Impact & Process Evaluation of 2009 (PY2) Ameren Illinois Utilities Commercial and Industrial Electric Energy Efficiency Programs

Final

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TABLE OF CONTENTS

TABLE OF TABLES

TABLE OF FIGURES

1. EXECUTIVE SUMMARY

This report presents results from the evaluation of the second program year of the Ameren Illinois Act On Energy Business Incentive Programs for electric energy efficiency. For Program Year (PY) 2 (2009), the portfolio of business programs included the Prescriptive and Custom, as well as the Retro-Commissioning and Demand Response programs.

Ameren Illinois exceeded its planned Program Year 2 demand targets for the commercial and industrial portfolio, but fell short of its planned energy savings goal.[1] As shown in Table 1, some programs exceeded planned goals for both kW and MWh while others did not.

Table 1. C&I Portfolio Net Impacts

Program	2009 Planned Impacts[a]		2009 Ex Post Net Impacts (Prospective)[b]		2009 Ex Post Net Impacts (Retrospective)	
	kW	MWh	kW	MWh	kW	MWh
Ameren Illinois Utilities Contribution to C&I Portfolio						
C&I Prescriptive	14,965	63,182	7,064	33,028	8,903	41,608
C&I Custom	1,952	15,012	36,573	22,062	32,773	19,770
C&I Retro-Commissioning	30	1,230	1,222	10,890	977	8,712
Commercial New Construction[c]	33	102	-	-	-	-
Commercial Demand Response/ Demand Credit[d]	4,642	93	-	231	-	231
Street Light	-	4,249	-	-	-	-
Total	**21,621**	**83,868**	**44,859**	**66,210**	**42,654**	**70,320**

Note: The Ameren Illinois portfolio of ex post impacts are at the 90 percent certainty level with a 4.3% relative precision (90±5.8%). There are no ex post impacts for the Street Light and Demand Credit Programs as they were inactive during Program Year 2. However, Demand Credit was replaced by the Demand Response Program and Commercial New Construction was implemented through the Custom Program. Impacts for the Small Business HVAC Program and Online Store are included under the C&I Prescriptive Program.

[a] From Energy Efficiency and Demand-Response Plan (Ameren Illinois Utilities), November 15, 2007, Table 12. Values are rounded.

[b] Prospective indicates that the evaluation team applied the NTRGs estimated in 2008 (PY1) as opposed to Retrospective where we applied the NTGRs estimated for PY2.

[c] Ex post net savings for this program are included within the C&I Custom Program.

[d] The Demand Credit and Demand Response programs are listed together given the replacement of the former with the Demand Response Program. In addition, while the program had a total controllable load of 893 kW per event, Ameren Illinois did not call an event in PY2.

[1] Ameren Illinois has kWh reductions to meet statutory requirements, but the statutory requirements for kW impacts are based on demand-response programs, not energy efficiency programs.

The following table provides a summary of the 2009 C&I Portfolio ex ante gross impacts compared to ex post net impacts by program.

Table 2. C&I Portfolio Ex Ante Gross and Ex Post Net Impacts

Program	2009 Ex Ante Gross Impacts		2009 Ex Post Net Impacts		Realization Rate[a]	
	kW	MWh	kW	MWh	kW	MWh
C&I Prescriptive	11,738	56,359	8,903	41,608	0.76	0.74
C&I Custom	68,680	33,392	32,773	19,770	0.48	0.59
C&I Retro-Commissioning	1,236	12,640	977	8,712	0.79	0.69
Commercial New Construction	-	-	-	-	-	-
Commercial Demand Response/ Demand Credit[b]	-	300	-	231	-	0.77
Street Light	-	-	-	-	-	-
Total	**81,654**	**102,691**	**42,654**	**70,320**	**0.52**	**0.68**

Note: Impacts for the Small Business HVAC Program and Online Store are included under the C&I Prescriptive Program.

a Realization Rate=Ex Post Value/Ex Ante Value.

b The Demand Credit and Demand Response programs are listed together given the replacement of the former with the Demand Response Program.

As in PY1, the AIB program tracking database was easy to use and essential to our impact assessment. In addition, the Technical Reference Manual (TRM) continued to serve as a key tool for the evaluation. As part of our TRM review, we assessed the document's new information and found that there are a couple of areas where Ameren Illinois could make changes related to HVAC, lighting, and motor measures.

Based on our assessment of impacts, we make the following recommendations:

- Update the TRM:
  - Continue efforts to develop a TRM measure write-up for non-HVAC applications of VFDs.
  - Review measure baselines for possible improvements due to recent and pending upgrades to state codes and federal standards affecting efficient motors, lighting, and HVAC.
  - Review and potentially update select motors and HVAC impacts.
- Update AIB to include additional information for retro-commissioning projects such as whether ex ante savings estimates are estimated or verified.

Process Evaluation

Customer satisfaction with the Prescriptive and the Custom programs remains high. Participants in both programs give virtually all program components high satisfaction scores,

including the application process, responsiveness and technical ability of program staff, the measures offered, the incentive amount, and the program and Ameren Illinois overall. In addition, the Retro-Commissioning Program's Retro-Commissioning Service Providers (RSPs) report that their customers appear satisfied with the program.

The Prescriptive and the Custom programs also continue to experience high customer satisfaction with the contractors they work with and almost all participants would recommend them to others. However, a general lack of awareness related to the Program Ally Network has persisted and Ameren Illinois could reassess the importance of its promotion in future program years.

Within the Retro-Commissioning Program, Ameren Illinois's quality assurance and verification procedures are generally sufficient to ensure quality projects. However, compared to the other programs in the Act On Energy Business portfolio, the number of quality assurance activities in place is low.

Key recommendations based on the process evaluation are as follows:

Prescriptive and Custom Programs

- Given that participants continue to be relatively unaware of the term "Program Ally" and unsure about whether they used one for their project or not, Ameren Illinois should explore the degree to which Program Allies use their affiliation with the program when reaching out to potential customers.
- If feasible, Ameren Illinois should also develop a strategy to raise awareness of Program Allies among their customers and demonstrate the value of this program component.
- Based on minimal non-participant familiarity with the programs, we recommend developing additional case studies and other marketing collateral aimed at providing detailed information to Ameren Illinois customers about the Act On Energy Business programs. These materials will help build upon relatively high awareness of the program among non-participants.

Retro-Commissioning Program

- Given the importance of quality assurance and control, Retro-Commissioning Program staff should document the protocol for SAIC inspection of RSP work. In addition, program staff should consider expanding the number of SAIC inspections performed each program year.
- Program staff should continue to consider ways to encourage greater RSP participation in the program.
- Ameren Illinois should consider ways to educate Retro-Commissioning participants about their program responsibilities. Ensure that participating customers, as well as RSPs, are aware that outside verification of projects is a possibility.

Small Business HVAC

- Program staff should work with Small Business HVAC trade allies in PY3 to identify additional marketing tools that would help them reach small customers targeted by the program.
- To the extent possible, program staff may want to consider simplifying the program's incentive structure so that a set amount is offered for each type of equipment.

2. INTRODUCTION

This report presents results from the evaluation of the second program year of the Ameren Illinois Act On Energy Business Incentive Programs for electric energy efficiency. For Program Year (PY) 2 (2009), the portfolio of business programs included the Prescriptive and Custom, as well as the Retro-Commissioning and Demand Response programs.

Three programs included in the originally filed plan are not identified in this report. The C&I New Construction Program was implemented as part of the Custom Program instead of as a standalone program. The Commercial Demand Credit Program was replaced by the Commercial Demand Response Program. In addition, implementation of the Street Lighting Program is no longer planned at any time.

The following sections cover the PY2 process and impact results from the C&I Prescriptive, Custom, and Retro-Commissioning Programs. Process findings related to the Small Business HVAC Program are also included as are high-level observations related to the Demand Response Program.

To support the evaluation, we conducted qualitative research including a review of program materials and interviews with program administrators, implementation staff, Ameren Illinois Key Account Executives, Small Business HVAC trade allies, and an engineering desk review of projects. Our quantitative research efforts included a survey of non-participating customers in two of Ameren Illinois's smaller rate classes (DS2, DS3a and DS3b), surveys with an attempted census of customers who participated in the Custom Program, and a random sample of those who participated in the Prescriptive program. In addition, we conducted Net-to-Gross (NTG) related interviews with Retro-Commissioning Program participants.

2.1 Program Descriptions

The Prescriptive and Custom Incentive Programs offered by Ameren Illinois are designed to overcome barriers related to cost, awareness/information, transaction cost, and resistance to the adoption of new, more energy-efficient technologies. The cost of energy efficiency improvements is addressed through the incentives offered by the program; awareness by the recruitment of program allies and the establishment of a formal program ally network; and the development of program materials, including applications, that are easy to understand and complete. Those involved in program design foresee the use of case studies and press releases as a mechanism to convince potential participants of the benefit associated with removing inefficient equipment even if it is still functional.

Ameren Illinois's Retro-Commissioning Program is designed to overcome barriers related to the identification of retro-commissioning opportunities and the internal approval process. The discovery of retro-commissioning opportunities is addressed through the retro-commissioning survey performed at a customer's facility, and the incentive provided for the study is intended to overcome the approval hurdle. In addition, covering less than 100% of the survey cost helps to ensure customer commitment and buy-in for the project.

Ameren Illinois developed the Small Business HVAC program to address specific barriers to taking energy efficient actions among smaller customers. In particular, given that HVAC equipment is typically replaced on failure, substantial incentives may be required to entice a facility to upgrade before then, particularly smaller companies with fewer financial resources. Additionally, businesses may not regularly tune up their HVAC equipment or know about the benefits of doing so. As a result, the program's outreach and incentives educate smaller customers about the importance of maintenance given the often limited customer staff and the lack of customer time to explore energy efficiency upgrade opportunities.

2.1.1 C&I Prescriptive Incentive Program

The C&I Prescriptive Incentive program offers Ameren Illinois commercial and industrial customers fixed incentives for the installation of specific energy efficiency measures. The program covers lighting, HVAC, and refrigeration equipment as well as motors. As a result of the Prescriptive Program oversubscription in PY1, all PY2 projects required pre-approval. Participants must also compile and present documentation of project completion through the final application process.

Ameren Illinois offered a number of special promotions during PY2 including a bonus incentive for T-12 replacement and the promotion of Variable Frequency Drive (VFD) measures from January through May. For smaller customers, the Online Store was also fully operational in PY2 and a special increased incentive of 50% was offered to encourage greater customer participation.

2.1.2 C&I Custom Incentive Program

The C&I Custom Incentive program allows Ameren Illinois commercial and industrial customers to complete energy efficiency projects that involve equipment not covered through the prescriptive program. The option to propose additional measures allows customers to tailor projects to their facility and equipment needs. Similar to the prescriptive program, custom incentives are available for lighting, HVAC, refrigeration, and motors. In addition, participants can also implement projects related to measures such as compressed air, drives, and industrial processes. However, Ameren Illinois evaluates incentive applications using criteria such as payback period. In addition, as in PY1, all customers must get pre-approval for their energy efficiency projects and provide documentation and calculations of estimated energy savings when submitting their final application for payment.

2.1.3 C&I Retro-Commissioning Program

Retro-commissioning is the process of inspecting and testing existing operating equipment to ensure that it delivers the services required by end-users, under the expected conditions and for the least cost. Typically, retro-commissioning examines the operations and maintenance of equipment and how it affects energy use; therefore, corrective actions are generally low cost to implement. When more costly measures are identified, they are frequently flagged for future consideration and analysis.

Under the Retro-Commissioning Program, Ameren Illinois shares the cost of a facility study with customers interested in identifying low cost and no cost retro-commissioning

opportunities in the areas of compressed air and healthcare. The level of cost-sharing by Ameren Illinois ranges from 50-80% depending on the cost-effectiveness of the potential project and the level of expected energy savings. Upon completion of the facility study and agreement on an implementation plan, the participating customer is responsible for implementing the agreed upon retro-commissioning measures or repairs. Both compressed air and healthcare projects were completed in PY2.

Retro-commissioning Service Providers (RSPs) are the main program delivery channel for PY2. In general, participants can choose from a list of approved RSPs included in the program application. According to program staff, most customers already have a relationship with one of the RSPs affiliated with the program. They do not typically have to match the two parties, but they will if necessary.

2.1.4 Small Business HVAC Program

The Small Business HVAC program offers prescriptive incentives for tune-ups of HVAC equipment, including air conditioners, gas boilers, and gas furnaces to Ameren Illinois small commercial customers. In addition, the program provides incentives for the replacement of gas boilers and gas furnaces with energy efficient models. The program requires pre-approval before work begins, as well as documentation of project completion through the final application process. Customers may obtain incentives for electric savings and/or gas savings through the program. This evaluation effort encompasses the electric savings as the gas savings are included within a separate study.

2.1.5 Demand Control Program

In PY2, Ameren Illinois implemented the Commercial Demand Control Thermostat Program in place of the previously planned Demand Credit Program. Through this program, eligible small business customers received a Comverge SuperStat Programmable Thermostat that cycles the customer's AC unit upon receipt of an Ameren Illinois signal during peak demand periods. The program, which focused on Peoria, Champaign-Urbana, and Metro East in PY2, was available only to customers in rate classes BGS-2, BGS-3A, RTP-2, or RTP-3A. The program offered thermostats alone and also as part of a special offering with furnace tune-ups.

2.2 Evaluation Questions

The overall evaluation objectives are to:

1. Consider and analyze demand-side management and energy efficiency measures and document the gross and net energy and demand savings associated with the Act On Energy Business portfolio.
2. Provide verification and due diligence of project savings as reported by the program implementer.
3. Suggest improvements to the design and implementation of existing and future programs through process evaluations.

4. Support Ameren Illinois in developing a best-of-class evaluation infrastructure for the Act On Energy Business portfolio.

All assessment activities tie directly to one or more of these objectives.

2.3 Format of Report

We provide the methods and findings for the C&I Custom and Prescriptive programs first, followed by the Retro-Commissioning Program and then the Small Business HVAC program. Appendices provide data collection instruments, engineering details, detailed due diligence, and verification findings for the Retro-Commissioning Program, and additional supporting documentation.

3. C&I PRESCRIPTIVE AND CUSTOM

3.1 Evaluation Methods

3.1.1 Data Sources and Analytical Methods

The assessment of the second program year of Ameren Illinois C&I programs included both process and impact analyses.

Process Analysis

The process analysis used data from three data collection methods: in-depth interviews, structured quantitative telephone surveys, and review of secondary data. In-depth interviews provided the evaluation team with a comprehensive understanding of the program. We performed in-depth interviews with one program manager and two implementation contractors. Additionally, we fielded three Computer Aided Telephone Interview (CATI) surveys, one to prescriptive participants, one to custom participants, and the third to non-participating nonresidential customers. Secondary data received from the utility and in-depth interviews provided context for the report while the CATI surveys were analyzed using descriptive statistics.

Task 4 – Technical Reference Manual Review

We conducted a technical review of the Ameren Illinois Act On Energy Technical Reference Manual (TRM) that was updated from PY1[2] to PY2[3]. We focused our review on the measures that were newly added for PY2, but we also comment on the substantial revisions to other measures and sections. We assessed the reasonableness of underlying algorithms, technology assumptions, and calculated savings values. The types of issues we considered in our review include:

Measure definition. Provides a description of the efficient technology, the required technology performance specifications, and the applications where the technology is eligible. There must be consistency between the TRM and the participant application form (official program rules) to ensure the default savings occur.

Measure Savings Engineering Analysis. Provides the algorithms used to calculate non-coincident demand reduction, coincident demand reduction, and annual energy savings for each measure.

Measure Savings Assumptions. Documents the wattages, efficiency ratings, and operating assumptions for baseline and efficient equipment to calculate non-coincident demand reduction, coincident demand reduction, and annual energy savings.

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[2] PY1 version: Act On Energy Business Program-Program Year 1, June 2008 through May 2009, Technical Reference Manual (TRM), No. 2008-1, dated February 3, 2009.

[3] PY2 version: Act On Energy Business Program-Program Year 2, June 2009 through May 2010, Technical Reference Manual (TRM), No. 2009-1, dated December 15, 2009.

Measure Savings Results. Presents the default values that are derived from the algorithms and assumptions. Potential issues include:

- Has the calculation been correctly performed to generate the default values (are there math errors)?
- Is the weighting or averaging of data to derive a single default value reasonable?
- Do individual default values cover too broad of a range?
- Are the units for the savings correct and clearly presented?

Results are summarized in Section 3.2.3.

Impact Analysis

The impact analysis used data from the quantitative telephone surveys, project files, and on-site audits. Telephone survey data supported both the gross and net analysis, while the project files and onsite audits were instrumental in the gross impact analysis.

Gross Impacts

Engineering Review and Modeling

The prescriptive component of the C&I program used engineering review and modeling to determine gross impacts. We reviewed written documentation around ex ante impacts and assessed whether the inputs were reasonable and in line with standard practice. More specifically, we performed an engineering review of the TRM for measures that have been newly added in PY2 through the programs. Engineering modeling occurs when calculations of energy and/or demand impacts occur within a spreadsheet. These were straightforward calculations using data collected through the CATI survey. For the estimated energy impacts, engineers used the information from the telephone surveys and the program tracking database (AIB) to verify installation values and adjust project-specific information, if needed. This was a careful review that varied by each end use.

On-Site Audits

The custom component of the C&I program used engineering review, modeling, and on-site audits to determine gross impacts. Overall, we reviewed a total of 50 custom projects. The evaluation plan included engineering review and on-site visits for 40 projects. However, the evaluation team added engineering reviews for an additional 10 projects given the final composition of the Custom participant population. For the sample of sites, the team reviewed written documentation, assessed whether the inputs were reasonable and in line with standard practice, created engineering models where needed, and verified specific parameters with on-site audits. We applied the realization rate (i.e., ex post kWh/ex ante kWh) from the audited sites to the participant population ex ante impacts to obtain program level gross impacts for the custom projects.

Net Impacts

The goal of the net impact analysis is to determine each program's net effect on participating customers' electricity usage. After gross program impacts have been assessed, net program impacts are derived by estimating a Net-to-Gross Ratio (NTGR). This NTGR is based on self-reported information from the CATI surveys that quantifies the percentage of the gross program impacts that can reliably be attributed to the program. As in PY1, NTGRs were calculated based on both the level of free-ridership and participant spillover. In addition, the PY2 evaluation developed NTG factors for the Prescriptive Program and the Custom Program separately. As part of the PY2 evaluation, we assessed the potential presence of non-participant spillover to determine if it should be fully explored in PY3.

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 both prescriptive and custom 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.[4]

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. The second question asked if they had learned about the program before or after they decided to implement the energy efficient equipment rather than standard efficiency equipment. This score is equal to the number of points given to the program divided by 10. If respondents learned about the program *after* deciding to install energy efficient equipment, that value was halved. Greater importance of the program means lower level of free-ridership.

2. **Influence of program components.** This score is based on a series of five questions. These questions asked respondents to rate the importance of five program components, on a scale of 0 to 10 (where 0 is not at all important and 10 is very important): the incentive amount, program marketing materials, recommendation from program staff, recommendation from a utility account manager, and the opportunity assessment. 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.

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

[4] 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.

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.

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.[5] There were seven Standard Rigor NTG projects in PY2. Two different analysts assessed the data from these projects, including findings from in-depth interviews with trade allies, and arrived at independent NTG values. After a discussion of the values, the analysts reached an agreement for each project. Overall, the NTG score for one project increased by 0.1 and all others remained the same.

An NTGR, weighted by the ex post kWh of the surveyed projects, was applied to the population gross impact to obtain a net impact of the program before any spillover was included.

Participant Spillover

Participant spillover refers to energy efficiency installations that were influenced by the program but did not receive an incentive. An example of participant spillover is a customer who installed incented equipment in one facility and, as a result of the positive experience, installs additional equipment at other facilities but does not request an incentive or perform additional efficiency related actions in the same facility because of the program.

Spillover was examined in projects of all end uses using participant responses to the phone survey. Based on this data, spillover was not found among Prescriptive or Custom program participants in the Ameren Illinois service territory. However, there were seven prescriptive lighting projects that did provide survey responses suggesting spillover may have occurred, but other data provided by the respondents conflicted with these responses or failed to confirm that spillover occurred.

Non-Participant Spillover

As part of the PY2 evaluation effort, we assessed the potential presence of non-participant spillover. Non-participant spillover refers to energy efficiency installations that were influenced by a customer's knowledge of the Act On Energy Program, but did not receive an incentive. We examined spillover using responses to the non-participant telephone survey and found that there were two decision-makers that took action and attributed it to the program suggesting spillover may have occurred. In both cases, the respondents installed

[5] Projects with estimated ex ante kWh savings of 600,000 kWh or more were assessed under this Standard rigor approach.

energy efficient lighting equipment outside of the program. Additional explanation of our findings in this area is included in Section 3.1.2.

3.1.2 Sampling and Survey Completes

CATI Telephone Surveys

The evaluation team implemented CATI telephone surveys with Prescriptive and Custom program participants, as well as Ameren Illinois non-participating business customers. The sample of participant projects for the prescriptive and custom programs was selected from data in the Ameren Illinois tracking system extract from June 10, 2010.[6] The evaluation team drew the non-participant sample from customer account data provided by Ameren Illinois on May 28, 2010. The following sections outline the sampling approach used for each survey effort.

C&I Prescriptive Incentive Program

We conducted the prescriptive participant survey using a stratified random sampling approach. The survey collected data to support the process evaluation and to estimate net program impacts. The survey was fielded during July and August 2010.

There were two sample frames constructed—one for prescriptive participants and the other for custom participants. Due to the magnitude of the number of projects in the Prescriptive and Custom programs, and the level of savings in the prescriptive sample frame, all customers in both frames were taken out of the prescriptive frame and placed in the custom frame.

Regardless of the sample frame, sampling for the participant survey was conducted at the level of the project contact, rather than the project. This was necessary because many customers completed more than one project in PY2. These businesses generally submitted the same contact name for the different projects. To avoid a burden on the respondent, each contact was only asked about one project. In sum, a total of 414 unique customer contacts submitted prescriptive projects in PY2, and the sample design was based on these 414 contacts.

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. We used the following order to reassign participants to a non-lighting end use: refrigeration, motors, HVAC, and grocery. This order is set by the percent of kWh expected by each end use. Therefore, priority is given to the end use with higher expected savings. This approach was intended to ensure that our sample would include a sufficient number of non-lighting projects, since lighting was the predominant end use in PY2.

[6] In August 2010, a change was made to the population data to reflect that six projects were not actually completed in PY2.

The resulting sample of contacts/projects was then divided into lighting and non-lighting projects. We obtained better precision on the lighting projects by stratifying according to expected energy savings. The sample of lighting projects was further stratified as follows: small savings—less than 75,000 kWh, and large savings—greater than 75,000 kWh. This stratification was done using the Delanius-Hodges method to determine strata boundaries and the Neyman allocation to determine the optimal allocation of the available interviews to the strata. The following table outlines the stratification scheme implemented for this program.

Table 3. Sample Design for C&I Prescriptive Survey—Lighting Only

Sampling Strata	KWh Savings Range	Number of Projects	Target Interviews	Completed Surveys*
Small Lighting	0 - 75,000	303	25	25
Large Lighting	75,001 – 2,500,000	78	Census attempt	32
TOTAL		**381**		**57**

*A number of projects ultimately not completed in PY2 were part of the sample frame and did complete interviews (1 within small lighting and 3 within large lighting). However, they are not presented here or included in our analysis.)

The purpose of stratifying the sample of lighting projects was to ensure that the projects about which we asked the customers represented a sufficiently large proportion of lighting savings, so that savings-related survey 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 conducted an attempted census of the large projects and a random sample of the small-size projects. For non-lighting projects, we also attempted a census. The following table presents the population values and completed survey information for the prescriptive program.

Table 4. Completed Prescriptive Survey Points

End-Use	AIB Population[a]	Sample Frame Population		Completed Surveys	Completed Survey MWh Savings
	Projects	Contacts	Projects		
Lighting	636	372	539	57	6,181
Motors	27	19	21	10	3,957
HVAC	24	15	18	8	405
Refrigeration	21	6	20	3	388
Grocery	13	2	2	2	9
Total	*721*	*414*	*600*	*80*	*10,939*

Note: Project counts in the Sample Frame Population differ from those in the AIB population due to contacts with multiple projects. We assigned each unique contact into the Sample Frame Population for either the Prescriptive or the Custom Program, thus decreasing the possible number of projects in a few specific sample frames. In total, 104 project contacts were moved to the Custom Program survey sample.

[a] The total number of projects listed reflects the population in AIB as of June 2010. The final population of projects changed after the date of this extract and is reflected elsewhere in the report.

This sample design provides statistically valid impact results at the 90% confidence level +/- 3% error for the prescriptive lighting projects on a kWh basis. For all other project types, we attempted a census and, therefore, there is no sampling error. In terms of the process analysis, final results are representative of the population with a confidence of 90% and a precision level of 10% for a proportion.

Sample Weights

The process analysis looks at each decision maker equally. Since the sample design involved over-sampling of large lighting and non-lighting projects, sample weights were applied to report results for all survey respondents. Sample weights were calculated by dividing the population proportion by the sample proportion for each sample stratum. The weights for the telephone survey data are shown in Table 5.

Table 5. Sample Weights for C&I Prescriptive Survey

Project End-Use	Prescriptive Population	Un-weighted Survey	Weight
Small lighting	69%	31%	2.20
Large lighting	21%	40%	0.52
Non-lighting	11%	29%	0.38

C&I Custom Incentive Program

We attempted to complete a telephone survey with all decision makers in the Custom Program. Duplicate contact names were removed from the sample where a single person was involved in more than one project application. In addition, as in the prescriptive sample, we asked participants about only one project and selected the project with the highest kWh

savings. The following table presents the population values and completed survey information for the Custom Program.

Table 6. Completed Custom Survey Points

End-Use	AIB Population[a]	Sample Frame Population		Completed Surveys*	Completed Survey MWh Savings
	Projects	Contacts	Projects		
Lighting	100	67	100	33	2,954
HVAC	22	15	22	7	2,672
Compressed Air	23	20	23	5	3,976
Refrigeration	2	2	2	1	125
Motors	4	2	4	1	54
Geothermal	1	1	1	1	878
Industrial Process	4	2	4	1	183
Drives	9	2	9	0	0
Miscellaneous	39	8	35	2	117
Total	*204*	*119*	*200*	*51*	*10,959*

Note: Project counts in the Sample Frame Population differ from those in the AIB population due to contacts with multiple projects. We assigned each unique contact into the Sample Frame Population for either the Prescriptive or the Custom Program, thus decreasing the possible number of projects in a few specific sample frames.

[a] The total number of projects listed reflects the population in AIB as of June 2010. The final population of projects changed after the date of this extract and is reflected elsewhere in the report.

The survey was used to verify the installation of the program measure, gather data to support the estimation of the NTGR, and collect other information useful for the process evaluation. As we attempted to gather data from a census of program participants installing custom measures, the questions regarding the NTGR have no sampling error; therefore, no confidence intervals are applied to the NTGR (i.e., no precision values).

The evaluation team concluded that an un-weighted analysis for the Custom Program 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.

C&I Non-Participants

We conducted a CATI telephone survey with a random sample of 130 non-participants in two of Ameren Illinois's smaller rate classes (DS2, DS3a and DS3b). We chose to conduct interviews with these customers to find out more about them and therefore how to better target them. The evaluation team thought research with this group was particularly beneficial given that in the past, program participation has been common among larger customer groups.

This survey focused on equipment installation practices, energy efficiency knowledge, program awareness, perceived benefits and barriers to participation, marketing and

outreach, and non-participant spillover (discussed below). The results of the survey are used to support our process evaluation.

Table 7. Non-Participant Survey Summary

Rate Class	Population	Sample Frame	Completed Surveys
DS2	44,471	1,400	64
DS3 (a & b)	1,143	1,143	66
Total	*45,614*	*2,543*	*130*

After reviewing the survey data, the evaluation team concluded that an un-weighted analysis for the non-participants provided the best representation for process results. The analysis largely features the reporting of response frequencies, and we decided to give equal weight to each response.

Non-Participant Spillover

As described in the Evaluation Methods section, we examined spillover using responses to the non-participant telephone survey and found that there were two decision-makers that took action and attributed it to the Act On Energy Business Program. In both cases, the respondents installed energy efficient lighting equipment outside of the program. These two respondents demonstrate there is the potential for 2% of non-participating customers in the DS2 and DS3 rate classes to take similar action outside of the program.

To provide a rough idea of the impact this could have on future evaluation efforts, the team looked at the average kWh savings from lighting projects, assuming that smaller companies might save 25% of this amount given the presence of large projects within the PY2 participant population. We multiplied this kWh value by the 2% of the non-participant population (702 customers), and applied that amount to this year's evaluation findings. The result is that non-participant spillover could increase the Prescriptive Program's NTGR from 0.76 to 0.99. Therefore, we believe this is an important area of research to discuss with Ameren Illinois and pursue in PY3.

On-Site Verification

Energy and demand impacts associated with the Custom Program were determined based on on-site audits, as well as detailed engineering desk review of completed projects discussed below. The sample of participant projects for these activities was selected from data in the Ameren Illinois tracking system extract from June 10, 2010.

C&I Custom Incentive Program

The custom evaluation plan called for a sample of 40 projects to be selected for engineering review and site verification. We chose the sample using a stratified random sample design. For the stratification, we used the Delanius-Hodges method to determine strata boundaries and the Neyman allocation to determine the optimal allocation of the available interviews to the strata. We also drew the sample in two waves to ensure a sufficient percentage of the savings from the program was assessed.

This phased approach to sampling allows site work to begin earlier in the program year. However, it poses challenges given that the majority of projects are often completed in the second half of the year and these projects can have a different savings profile. In this case, the evaluation team determined that it should complete 15 more desk reviews in addition to the on-site visits. This way, we would capture a sufficiently large proportion of program savings with the goal of being 90% confident that our sample mean was within 10% of the population mean.

The following table shows the sample selected in both waves, including the desk review component. The 55 sites with on-site verification and desk review account for 41% of ex ante[7] savings.

Table 8. Two-Wave Custom Site Visit Sampling Approach

Sampling Strata	KWh Savings Range	Number of Projects	Site Visits/ Desk Review
Wave 1			
1	0 – 50,000	17	2
2	50,001 – 250,000	25	11
3	250,001 – 800,000	7	7
Wave 2			
1	0 – 100,000	102	20
2	100,001 – 600,000	34	9
3	600,001 – 1,900,000	16	6
TOTAL		**201**	**55**

The final sample design provides statistically valid impact results at the 90% confidence level +/- 13% on a kWh basis for the Custom Program overall. The confidence interval (error) is larger than desired due to the variation in energy savings within the two waves, but is the best possible given the need to conduct a phased analysis.

[7] Ex ante savings are estimates of savings in the utility tracking system or what the utility believed they had saved prior to the evaluation.

3.2 Results and Findings

3.2.1 Process Results

Consistent with the PY1 report, research results and findings for the Prescriptive and Custom programs will be presented together for PY2. In PY2, in addition to surveys conducted among participants of the Prescriptive and Custom programs, an additional study was conducted among Ameren Illinois non-participating customers, specifically those within the DS2 and DS3 rate codes as outlined in Section 3.1.2. Findings from this study, though not representative of the entire non-participant population in the Ameren Illinois service territory, provide a clear indication of trends and market dynamics.[8] Results from the non-participant study supplement, where relevant, the results of the participant surveys to more accurately depict market tendencies, program awareness, barriers and motivators to program participation.

Program Challenges

One challenge identified as part of the evaluation research is a relative shortage of marketing and outreach personnel. Many similar programs have a one-to-one ratio of marketing staff to engineers, but for the Act On Energy program, this ratio is one-to-seven. Despite the limited personnel resources, the amount of marketing and outreach activities in PY2, as well as their depth, is commendable. The program marketing staff, though somewhat pressed for resources, identified and took advantage of valuable marketing opportunities and successfully used a range of targeting techniques to promote the program. In addition, engineering staff help to support marketing and outreach for the programs. We further discuss marketing in the Program Awareness section.

Utility and Implementer Interaction

Despite some personnel changes, successful collaboration between Ameren Illinois and the Act On Energy program implementation partners continued in PY2. Communication and information sharing tools and strategies appear to be effective in keeping all parties up-to-date on the program news and helping resolve any issues in a timely manner.

Program Participation

Participating Customers

Between PY1 and PY2, participation in both programs nearly tripled in terms of the overall number of projects completed, as well as the number of unique participants. In particular, in our interviews with program staff, nearly all noted that participation was stronger than expected for the Custom Program. Table 9 below provides an overview of program activity across the two program years.

[8] While the results of the non-participant survey cannot be extrapolated onto the entire non-participant population, for the ease of reporting, this group will be generally referred to as "non-participants" throughout this and other sections of the report.

Table 9. Overview of Program Participation across Program Years

Program	PY1		PY2	
	Total Projects	Unique Contacts	Total Projects	Unique Contacts
Prescriptive Program Total[a]	***246***	***148***	***721***	***469***
Lighting	191	134	636	420
Motors	3	3	27	20
HVAC	7	6	24	19
Refrigeration	45	5	21	6
Grocery	0	0	13	4
Custom Program[b]	***68***	***35***	***204***	***119***
Lighting	32	10	100	67
HVAC	2	2	22	15
Compressed Air	13	10	23	20
Refrigeration	1	1	2	2
Motors	6	3	4	2
Geothermal	1	1	1	1
Industrial Process	1	1	4	2
Drives	2	2	9	2
Miscellaneous[c]	7	4	39	8

Source: AIB extract as of June 10, 2010 including additional August updates.

[a] In PY1, the Prescriptive program includes projects completed under the Standard Revised program.

[b] Please note that for 3 projects within the PY1 Custom Program, there is no measure detail available; therefore, a sum of projects by end-use will not equal the total number of PY1 Custom projects completed.

[c] Includes projects with multiple end uses.

The composition of the participant population remained largely unchanged: the majority of Prescriptive and Custom participants operate in the manufacturing and industrial (Prescriptive – 16%, Custom – 26%), retail and service (Prescriptive – 14%, Custom – 22%), and warehouse and distribution sectors (Prescriptive – 12%, Custom – 2%). Additionally, 12% of the Custom program participants operate in the grocery sector, while 17% of the Prescriptive program participants are nonprofit organizations. The facility type in which the equipment was installed is largely the same as the business sector in which the company operates.

As in PY1, the large majority of PY2 participants own and occupy their facility (Prescriptive – 87%, Custom – 88%) and nearly all are responsible for handling their utility bills (Prescriptive – 97%, Custom – 100%). There is also a good mix of company sizes, although the Custom Program continues to attract larger companies, with more locations and more personnel. The average number of employees at the companies participating in the Custom Program is 184, while for the Prescriptive program it is 91. At the same time, 55% of the Prescriptive program participants are companies with one location, compared to 35% of the Custom program participants who say the same.

Program Allies

In PY2, the Act On Energy Business program staff continued expanding its program ally base. The number of registered program allies increased from 184 in PY1 to 393 at the end of PY2.[9] Allies registered with the Act On Energy Business program cater to a variety of market segments and provide a full breadth of services. In PY2, nearly three-quarters of all projects, both custom and prescriptive, were submitted by registered program allies. However, despite the growing ally network, a few program allies continue to be responsible for a large number of projects. Out of the network of 393 registered program allies, 185 completed at least one project incentivized through the Act On Energy Business program in PY2. Furthermore, 36 program allies completed a total 436 projects. This means that 9% of program allies have been responsible for supporting nearly half of the PY2 projects.

To address this issue, Ameren Illinois and its program partners utilized several strategies that they hoped would reduce the number of inactive allies and reward those who actively pursue new project leads and promote the program. The approach includes the following:

- Mandatory ally training. In PY2, to remain a registered program ally, all allies needed to complete a training webinar. Program allies who fail to do so are removed from the online database and do not qualify for marketing assistance and various promotional activities offered by Ameren Illinois.
- Prioritizing program allies. Program staff enhanced the online program ally database with the addition of a weighting mechanism that ranks registered program allies based on their activity within the program. More active program allies are moved up the list, while inactive ones are pushed down.

These enhancements, along with various promotional offers, educational activities, and marketing support, are positive steps in the program's efforts toward building a stronger program ally network.

Non-Participant Profile

Non-participant respondents are represented primarily by the agricultural (17%), office (15%) and retail (12%) sectors. The rest of the sample is more or less evenly split between a variety of sectors, including medical, education, hospitality, and warehouse and distribution. Three-quarters (76%) of non-participants own and occupy their facilities, while 21% rent their facilities. Nearly all (98%) pay their electric bills. Since smaller customers of Ameren Illinois are overrepresented in the respondent sample, it is not surprising that most companies (59%) have only one location and 63% consider themselves a small company in comparison to other companies within their industry.

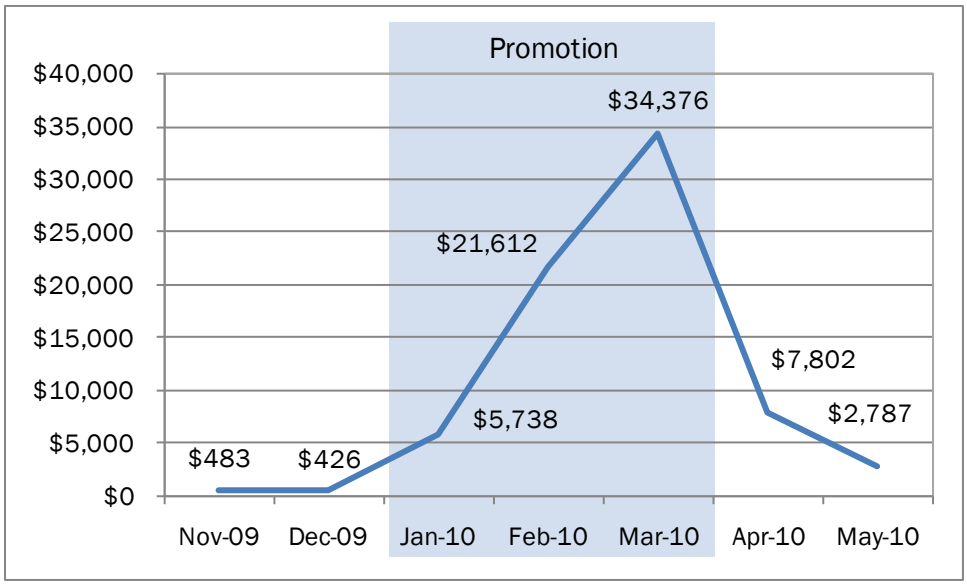
Online Store Impact on Participation

The online store launched at the end of PY1 to diversify the Act On Energy Business program's offerings and cater to small business customers (rate code DS2). The store is maintained by EFI and offers a range of lighting equipment, including CFLs, LED exit signs, and lighting controls. The performance goals set for the store in PY2 were 5 million net kWh

[9] The data are as of the AIB exported file provided to the evaluation team on June 10, 2010.

in savings and $70,000 in incentives. Due to low initial activity, Ameren Illinois launched a promotional effort offering free CFL kits along with a 50% discount on other online store products. This promotion ran from January 4, 2010 to March 31, 2010 and generated substantial activity among targeted participants. Figure 1 shows an increase in online store activity from November through May with the shaded area indicating the months when the promotion was offered.

Figure 1. Online Store Incentives Given out by Month



Source: Ameren Illinois Monthly Reports

Overall, the online store performed well in PY2 demonstrating a large increase in activity over PY1. Program staff are pleased with the store's performance in terms of both the incentives provided and the kWh achieved. While there are no firm goals for this component of the Prescriptive Program, the online store exceeded staff expectations related to general incentive goals, which were set around $70,000, but came in under its energy savings target of approximately 5 million kWh. In-depth interviews with the program manager indicated that this was the result of the multiple promotions and free giveaways offered in PY2, which altered the expected ratio of kWh to incentives. However, the promotional activities appear to have played an important role in generating awareness of the store, as post-promotion activity levels were higher than pre-promotion activity levels.

In terms of implementation, the program staff we interviewed praised EFI for flawless delivery of the online store and its offerings to customers as well as easy and convenient tracking and reporting procedures that EFI set up.

Program Awareness

Overview of Marketing and Outreach Activities

The far-reaching and non-centralized nature of the Ameren Illinois service territory has historically been a barrier to effective marketing and outreach activities given the difficulty of easily and cost-effectively reaching customers through mass marketing efforts. As a result, to reach its customers with messages about the Act On Energy Business programs, Ameren

Illinois and SAIC are using a more targeted approach to marketing and outreach. In PY2, the program focused its marketing and outreach efforts on the following areas:

- **Program ally communication and outreach**. This includes educational webinars and roundtables, periodic emails and newsletters, as well as co-branded marketing materials for use by program allies.
- **Outreach to past customers**. This includes email blasts promoting special energy efficiency offerings or incentives, as well as a customer newsletter with tips and tools on how to leverage the Act On Energy program to meet customers' business needs.
- **Outreach to Key Account Executives**. Program staff from Ameren Illinois and SAIC attended periodic meetings of the Key Account Executives, and present information on the new programs or offerings within existing programs.
- **Chamber of Commerce communications**. The program staff used this approach as a way to reach smaller (DS2 rate class) business customers. SAIC marketing representatives met individually with larger Chambers of Commerce to talk about the Act On Energy program and its benefits. Among other activities, Chambers of Commerce invite program representatives to speak at "lunch and learn" and roundtable events, and distribute periodic newsletters crafted by the Act On Energy program staff to Chamber of Commerce members at no cost.

To further understand the scope of PY2 marketing efforts, the evaluation team reviewed the materials produced, as well as detailed information collected by the program staff to track these activities. We then categorized the various types of outreach and found an impressive range of PY2 marketing activities both in terms of their reach and use of varied strategies.

Table 10. Summary of PY2 Outreach Activities*

Type of Outreach	PY2 Total
Press Releases and Media Events/Coverage	58
Chamber of Commerce Communications/Presentations	64
Program Ally Communications/Training	74
Customer Newsletter, Bill Inserts, and Email Blasts	33
External Presentations	57
Brochures	5
Program Allies requesting cobranded brochures	30
Internal Communications - KAE, etc	69
All Outreach Activities	390

*This table is meant to represent number of activities performed, not the number of customers reached for each type of outreach.

Included in the categories presented above are targeted marketing efforts. These include booths or a general presence at select events about the Custom and Prescriptive programs across the Ameren Illinois service territory, and in-person meetings between the SAIC marketing team and representatives from Ameren Illinois's top 50 accounts. Ameren Illinois also conducted a number of more traditional efforts: issuing press releases about the program to local newspapers, distributing program brochures and case studies, and

distributing targeted monthly or bi-monthly bill inserts and newsletters to select Ameren Illinois customers.

Many of these efforts helped contribute to earned media for the programs. In particular, there was press coverage of various Ameren Illinois Act On Energy Business program efforts, such as new lighting or HVAC offerings, as well as profiles of successful projects. A number of local newspapers such as the *Clinton Daily Journal*, *La Salle News Tribune*, *Peoria Journal Star*, and *Decatur Herald* publicized the programs. While the number of press releases and associated media coverage was the greatest from November 2009 through January 2010, the program staff maintained a fairly constant presence in the media throughout the program year.

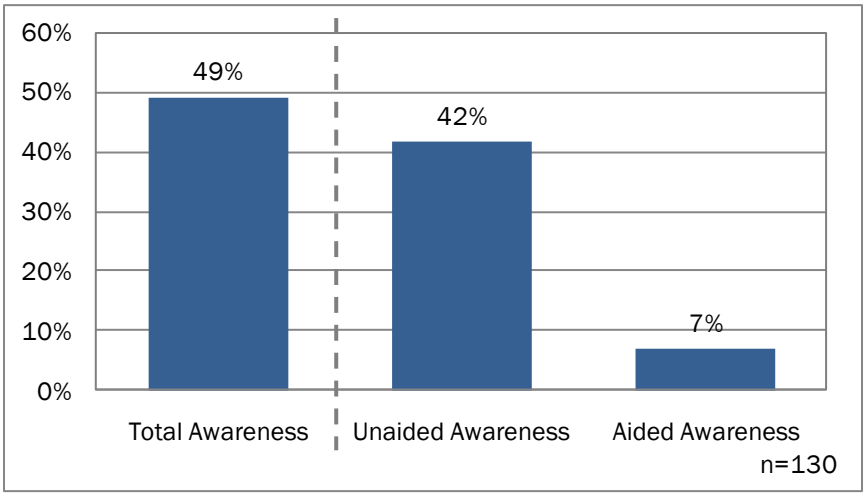
Program Outreach

The use of a variety of marketing and outreach mechanisms throughout the Program Year illustrates that Ameren Illinois is making great strides in promoting the program and its benefits, and most likely helped account for the three-fold increase in projects in PY2. In addition, although program awareness cannot be directly correlated with marketing and outreach activities conducted within the framework of the business program portfolio, research results suggest that the way that program participants and non-participants learned about the program corresponds to the program's primary marketing channels.

Program Awareness

Over half (54%) of non-participating customers are aware that Ameren Illinois offers programs to help their business customers save energy. In an unaided question asking about awareness of the Act On Energy program specifically, 42% say they were aware that the program existed. After being read a description of the program, an additional 7% of respondents say they were aware of the Act On Energy program, bringing the total percentage of non-participants aware of the program to 49%. This is noteworthy considering the nature of the Ameren Illinois service territory and the somewhat limited human resources available for program marketing and outreach.

Figure 2. Program Awareness among Non-Participants



Note: Aided awareness question was only asked of those who did not say "yes" to the unaided awareness question. Those respondents were brought

back into the base as a separate category to make the results comparable across the two questions.

While awareness of the Act On Energy Business program is fairly high among non-participants, familiarity with the program lags in comparison. This is somewhat expected given that non-participants generally do not have the level of interaction and exposure to the program as participants do. For example, less than half (43%) of non-participants say they are somewhat familiar with the program, and none say they were very familiar. This finding suggests that there is an opportunity for marketing efforts that provide more in-depth education about the program and showcase the benefits of installing energy efficiency equipment.

Customer Outreach

Prescriptive and Custom program participants along with non-participants learn about the program from a variety of sources. The key sources of program awareness are bill inserts, contractors, vendors, distributors, suppliers, Key Account Executives, and word of mouth. These sources are consistent with Act On Energy program marketing strategies in PY2.

Compared to PY1, email appears to be a more common source of information about the program among the Custom participants than the Prescriptive Program participants—16% of the Custom program participants first heard about the Act On Energy Business program via some sort of email communication, compared to only 2% of the Prescriptive Program participants. In addition, bill inserts are the top source of information about the program among non-participants.

Table 11. How Participants and Non-Participants First Hear about the Program

Information Source	PY1		PY2		Non-Participants (n=63)
	Prescriptive (n=17)	Custom (n=54)	Prescriptive (n=80)	Custom (n=51)	
Contractor/program ally[a]	24%	22%	25%	10%	2%
Vendor/Distributor/Supplier	24%	4%	14%	20%	--
Ameren Illinois website	12%	9%	5%	--	8%
Ameren Illinois Key Account Executive	6%	15%	9%	14%	3%
Bill insert	6%	11%	11%	8%	43%
Workshop	6%	6%	2%	--	3%
Email	6%	2%	2%	16%	5%
TV/Radio/Print	0%	2%	6%	8%	14%
Friend/colleague/word of mouth	--	11%	11%	8%	13%

Note: This table does not include an exhaustive list of responses provided by respondents, but rather focuses on the response categories most frequently mentioned by program participants and non-participants.

a This category also includes electricians that were mentioned as a separate response. Fifteen percent of Prescriptive program participants cited this group explicitly.

As frequency of marketing is thought to affect actions (i.e., more frequent marketing leads to a higher level of action), we also asked participants who recall receiving marketing materials about their perceptions of the level of program marketing. In particular, participants in the Custom Program report that they heard about the program with a good degree of frequency throughout the year. Nearly nine in ten (88%) Custom program participants and six in ten Prescriptive program participants (63%) heard about the Act On Energy Business program very or somewhat frequently throughout the year.

Recall and Usefulness of Marketing Materials

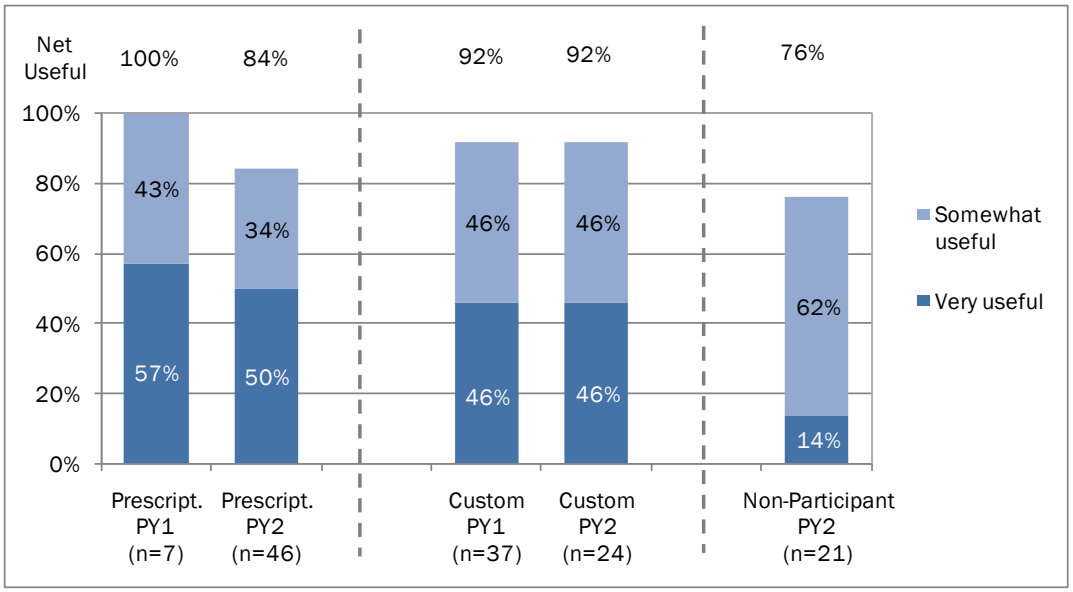
In general, Prescriptive program participants recall marketing materials to the same degree as in PY1 while Custom program participants are much less likely to recall materials compared with last year. As seen in Table 12, in PY2, 59% of Prescriptive program participants, 49% of Custom program participants, and 39% of non-participants recall seeing or receiving marketing materials for the Act On Energy Business program. In terms of the materials recalled, both participants and non-participants most frequently mentioned bill inserts, brochures, and emails. In PY2, Custom program participants are significantly more likely to recall receiving email communications (79%) than PY1 Custom program participants (47%). The same applies to Prescriptive program participants (38% and 34% for PY1 and PY2, respectively).

Table 12. Recall of Marketing Materials

Survey Respondent Group	% Recall seeing or receiving marketing materials about AOE program	
	PY1	PY2
Prescriptive program participants	50% *(n=16)*	59% *(n=79)*
Custom program participants	70% *(n=53)*	49% *(n=49)*
Non-participants	--	39% *(n=56)*

Overwhelmingly, program participants and non-participants find the information presented in the marketing materials useful. Improvements suggested by the handful of respondents who did not find the materials useful include simplifying the language and providing more detailed information.

Figure 3. Usefulness of Marketing Materials



Overall, research findings suggest that the marketing and outreach strategies employed by the program staff match the preferred communication methods mentioned by program participants and non-participants alike. When asked about the best way of reaching companies like theirs with information about energy efficiency opportunities, respondents in all groups mentioned direct mailings, emails, webinars, Key Account Executives, and program allies most frequently.

Table 13. Means of Outreach Preferred by Customers

Information Source	PY1		PY2		Non-Participants (n=127)
	Prescriptive (n=17)	Custom (n=56)	Prescriptive (n=78)	Custom (n=51)	
Flyers/ads/mailings	41%	21%	24%	24%	53%
Email	35%	43%	49%	51%	28%
Webinars/roundtables/ events	18%	5%	10%	--	2%
Bill inserts	12%	16%	21%	24%	39%
Key Account Executives	6%	14%	6%	10%	6%
Telephone	--	5%	21%	6%	17%
Trade/professional associations	--	5%	9%	4%	6%
Program allies/contractors	--	13%	12%	10%	4%
Other	6%	7%	3%	4%	7%

Program Allies and Contractors

As registered program allies and non-registered contractors continue to play a key role not only in promoting the program and its incentives to potential customers, but also in

specifying equipment and influencing customer decisions to install it, outreach to this group remains an important area of focus for the Act On Energy program marketing staff. In addition to the marketing efforts and support listed in the Overview of Marketing and Outreach Activities section, the program offered registered program allies an additional limited-time incentive for bringing projects into the program. For any project submitted during the month of February 2010, completed by the end of the Program Year and resulting in an incentive payout of $10,000 or greater, program allies were eligible to receive a $500 Visa gift card. According to the program staff, program allies submitted approximately 22 qualifying projects.

Program Processes

Participation Process and Requirements

The Act On Energy Custom and Prescriptive programs continue to maintain high levels of participant satisfaction in nearly all program areas—from program paperwork to processing incentives and addressing customer questions and concerns. Such consistency from one year to the next is commendable.

Project Specification and Identification of Incentive

Aside from program participants themselves, contractors continue to provide most of the assistance in developing the design and specifications of the equipment installed through the program. Thirty percent of the Prescriptive program participants and 21% of the Custom program participants name their contractor as the most influential person in specifying the details of their project. These numbers are largely unchanged from PY1. However, in PY2, an additional 20% of the Prescriptive program participants specifically identify electricians as the most influential in advising customers on project specifics (probably due to the very high number of lighting projects in PY2).

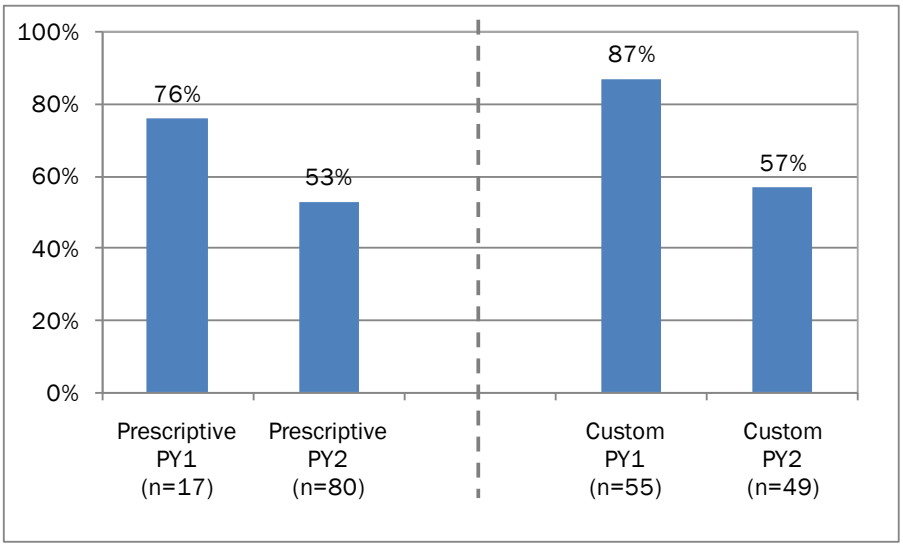
In PY2, contractors emerged as the key force in identifying the opportunity for Prescriptive program incentives.[10] The number of respondents who named contractors as the party responsible for introducing the idea of program incentives into planning discussions significantly increased from 18% in PY1 to 40% in PY2. Aside from contractors, Prescriptive program participants named themselves (26%), distributors (7%), Key Account Executives (6%), and program staff (8%) as identifying the opportunities for the Act On Energy program incentives.

Application Process

Significantly fewer customers submitted either the initial or final program application themselves in PY2. Instead, contractors and suppliers/vendors/distributors took care of submitting application forms for customers' projects.

[10] The question asking about the actors responsible for identifying program incentives was not asked of the Custom program participants in PY2.

Figure 4. Applications Submitted by Customers by Program by Program Year



Program participants who did fill out the program application form themselves generally believe that the participation rules and program requirements are clearly outlined and explained. Overall, they rate the application process as fairly easy, although Custom participants provide a slightly lower mean rating.

Table 14. Program Participant Reactions to the Application Process

	PY2 Prescriptive	PY2 Custom
Agree that application clearly explained program requirements	87% *(n=43)*	93% *(n=27)*
Mean rating of the application process*	7.5 *(n=42)*	6.8 *(n=28)*

*On a scale from 0 to 10 where 0 means "very difficult" and 10 means "very easy."

Several participants who were not satisfied with the application process commented on the difficulty of understanding the application, a need to conduct additional research, and a feeling that the overall application process was lengthy.

Program Responsiveness

The program staff interviewed as part of the evaluation effort believes that the program is very responsive in addressing questions, concerns, or issues raised by program participants. Interviewees praised the call center employees and technical review staff for answering customer questions in a timely manner, and proactively reaching out to program participants with answers and additional information.

Among program participants, use of the call center and technical reviewers in PY2 remained similar to PY1. The only exception is the Custom Program where significantly fewer participants placed calls to the Act On Energy Business Call Center compared to PY1. This

may be the result of repeated participation among some customers, as well as overall greater familiarity with the program. It is also important to note that Prescriptive program participants who did not use a contractor for their project are significantly more likely to place calls to the call center.

Whenever program participants ask questions of the Act On Energy program technical review staff, nearly all get their questions answered in two business days or less. The cases where it took technical reviewers longer to answer the questions are rare and this is consistent with PY1 performance.

Table 15. Participant Utilization of Support Services

	PY1		PY2	
Action taken	**Prescriptive**	**Custom**	**Prescriptive**	**Custom**
Placed a call to the call center	41% *(n=17)*	47% *(n=55)*	36% *(n=80)*	29% *(n=49)*
Asked questions of the technical reviewer	29% *(n=17)*	50% *(n=56)*	28% *(n=77)*	43% *(n=49)*
Response time to questions by Technical Review Staff	**Prescriptive (n=5)**	**Custom (n=26)**	**Prescriptive (n=22)**	**Custom (n=21)**
Within the same business day	20%	73%	59%	67%
1-2 business days	40%	23%	36%	14%
3-5 business days	--	4%	2%	14%
1-2 weeks	40%	--	2%	5%

Customer Satisfaction

Program Administration

The Prescriptive and Custom programs have completed another very strong year from a customer satisfaction standpoint. Nearly all program participants report experiencing no problems with the program (90% and 96% for the Prescriptive and Custom programs, respectively), while satisfaction with various program components continues to be very high. In fact, in some cases, participant satisfaction increased even further from already high PY1 levels. Specifically, Prescriptive program participants in PY2 are more likely to express satisfaction with the measures offered by the program than in PY1. Table 16 below presents additional average satisfaction ratings by program and across the two program years.

Table 16. Participant Mean Satisfaction Ratings for Various Program Elements

How would you rate your satisfaction with…?	PY1		PY2	
	Prescriptive	Custom	Prescriptive	Custom
Act On Energy Business Program overall	8.8 *(n=16)*	8.7 *(n=55)*	9.0 *(n=80)*	8.7 *(n=51)*
The program's technical review staff	8.6 *(n=13)*	8.8 *(n=48)*	8.9 *(n=55)*	8.4 *(n=42)*
The call center's ability to answer your questions	8.3 *(n=7)*	9.0 *(n=26)*	9.2 *(n=28)*	8.3 *(n=14)*
The measures offered	8.3 *(n=15)*	8.4 *(n=40)*	9.1 *(n=78)*	--[11]
Ameren Illinois Utilities	8.1 *(n=17)*	8.4 *(n=55)*	8.5 *(n=78)*	8.5 *(n=51)*
The incentive amount	8.0 *(n=16)*	8.5 *(n=54)*	8.3 *(n=80)*	8.3 *(n=50)*

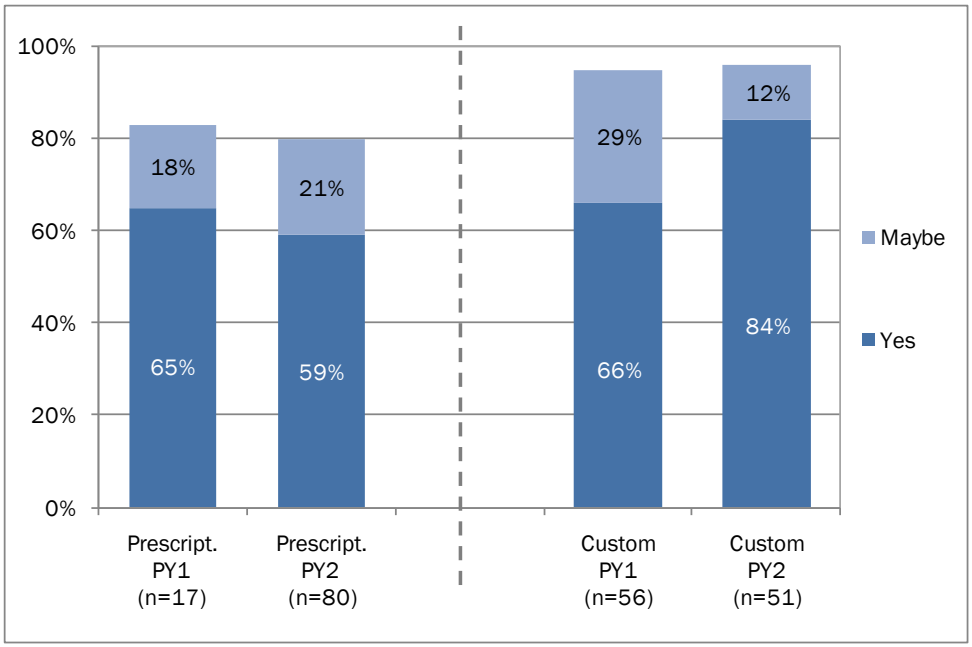
Note: Scale is from 0 to 10 where 0 is "very dissatisfied" and 10 is "very satisfied."

No more than 7% of participants in either Prescriptive or Custom programs indicated they were dissatisfied with a program element, and few mentioned experiencing problems during the participation process (10% and 4% for the Prescriptive and Custom programs, respectively). Among the issues these participants cited were small incentive amounts, especially when compared to the overall project costs, lengthy processing times, and trouble with the technical review staff or the call center employees not understanding their question. These comments, however, are very rare.

The potential for repeated participation remains high. While the inclination of Prescriptive program participants to participate in the program in the future is roughly the same in PY2 as in PY1, PY2 Custom participants are significantly more likely than both Prescriptive participants and Custom participants from PY1 to say they anticipate applying for program incentives in the future.

[11] This question was not asked of Custom program participants in PY2.

Figure 5. Future Program Participation by Program by Program Year



Program Benefits

Program participants, as well as non-participants, value the energy savings, lower maintenance costs, and incentives the program offers. While, overall, program participants and non-participants share a similar view of program benefits, non-participants are less likely to cite monetary rewards for installing energy efficient equipment as a benefit. Given that the initial cost of energy efficient equipment is important to nearly every survey participant, there are potential advantages to further promoting the financial benefits of the program.

Compared to PY1, there has been a shift in what program participants identify as the program's main benefits. Specifically, in PY2, fewer Custom participants name energy savings as the major benefit of the program, while a larger percentage cite the rebates offered through the program along with environmental benefits. Prescriptive participants are also more likely to consider the program's environmental impact one of the main program benefits.

Table 17. Main Benefits to Participating in the Program
(Multiple Response)

Program Benefits	PY1		PY2		Non-Participants (n=24)
	Prescriptive (n=17)	Custom (n=55)	Prescriptive (n=80)	Custom (n=50)	
Energy savings	65%	80%	78%	56%	75%
Rebate/incentive	53%	31%	43%	62%	17%
Lower maintenance costs	24%	22%	23%	32%	63%
Better quality/new equipment	12%	24%	22%	12%	13%
Good for the environment	6%	16%	26%	26%	33%
Other	--	4%	1%	8%	4%

Program Ally and Contractor Performance and Recognition

Satisfaction with contractor performance remains high. Program participants are in near unanimous agreement that their contractor was able to meet their needs. This sentiment is somewhat stronger among the PY2 Prescriptive participants compared to PY1 and is slightly weaker among Custom participants this year compared to last year. Interestingly, Prescriptive program participants who believe that their contractor is affiliated with the Act On Energy program are more likely to rate their satisfaction with the contractor a 9 or 10 on a 10 point scale (100%) compared to those who did not think their contractor was affiliated with the program (82%).

Likely as a result of the high levels of participant satisfaction with their contractors, nearly all participants say they would recommend their contractor to others.

Table 18. Contractor Performance

	PY1		PY2	
	Prescriptive	Custom	Prescriptive	Custom
Mean rating of contractor performance	9.2 *(n=11)*	9.5 *(n=42)*	9.8 *(n=53)*	8.9 *(n=42)*
Would recommend contractor to others	100% *(n=11)*	100% *(n=42)*	100% *(n=53)*	93% *(n=41)*

Note: Contractor performance is rated on a scale from 0 to 10 where 0 is "not at all able to meet needs" and 10 is "completely able to meet needs."

Participant awareness of the term "registered program ally" remains fairly low. Only 29% of the Prescriptive program participants and 34% of the Custom program participants claim they are familiar with the term. Further, participants generally appear to lack knowledge of who program-affiliated contractors are. For example, Table 19 shows participant perceptions of their contractor affiliation compared to data from AIB on whether the participant used a registered program ally for a specific project.

As illustrated in this table, 37% of the Prescriptive program participants and 36% of the Custom program participants used a program ally, but are unaware of this fact. Furthermore,

4% of the Prescriptive program participants and 5% of the Custom program participants did not work with a registered program contractor, but believe they did.

Table 19. Participant Perceptions of Contractor Affiliation with the Program[12]

	Prescriptive (n=55)	Custom (n=42)
Used program ally but think their contractor was not affiliated with the program	37%	36%
Used program ally and know about it	35%	29%
Used program ally but do not know if the contractor was affiliated with the program or not	15%	21%
Did not use a program ally but say their contractor was affiliated with the program	4%	5%

Only half of the Prescriptive program participants (51%) and 42% of the Custom program participants believe it is important that their contractor is affiliated with the Act On Energy Business program[13]. On average, participants in the Prescriptive program rate the importance of their contractor's affiliation a 6, while participants in the Custom Program rate this factor a 5. In general, customer confusion around the term "registered program ally," as well as a lack of knowledge about the benefits of working with one, might explain these fairly low importance scores. It is also possible that program allies are not using their affiliation with the Act On Energy Business program in marketing and outreach to customers. As a result, the program should continue to draw a distinct line between registered and non-registered program allies and promote the benefits of using a registered program ally for Act On Energy Business program projects.

Potential Barriers to Participation

Overall, participants generally believe that there are no drawbacks to participating in the Act On Energy Business program. However, this sentiment was held by fewer Prescriptive program participants (45%) than Custom participants (71%), and also declined between PY2 and PY1 (45% vs. 76%, respectively) for Prescriptive program participants. Burdensome paperwork (Prescriptive – 13%, Custom – 18%), equipment cost (Prescriptive – 8%, Custom – 6%), and insufficient incentive amounts (Prescriptive – 14%, Custom – 2%) are among the most frequently mentioned reasons why current participants think that other companies might not participate.

In addition, as in PY1, a lack of program awareness (53% for the Prescriptive and 56% for the Custom programs) and financial reasons (49% for the Prescriptive and 36% for the Custom) are also seen as reasons why other companies may not participate in the programs. Financial reasons were mentioned by more Prescriptive program participants in

[12]The base is program participants who said they used a contractor for their projects

[13] A rating of 7-10 on a scale from 0 to 10 where 0 means "not at all important" and 10 means "very important."

PY2 than in PY1 (49% vs. 19%, respectively) as the cause of companies' decisions not to participate in the program.

However, non-participants cited reasons including prohibitive costs (62%) and a lack of knowledge about equipment options (15%) when asked about the main barriers to installing energy efficiency equipment.

Non-Participant Energy Efficiency Knowledge and Behavior

The evaluation team asked non-participants a range of questions aimed at establishing the current state of the market and assessing its potential. Research findings show that there is a good deal of knowledge about energy efficiency options and interest in the program among those not participating. Opportunities also exist to provide additional education.

There is a relatively strong knowledge base related to energy efficient options: 67% of non-participants say they are either very knowledgeable or somewhat knowledgeable of the available options that can help save energy costs through increased energy efficiency. However, there is still potential for increased education as only 11% of non-participants say they are very knowledgeable about such options and over a quarter (26%) say they are either not very knowledgeable or not at all knowledgeable.

In terms of equipment purchase behavior, non-participants both installed energy efficient equipment in the past year and also plan on doing so in the coming year. These future installations present a chance for the program to offer energy efficient equipment to those who plan on installing standard efficiency equipment, as well as to those who may also be considering an energy efficient equipment purchase.

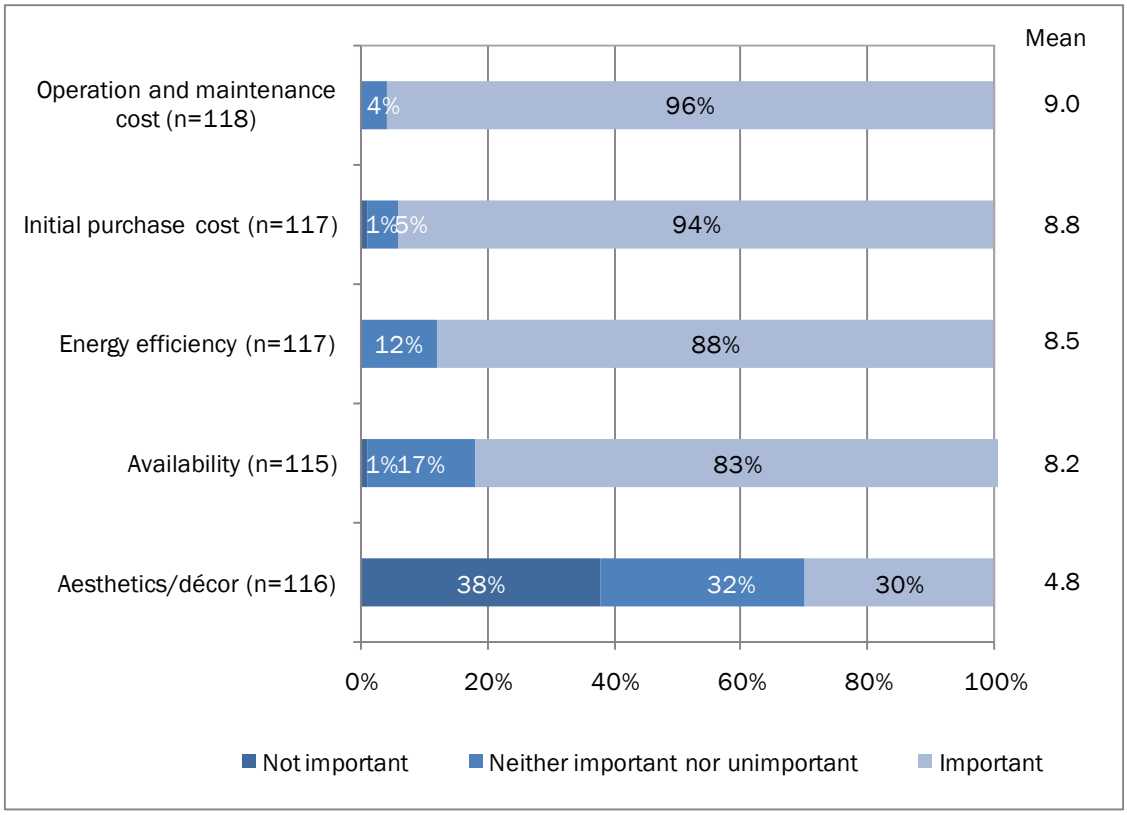
Table 20. Past and Planned Equipment Installations*

Equipment Installation	Percentage of Non-Participants	
	Past Year	Planned
All lighting	17% *(n=98)*	20% *(n=91)*
EE lighting	13% *(n=98)*	15% *(n=91)*
All motors	15% *(n=130)*	9% *(n=130)*
EE motors	6% *(n=130)*	5% *(n=130)*
All cooling	12% *(n=103)*	11% *(n=99)*
EE cooling	11% *(n=103)*	7% *(n=99)*
All refrigeration	3% *(n=130)*	1% *(n=130)*
EE refrigeration	2% *(n=130)*	1% *(n=130)*

*Note: Responses to the questions about past purchases of lighting and cooling equipment are based on decision makers as determined by the questions in the survey, while questions about past purchases of refrigeration equipment and motors are based on all survey respondents.

When making decisions about which equipment to purchase for their facilities, equipment costs and energy efficiency matter more than aesthetic appeal to non-participants. As a result, program messaging highlighting benefits such as energy efficiency, lower initial investment, and a decrease in equipment maintenance is likely to resonate with customers and motivate them to further explore program opportunities.

Figure 6. Importance of Various Factors when Purchasing New Equipment



Those familiar with the program express a high likelihood of participating in the program in the future. Specifically, 78% of non-participants familiar with the Act On Energy Business program say they would be likely to participate in the program in the future, while 22% say they would be very likely. Those who say they would be unlikely to participate list lack of knowledge about the program, burdensome paperwork, and equipment costs as detrimental factors.

Customer-Indicated Areas for Improvement

About a third of the Prescriptive (30%) and Custom program participants (29%) have no recommendations for program improvements. Those who do cite a desire for higher incentives or more incentives, a larger variety of incented equipment, greater publicity of the program, and faster payment processing times. These items are fairly consistent with the areas for improvement mentioned by program participants in PY1.

Table 21. Suggested Program Improvements by Program by Program Year (Multiple Response)

Potential Improvement	PY1		PY2	
	Prescriptive (n=16)	Custom (n=51)	Prescriptive (n=77)	Custom (n=51)
Higher incentives	25%	33%	34%	22%
More incentives	--	4%	21%	25%
Greater publicity	25%	18%	13%	18%
More measures	19%	10%	12%	6%
KAEs provide more information	6%	--	4%	12%
Relax partner guidelines	6%	--	3%	2%
Advance payment	--	2%	10%	4%
Faster processing	--	2%	--	4%
Other	--	10%	12%	6%
No recommendations	38%	31%	31%	29%

3.2.2 Impact Results

While the programs may be having an impact in areas such as trade ally knowledge or the availability of energy efficient equipment, our results focus only on the energy and demand impacts associated with program activities. Gross impacts are defined as the change in energy (or demand) consumption that results directly from program-related actions taken by program participants, regardless of why those actions were taken. Net impacts are defined as the impacts that can be attributed to the program. Net impacts may be lower than total program gross impacts due to energy savings that would have occurred in the absence of the program (free riders). Conversely, net impacts may be higher than total program gross impacts due to energy impacts that occurred because of the program, but were not incented by the program (spillover). In PY2, the evaluation team included free rider adjustments to create the net impacts, but no spillover occurred.

C&I Prescriptive Program

Our impact analysis activities yielded ex post gross kWh and peak kW impact estimates that are slightly lower than the ex ante estimates (Table 22).

Table 22. Gross Impacts – Prescriptive Program

Gross Impacts							
End Use	N Projects	Ex Ante		Ex Post		Realization Rate	
		kW	kWh	kW	kWh	kW	kWh
Grocery	13	11	98,873	11	98,873	1.00	1.00
HVAC	24	245	1,259,795	245	1,259,795	1.00	1.00
Lighting	626	8,749	39,802,646	8,695	39,804,440	0.99	1.00
Motors	26	1,286	7,942,638	869	5,251,488	0.68	0.66
Refrigeration	21	73	1,183,961	73	1,183,961	1.00	1.00
Total	**710**	**10,363**	**50,287,913**	**9,892**	**47,598,558**	**0.95**	**0.95**

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

These lower ex post gross impact estimates are the result of specific adjustments as outlined below.

- Multiple adjustments were made to the lighting ex ante values, some that increased the ex post savings and others that decreased ex post savings. The overall realization rate for lighting is very close to 1, reflecting improvements to the TRM that led to minimal ex post reductions, and hours of use adjustments in PY2 that did not drive up ex post adjustment as much as in PY1. Many PY2 projects had ex post hours that were lower than TRM defaults. Of 45 responses, only four projects had annual full load lighting hours of 8,670 hours. The simple average hours for the 45 responses were 3,793 hours in PY2, which is 12% lower than the TRM default simple average of 4,489 hours.
- Motors and VFD measures incurred substantial reductions in ex post adjustment. The ex ante values in AIB for most measures were significantly greater than the ex post values we estimated using the Ameren Illinois PY2 TRM defaults. Impacts for non-HVAC VFD measures were inconsistent, with some measures reporting a percent savings in excess of our estimate of baseline motor energy usage, while others were more reasonable (percent savings of 31% to 43% of estimated baseline energy usage).
- Refrigeration and HVAC projects had no ex post adjustments as the installed number from AIB and our survey had no differences, and there were no baseline adjustments. The ex ante per unit impact values were not adjusted in the gross impact analysis.[14]

Table 23 below presents the estimated NTGR by measure, and program level net energy and demand impacts attributable to the Prescriptive Program. We found no spillover among Prescriptive Program participants.

[14] While the plan did not call for per-unit assessment of motors measures, the TRM review indicated difficulties in this end use, and the evaluation team chose to review this end use more closely.

Table 23. Net Impacts – Prescriptive Program*

Gross Impacts					
		Ex Ante		Ex Post	
End Use	N Projects	kW	kWh	kW	kWh
Grocery	13	11	98,873	11	98,873
HVAC	24	245	1,259,795	245	1,259,795
Lighting	626	8,749	39,802,646	8,695	39,804,440
Motors	26	1,286	7,942,638	869	5,251,488
Refrigeration	21	73	1,183,961	73	1,183,961
Total	710	10,363	50,287,913	9,892	47,598,558
Gross Realization Rate				0.95	0.95
NTGR					
End Use		Ex Ante		Ex Post	
Grocery			0.76		0.76
HVAC			0.76		0.47
Lighting			0.76		0.78
Motors			0.76		0.63
Refrigeration			0.76		0.90
Net Impacts					
		Ex Ante		Ex Post	
End Use	N Projects	kW	kWh	kW	kWh
Grocery	13	8	75,143	8	75,143
HVAC	24	186	957,444	116	595,448
Lighting	626	6,649	30,250,011	6,793	31,097,194
Motors	26	977	6,036,405	546	3,302,558
Refrigeration	21	55	899,810	65	1,062,096
Total	**710**	**7,877**	**38,218,814**	**7,529**	**36,132,439**
Net Realization Rate				0.96	0.95

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

* Due to rounding, manually calculated net impacts will not match the values presented in this table.

Significant variation in the NTR scores for HVAC and motors projects led to a lower overall NTGR for those end uses. Among HVAC project participants, low program timing scores, indicating that many participants would have installed the equipment at the same time without the program, contributed to some low individual scores and therefore the overall score. Further, in a couple of cases, respondents indicated they found out about the program after they had decided to install the exact same measure.

The evaluation team identified similar issues in the NTG analysis for motors. The average overall influence and program timing scores were below 0.5 and a number of respondents reported they would have done the exact same project at the same time in the absence of the program. As a result, the overall NTG score for this end use is lower than scores for some of the other end uses.

Table 24 below illustrates the change from initial ex ante gross impact values to final ex post net impacts.

Table 24: C&I Prescriptive Savings Overview

	kW	kWh
Ex Ante Gross Impacts	10,363	50,287,913
Ex Post Net Impacts	7,529	36,132,439
Realization Rate	0.73	0.72

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

Small Business Online Store

The evaluation team did not conduct a full impact evaluation of the Prescriptive Program's Small Business Online Store component given its relatively small contribution to the overall portfolio. As a result, ex ante impacts are equal to ex post as illustrated in the following table containing the energy impacts for this program component.

Table 25. Net Energy Impacts - Small Business Online

	Gross Savings		Net Savings
	kWh	NTGR	kWh
Ex Ante	2,978,644	0.8	2,382,915
Ex Post	2,978,644	0.8	2,382,915

C&I Custom Program

Our impact analysis activities yielded ex post gross kWh and peak kW impact estimates that are lower than the ex ante estimates (Table 26).

Table 26. Gross Impacts – Custom Program

Gross Impacts					
	N Projects	Ex Ante		Ex Post	
		kW	kWh	kW	kWh
Custom	195	68,680	33,391,601	47,497	28,652,341
			Realization Rate	0.70	0.86

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

Overall, the custom projects exhibited very high realization rates. However, one key observation for both the Wave 1 and Wave 2 projects is that in both cases, one particular project had a very significant impact on the realization rate for that group of projects. For example, one Wave 1 project had a realization rate of 11%, which equates to a reduction of 712,195 kWh from that project's ex ante estimate. Similarly, three Wave 2 projects had a combined realization rate of 80%, resulting in a total reduction of 677,434 kWh from the combined ex ante estimates. If these projects were removed from the sample, the Wave 1 and Wave 2 realization rates would have been significantly higher.

Table 27 below presents the estimated NTGR and program level net energy and demand impacts attributable to the Custom Program. There was no spillover found among Custom program participants.

Table 27. Net Impacts – Custom Program

Gross Impacts				
	Ex Ante		Ex Post	
	kW	kWh	kW	kWh
Custom	68,680	33,391,601	47,497	28,652,341
Realization Rate			0.70	0.86
NTGR				
	Ex Ante		Ex Post	
Custom	0.77		0.69	
Net Impacts				
	Ex Ante		Ex Post	
	kW	kWh	kW	kWh
Custom	52,884	25,711,533	32,773	19,770,116
Net Realization Rate			0.62	0.77

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

Similar to PY1, there are a number of large participants in the Custom Program. While the program already has mechanisms in place to provide additional oversight and assessment of these projects, it is important that close attention be paid to projects of this size in the future given the impact that they can have on the program's overall performance.

Table 28 below illustrates the change from initial ex ante gross impact values to final ex post net impacts.

Table 28: C&I Custom Savings Overview

	kW	MWh
Ex Ante Gross Impacts	68,680	33,392
Ex Post Net Impacts	32,773	19,770
Realization Rate	0.48	0.59

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

3.2.3 Technical Reference Manual Review Results

Overall, the PY2 version of the TRM is much improved over the version used in PY1. In particular, the document provides much more consistency and clarity in presenting algorithms, assumptions, and results. Recommendations from the PY1 evaluation review were addressed in most cases, with important exceptions noted below. There was only one rebated PY2 measure that was newly added to the PY2 TRM: LED lighting for refrigerated cases.

Lighting Review. There were no changes to the algorithms for the lighting measure. Based on the survey data, however, several changes were made to the analysis. As indicated previously, for the lighting end use (the majority of projects), the hours of operation were calculated using the telephone survey data as well as investigating each instance where the respondent indicated that the number of installations recorded in AIB (and verified over the phone) was not correct. There were other flagged areas in which the engineers delved into the project information within AIB to determine if other adjustments were required. For example, if the respondent indicated that de-lamping occurred or the fixtures taken out appeared to have been efficient already, the information within AIB and provided through the survey was reviewed to determine if the appropriate base case and post case were used within the ex ante estimate of savings. The engineers also reviewed responses to questions asking whether rebated equipment was placed into storage rather than installed, and whether additional fixtures were added to increase lighting levels in a program treated space to determine whether adjustments to ex ante savings were indicated.

There were several site-specific changes:

- Respondents on 3 of 57 lighting projects stated that one of the measures described to them was not installed. In two of these projects, other information sources suggested measures were installed, and possibly the respondent was confused by the name of the measure, which could trigger a "No, did not install" response. The third project had measure savings that could not be confirmed with the information available, and received zero ex post savings for 11,760 ex ante kWh.

- For 2 of 57 lighting projects, respondents answered "don't know" regarding one or more measures installed, but received full credit based on other information that suggested the measures were installed.

- One respondent indicated that six new additional fixtures were installed after completing the 34 fixture one-for-one replacement project to "increase the amount of lighting," resulting in a minor reduction to ex post savings.

- Three of the 57 projects received reductions for reporting baseline equipment that was more efficient than presumed by the default ex ante savings calculation. These projects had installed high performance T8 fixtures (measure BPL60) with a reported baseline of standard T8 fixtures. This is allowed by the program; however, the ex ante default values assume a baseline of T12 and magnetic ballasts. The default savings in the TRM and tracking system should be modified to account for this project type, because the T8

baseline reduces savings by 61%. An ex post adjustment factor of 0.39 was applied to these three projects.

Once adjustments were made and the telephone survey hours of operation were included, an ex post gross impact was calculated from the surveyed group. A gross realization rate was calculated and applied to the entire population of lighting projects. The algorithms applied in the ex post estimate of energy impacts are shown in Appendix C.

Motors Review. We reviewed the calculations of each motor replacement project and adjusted them all. In these cases, the ex ante value came from the TRM value within the tables based on speed, enclosure, and the horsepower of the motor. However, as indicated in the review of the TRM, the default table values appeared to be from the 2005 DEER database and were inconsistent with values we obtained directly by using the algorithms and assumptions stated in the PY2 TRM. For the ex post assessment of impact, we calculated impacts using the TRM algorithm and assumptions, ex ante data, and phone survey responses. Our calculated ex post savings were significantly lower than the ex ante savings in AIB. The algorithms are shown in Appendix C. Additionally, the motor projects received hours of use adjustment based on survey data, resulting in an increase in hours of use and savings for five motor replacement installations.

The review of VFD measures was included within the motors end use and survey questions. Motor replacement and VFD projects were reviewed for baseline and quantity differences based on survey responses, but no adjustments were indicated by the data.

However, an adjustment to VFD ex ante savings for non-HVAC measures was made based on review of the TRM. Ex post savings were limited to the TRM value of 850 kWh per HP and 0 kW per HP for HVAC applications. However, the PY2 TRM did not address non-HVAC VFD applications. For all non-HVAC VFD applications in PY2, Ameren Illinois used the Toshiba Calculator to determine non-HVAC VFD savings. We performed a reasonableness check on the ex ante percent savings for non-HVAC VFDs by estimating baseline motor usage from ex ante data, and comparing claimed savings to estimated baseline energy usage. We estimated baseline usage assuming non-HVAC motors are standard efficiency, 1800 rpm Totally Enclosed, Fan Cooled (TEFC) motors with a load factor of 0.75, drawing our motor efficiency data from the Ameren Illinois PY2 TRM, with operating hours as shown in AIB tracking data.

For seven projects, the percent energy savings for non-HVAC VFDs was over 100% of our estimated baseline usage. For ten other projects, the percent energy savings for non-HVAC VFDs was between 65% and 100% of our baseline usage estimate. To verify savings for non-HVAC VFDs would require a detailed engineering review of project documents supported by on-site Measurement and Verification (M&V). Since the PY2 evaluation did not include that level of Evaluation Measurement and Validation (EM&V) rigor, we concluded that ex post savings for non-HVAC VFDs should be limited to 42% of estimated baseline motor usage for pump applications and 67% for fan and all other motor applications. The realization rate for kW of non-HVAC VFDs was set equal to the kWh realization rate.

Refrigeration Review. The engineering review consisted of reviewing projects and measures from the three project decision-makers reached in the survey. No adjustments were made to any measures based on quantity or baseline responses. Measure-specific questions did not

result in any savings adjustments. No adjustment to ex ante savings was made based on review of the TRM.

HVAC Review. The engineering review consisted of reviewing projects and measures from the project decision makers reached in the survey. No adjustments were made to any measures based on quantity or baseline responses. Measure-specific questions did not result in any savings adjustments. No adjustment to ex ante savings was made based on review of the TRM.

New Measure Review. The team also assessed LED lighting for refrigerated cases, a newly added measure in PY2. We found that the default per unit energy and demand impacts for LED lighting in refrigerated cases are reasonable, and somewhat conservative. The saved energy and demand default values are based on a T8 to LED conversion per door, and did not include interaction factors between the lighting power reduction and refrigeration load, which would increase the savings. The assumptions did not include any weighting for T12 lighting in the baseline, which would also increase the savings. The default demand reduction did not include a coincidence factor (we would suggest 0.94 or higher), but overall, the default demand reduction when used as a coincident demand reduction is still conservative. The Ameren Illinois TRM impacts are 0.0313 kW and 182.3 kWh per door. By comparison, ComEd assumes the coincident demand savings is 0.061KW per door and the annual energy savings is 375 kWh per door.

Overall Findings

Our findings and recommendations from the PY2 TRM review are summarized below:

- The PY2 TRM did not include a write-up for VFDs applied in non-HVAC applications. However, the evaluation team is aware that Ameren Illinois used the Toshiba Calculator to calculate savings from these applications. Through our review, we found that ex ante values in AIB were inconsistent and on some installations, not reasonable. We recommend that Ameren Illinois develop a TRM measure write-up for non-HVAC applications of VFDs and understand that this effort is already underway.
- We recommend that Ameren Illinois review measure baselines for possible improvements due to recent and pending upgrades to state codes and federal standards affecting efficient motors, lighting (fluorescent ballasts), and HVAC (Illinois state energy code).
- We recommend that Ameren Illinois include T8s in the baseline weighting for the high performance T8 measure (measure BPL60), rather that T12 lighting only. This is a recommendation from PY1 that was not addressed in PY2. The default savings in the TRM and tracking system should be modified to account for T8 project types, because the T8 baseline reduces savings by 61%.
- If reliable data can be located, we recommend that Ameren Illinois include T12 electronic ballasts in the baseline weighting for fluorescent measures. In 25 instances where respondents were asked the type of removed ballasts, 6 answered electronic, 6 answered magnetic, and 13 did not know. Respondents of the 6 electronic and 6 magnetic ballasts all claimed T12s as the removed lamp type. We did not make

adjustments to ex post savings due to the unreliability of self reports on ballast type, but the results do suggest follow-up is warranted.

- We found that ex ante facility hours reported for lighting in AIB were not consistent with PY2 TRM per unit energy impacts on some measures. The ex ante per unit impacts in AIB were consistent with the TRM, however. This is appropriate and reflects that fact that Ameren Illinois may collect additional information about hours of use that is documented in AIB while the TRM contains what is expected for per unit impacts.
- We recommend that Ameren Illinois develop motor replacement impacts that match TRM algorithms and assumptions rather than DEER 2005 values. The default table values appeared to be from the 2005 DEER database and were inconsistent with values we obtained directly by using the algorithms and assumptions stated in the PY2 TRM. For the ex post assessment of impact, we calculated impacts using the TRM algorithm and assumptions, ex ante data, and phone survey responses. Our calculated ex post savings were significantly lower than the ex ante savings in AIB. The algorithms are shown in Appendix C.
- We recommend that Ameren Illinois update the HVAC cooling impacts using building energy modeling and Illinois-based climate data and building codes. The current Illinois commercial energy code is based on IECC 2009 (ASHRAE 90.1-2007), while Ameren Illinois claims existing HVAC equipment for unitary HVAC and air-cooled chillers. For ComEd, savings calculations were performed by utilizing DOE-2 models generated with eQUEST software. The models are the same ones used to generate California's DEER with modifications pertinent to Chicago, regarding climate zone and building construction. Using this method, ComEd has estimated impacts for packaged unitary equipment are lower than Ameren Illinois's default values. The TRM review of PY1 expressed concern that some of Ameren Illinois's default HVAC impacts were too high and Ameren Illinois may want to consider moving to an eQUEST model for its TRM assumptions.

3.3 Conclusions and Recommendations

Conclusions

In PY2, both the Prescriptive and Custom programs were very successful from both administrative and marketing standpoints. The Custom Program exceeded its goals while the Prescriptive program fell slightly short of its savings goals. However, both maintained consistently high quality program delivery, resulting in high levels of customer and staff satisfaction. In particular, program participants were very pleased with the application, incentive processing, and customer support processes.

Further, in PY2, the program employed a variety of targeted marketing and promotional activities to enhance awareness of and familiarity with the program. Marketing outreach undertaken as part of the program as well as strategic promotional activities have been successful in increasing program awareness and drawing customers to participate in the program.

While substantially improved over PY1, the PY2 TRM has a number of issues that need to be addressed both immediately and over time to ensure the accurate calculation of energy

savings estimates. The evaluation team identified areas of disagreement over lighting, motor, and non-HVAC VFD assumptions and results.

For the prescriptive component, ex post gross impacts were slightly less than ex ante impacts, and net to gross ratios further reduced ex post savings. This is not surprising as the ex ante values had no NTGRs applied (i.e., an NTGR=1.0). The ex post NTGRs in this evaluation are typical for C&I programs. For example, a review of 13 different C&I evaluations from multiple years within California and elsewhere of ongoing programs with various assessment methods (i.e., self-report and discrete choice) indicated that lighting end uses averaged an NTGR of 0.74, with HVAC at 0.60, refrigeration at 0.74, and "other" end uses at 0.70.[15] A similar review performed close to 20 years ago in California found that commercial prescriptive programs had an NTGR of 0.60.

Impact Recommendations

Based on our assessment of impacts, we recommend a number of adjustments to the TRM related to lighting, motors, and HVAC. In addition, the Custom Program should consider updating or strengthening the review process for very large customers to ensure that all necessary documentation for estimating energy savings and determining sufficient completion of work is provided.

Process Recommendations

Our key recommendations related to the program processes are:

Program Design and Processes

To the extent possible, efforts should be made to address the financial barrier to participation (both cost of equipment and financing) cited by program participants. The program is already in the process of offering additional financial assistance to certain types of non-residential customers. However, if resources are available, the program may wish to consider different financing options that could ease the financial cost of participation for customers that are struggling or have otherwise limited resources.

Marketing

Given the lack of familiarity with the Act On Energy program among non-participating customers, there is an opportunity for more in-depth messaging about the program offerings and energy efficiency technologies available. Program staff could consider additional case studies or other forms of targeted outreach to this group of smaller commercial customers. As part of this effort, the program staff could focus messaging on the energy savings and lower maintenance costs that can result from participation.

[15] Fagan J., Messenger, M., Rufo, M. Lai, P. "A Meta-Analysis of Net to Gross Estimates in California". AESP Proceedings. January 2009.

Program Allies

Customers continue to demonstrate minimal awareness of the term Program Ally, and little familiarity with the benefits that these allies can offer. Furthermore, one third of customers do not know they are working with a program ally. As a result, if the program wants to further expand its Program Ally network, program staff should consider placing greater emphasis on differentiating program allies from non-registered trade allies, as well as promoting the benefits of registered program allies. At the same time, program staff may want to explore the extent to which current program allies use their affiliation with the program in marketing it to potential customers.

4. C&I RETRO-COMMISSIONING PROGRAM

4.1 Evaluation Methods

Given the longer time frame necessary for the completion of retro-commissioning projects, the evaluation team monitored program participation and expected savings to determine the appropriate evaluation approach. Initially the program exceeded the benchmark of 15% of the portfolio's total ex ante savings and the team began work on the impact evaluation for the program. Ultimately, the 15% benchmark was not met, making a full impact assessment unnecessary. However, given our success in completing data collection and analysis, we provide a gross impact analysis for this program.

4.1.1 Process Analysis

For the process analysis, we used data from two data sources: in-depth interviews and a review of secondary data. The evaluation team conducted in-depth interviews with the one program manager, one implementation contractor, and two RSPs that completed projects during PY2 and are officially affiliated with the program. Secondary data included program materials received from Ameren Illinois.

4.1.2 Review of Verification and Due Diligence Procedures (Task 2)

In PY1, we explored the quality assurance and verification activities currently carried out by Prescriptive and Custom Program and implementation staff and compared the program with best practices for energy efficiency programs using best practices guidelines.[16] In PY2, we conducted this exercise for the Retro-Commissioning Program comparing the quality assurance and verification activities in place to industry best practices for similar business programs. The purpose was to determine:

1. If any key quality assurance and verification activities that should take place are currently not implemented.
2. If any of the current quality assurance and verification activities are biased (i.e., incorrect sampling that may inadvertently skew results, purposeful sampling that is not defendable, etc.).
3. If any of the current quality assurance and verification activities are overly time-consuming and might be simplified or dropped.

This assessment primarily relied on in-depth interviews with program and implementation staff and documentation of current program processes as outlined in the Technical Reference Manual. Results are summarized in Section 4.2.1. The full review memo is provided in Appendix B.

[16] See the Best Practices Self Benchmarking Tool developed for the Energy Efficiency Best Practices Project: http://www.eebestpractices.com/benchmarking.asp.

4.1.3 Impact Analysis

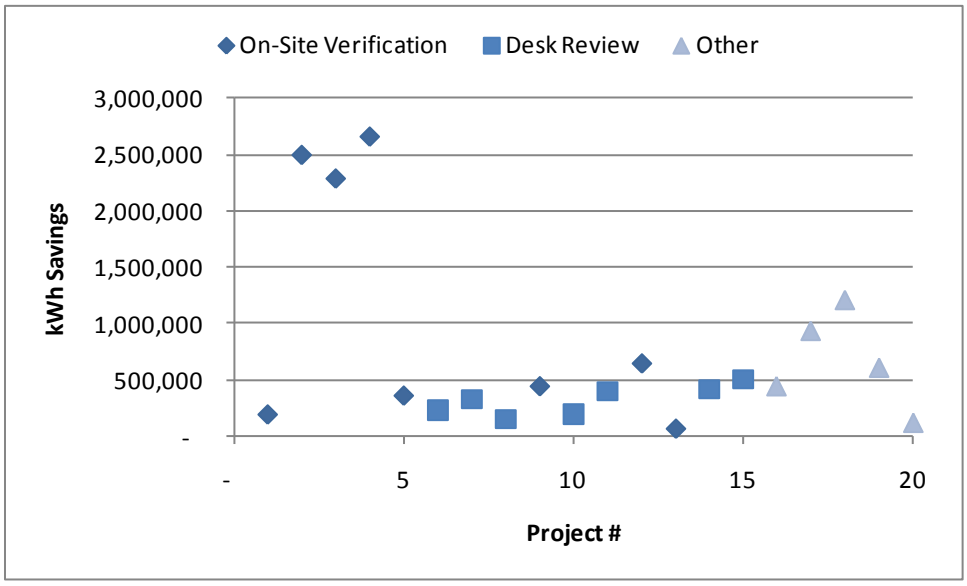
Gross Impacts

Retro-Commissioning Engineering Review and On-Site Verification

The impact evaluation included 15 completed PY2 projects. In addition to the 15 projects, we added four after the analysis was concluded and included another project that was partially completed in PY2.[17] As a result, we applied the gross realization rates presented later in this report to each of the additional projects to achieve our program level impact estimates. The evaluation team employed two impact estimation techniques: (1) on-site verification visits for eight sites and (2) a desk review of project documentation for the remaining seven sites.

The projects spanned a wide range of savings potential. Figure 7 presents the size of projects and the evaluation techniques applied. The eight sites with on-site verification account for 61% of ex ante[18] savings.

Figure 7. Ex Ante Project Savings and Impact Evaluation Method



As part of both the impact and process evaluations, we reviewed data from the seven sites where site visits were not performed, making high-level observations about the program processes and reviewing the types of project data collected. The latter activity is designed to determine whether sufficient information is currently collected to support future impact evaluation.

[17] The omission of these projects from the original sample frame is due to a miscommunication regarding the status of these projects at the beginning of the evaluation process. We have set in place additional procedures for next year's evaluation effort to prevent this issue from arising again.

[18] ex ante savings are estimates of savings in the utility tracking system or what the utility believed they had saved prior to the evaluation.

The on-site verification included a review of project documentation; a visit to each site in the sample and visual verification of equipment installation, staging, and setpoints; interviews with staff; and inspection of leak repair reports. The evaluation team then entered the data collected into AirMaster+ software.[19] Gross savings are the modeled difference between reported pre-program conditions and the post-installation conditions found during the evaluation. Demand savings used model results during the peak hours of 4:00 pm to 7:00 pm.

Sampled participants that did not receive an on-site inspection were evaluated with a desk review of documentation. The evaluation team supplemented desk reviews with follow-up calls to participants and applied compressor performance curves when compressed air demand or pressure was changed. The evaluation team examined which retro-commissioning measures were implemented and documented in project verification forms, and then recalculated savings to arrive at ex post[20] savings estimates.

Almost all retro-commissioning studies included three types of recommendations:

1. Leak repair, which included a compressed air leak log detailing small, medium, large, and extra-large leaks with estimated savings.
2. Other retro-commissioning tasks such as compressor sequencing or system pressure reduction that might have estimated savings.
3. One or more capital projects that fall outside the realm of the Retro-Commissioning Program. These capital projects sometimes had savings estimates, but usually they simply cited the potential for further savings and noted that Ameren Illinois's Custom Program would be an appropriate route to apply for further utility incentives.

The evaluation team only counted savings for measures if the Verification Form indicated completion, e.g., if invoices for additional work were included in the project file or if completion was confirmed through interviews with site personnel.

Net Impacts

The PY2 evaluation of the Retro-Commissioning Program did not include the development of a net-to-gross factor based on free-ridership, participant spillover, and non-participant spillover given that the program accounted for less than 15% of the total portfolio ex ante savings. However, we did explore free-ridership through interviews with participating customers. Free-riders are program participants who would have implemented the incented energy efficient measure(s) even without the program. Our assessment is based on a series of questions that explore the influence of the program in making the retro-commissioning upgrades as well as the likelihood those actions would have been taken without the incentive. In total, we conducted interviews with six participating customers.

[19] US Department of Energy, Industrial Technologies Program, Best Practices, Version 1.2.3, October 8, 2008: http://www1.eere.energy.gov/industry/bestpractices/software_airmaster.html. AIRMaster+ is a software tool that helps users analyze energy use and savings opportunities in industrial compressed air systems. AIRMaster+ is also used to baseline existing and to model future system operations improvements.

[20] Ex post savings are estimated savings after the impact evaluation.

Customers participating in the NTG interviews were smaller in size compared to the full population of program participants. This is likely due to the fact that smaller sites were not asked to participate in the on-site verification process and, therefore, were more willing to spend time speaking with the evaluation team. Given the size of the interview respondents, we chose to apply the default NTGR of 0.8 for the Retro-Commissioning Program in PY2. As part of our impact evaluation in PY3, we plan to develop a different structure for the collection of NTG-related data to balance respondent burden with the need for this information from larger participants.

4.1.4 Sampling and Survey Completes

On-Site Verification

The evaluation team selected a sample of eight projects for site verification using a stratified random sample design. This stratification was done using the Delanius-Hodges method to determine strata boundaries and the Neyman allocation to determine the optimal allocation of the available interviews to the strata. The largest four projects were in one stratum and sampled with certainty (i.e., all were reviewed). The second stratum contained the remainder of the population with four projects chosen at random.

Table 29. Retro-Commissioning Site Visit Sampling Approach

Sampling Strata	KWh Savings Range	Number of Projects	Completed Visits
1	70,000 – 500,000	12	4
2	500,001 – 2,700,000	4	4
TOTAL		15	8

Note: As noted above, four additional projects were ultimately completed in PY2, but were not included in the initial population of projects from which we drew the sample.

The purpose of stratifying the sample was to ensure that the projects we assessed represented a sufficiently large proportion of program savings, so that savings-related results are representative of the population with a confidence of 90% and a precision level of 10% or better. Ultimately, this sample design provides statistically valid impact results at a 90% confidence level +/- 7% for the program overall.

RSP Interviews

Opinion Dynamics conducted in-depth interviews with two of the five RSPs that completed projects through the Retro-Commissioning Program in PY2. Interviews were completed in August 2010.

4.2 Results and Findings

4.2.1 Task-Specific Results

Establish Verification and Due Diligence Procedures for Implementer

Overall, Ameren Illinois's quality control and verification procedures for the C&I Retro-Commissioning Program are sufficient to ensure quality projects. However, in general, compared to other C&I programs in the Act On Energy Business portfolio, the number of quality assurance activities in place is low. We suggest that Ameren Illinois first formally document the existing sampling methodology used for post inspections of RSP work, and second, consider expanding the number of these inspections to ensure that projects are completed as expected.

Table 30 summarizes the quality assurance and verification activities currently carried out by the C&I Retro-Commissioning Program. It also presents recommended changes to current procedures.

Table 30. Summary of Quality Assurance Activities in Place and Recommendations

QA Activities in Place	Recommended Change
• Eligibility checks	• None
• Engineering review	• None
• Verification survey (RSP)	• None
• On-site survey/Post inspection (SAIC Staff)	• Document current on-site survey inspection guidelines • Consider expanding the scope of current post-inspection activities to cover more than 10% of completed projects
• Screening of Participating RSPs	• None

Full results of the due diligence and verification procedures are provided in Appendix B.

4.2.2 Process Results

Program Changes

The primary change to the Retro-Commissioning Program in PY2 was the establishment of the RSP network. In creating the network, Ameren Illinois identified program allies that had previously worked with the C&I Prescriptive and Custom programs and had an interest and expertise in retro-commissioning. The staff then issued a Request for Qualifications (RFQ) and invited these companies to submit a proposal to participate in the program. The RSPs went through this RFQ process to ensure that they had the skills and experience necessary to be an official service provider.

Another change from the initial program design relates to the participation of non-affiliated RSPs. In select cases, program staff allowed non-affiliated contractors to provide retro-commissioning services through the program. This situation arose after a customer stated they wished to participate in the program, but wanted to use a service provider with which they had an existing relationship, but who was not on the list of approved RSPs. In these situations, the program allowed the contractor to assist with the project after two conditions were met: (1) the customer signs an affidavit stating that they do not want to work with an RSP on the approved list, and (2) the contractor completes documentation similar to the RFQ to verify their qualifications. The program staff granted this exception on a case-by-case basis, and the program manager reports that only a few customers have participated with a non-affiliated RSP.

Now that the program is fully operational, data tracking also occurs through AIB in a manner consistent with the C&I Prescriptive and Custom programs. Program staff are pleased with the data-tracking process and feel they have the information they need to make informed decisions about the program and participant projects.

Program Participation

Participating Customers

In PY2, the program completed 19 retro-commissioning projects and one additional project that was 70% complete before being transitioned to PY3.[21] The majority of these projects are compressed air projects while two are healthcare related. Most participating customers completed only one project. Only two customers had two retro-commissioning projects in PY2 (each project was at a different address and associated with a different account number).

Retro-Commissioning Service Providers

Through the RFQ process, Ameren Illinois recruited 14 RSPs to work with the program. Among those selected, eight specialized in healthcare while six work on compressed air projects. Since the beginning of PY2, three RSPs have completed projects through the program. One of these was involved in 13 of the 16 projects (81%).

The skewed participation among RSPs is not a surprise to the program manager, although the program would like to see a greater number of RSPs completing projects. In general, as participation in the program increases and as the initial healthcare projects are finalized, the program expects to see broader RSP participation. At present, Ameren Illinois is examining the breakout of PY2 projects by service provider and market to identify ways to increase broader participation. However, the program staff also makes a point of stressing to customers that they are vendor-neutral and do not have a preference for certain RSPs.

The program manager believes that the low number of healthcare projects is due to the risk-averse nature of the RSPs in that industry, resulting in less marketing and outreach by this group of RSPs compared to those involved in compressed air projects. Additionally, the

[21] According to the AIB extract received by the Evaluation Team in June 2010.

energy savings achieved relative to survey costs are lower for healthcare projects than compressed air projects. The result is that healthcare projects may not qualify for the program or may only receive the minimum incentive level.

Program Outreach

Some aspects of program outreach appear to increase program awareness. In particular, the main method of outreach, RSP marketing and co-branding, is effective in encouraging Ameren Illinois customers to participate in the program. According to in-depth interviews with participating RSPs, this is likely an effective mechanism given that most participants are already customers of the RSPs and are largely convinced by them to participate. However, RSPs report that overall awareness of retro-commissioning among their customers is relatively low and that awareness of the Ameren Illinois program is even lower.

RSPs believe that direct contact with customers is the most effective way to promote retro-commissioning due to the complexities of the process. They report encouraging Ameren Illinois to visit customers to promote this program, as well as their other C&I programs. Although RSPs recognize that resource constraints may limit the utility's ability to do this, they find that customers who have direct contact with the program staff, with or without the RSP present, are more likely to understand the program and participate than customers that only receive mailings.

Beyond RSP marketing efforts, outreach for the program consists of media events, such as regional trade association conferences showcasing completed projects, as well as one-on-one meetings with customers. The program further markets itself through key account executives and the Act On Energy website. In addition, in-depth interviews with participating RSPs indicate that Ameren Illinois recently held a "symposium" for potential customers to learn about retro-commissioning.

Program Processes

The retro-commissioning process can be divided into four phases: application, system survey, implementation, and verification. RSPs are generally involved in all these phases to some degree and feel that overall the process runs smoothly. In addition, the RSPs view the application and payment processes as smoothly providing incentives to customers.

In terms of the application phase, RSPs report that they typically fill out the application in its entirety. They also note that it is easy to complete the application and they find the overall process reasonable. While generally satisfied with the process, however, RSPs do have some reservations about application processing. The RSPs we spoke with reported that the wait time between submission of the application and pre-approval can range from one to four weeks. They note that if the processing time drags on, the customer is more likely to lose interest in the program and the project. As the program has matured, the long wait time for pre-approval has remained an issue, although the program recently brought in new staff to help with this.

RSPs are also generally satisfied with the final application and payment process. In one isolated case, an RSP did report problems with the payment process. Specifically, the release of payment to the RSP did not take place, requiring additional coordination between the company and the participant. However, these types of issues are rare.

An additional issue identified as part of the evaluation effort is the fact that participating customers and RSPs were not fully aware that outside verification of projects could take place. Although the application briefly mentions the possibility of utility verification (page 3 of the application and item 10 of page 6), program staff should call out these passages to customers and RSPs when accepting applications. This lack of awareness caused initial difficulties for the evaluation team, although intervention by the Ameren Illinois program manager ultimately helped to resolve this.

RSP Experience and Satisfaction with the Program

RSPs report that they are very satisfied with the Retro-Commissioning Program. They state that the program has brought in new business by incenting customers to implement projects that they might not have done otherwise. The program also helps the RSPs to expand their skill set by promoting and implementing retro-commissioning projects, which may not have always been the focus of each participating contractor. In addition, the RSPs we interviewed were very satisfied with the support and responsiveness of SAIC and Act On Energy staff.

One area of slight dissatisfaction relates to the variable incentive level offered by the program for the retro-commissioning study. In particular, the RSPs we spoke with would prefer a set incentive level as opposed to the uncertainty associated with the 50%-80% window. Under the current program model, the RSPs risk overpromising incentives to their customers, making it hard for customers to make informed decisions.

In addition, although the evaluation team did not ask participating customers about their experience with the program, we did ask RSPs about their perception of customer satisfaction. Based on their experience, RSPs believe that satisfaction with the program among participating customers is high.

Opportunities for Program Improvement

The RSPs with whom we spoke identified the following areas for potential improvement:

- Based on feedback from select RSPs, Ameren Illinois may want to assess the feasibility of increasing the Act On Energy staff's direct contact with customers through more outreach at targeted events and conferences. Direct contact appears to be the best way to explain retro-commissioning and the program requirements and incentives, and to foster participation in other C&I programs.
- Program staff may want to consider adopting a set incentive level instead of the range of 50% to 80%. This will allow Ameren Illinois and the RSPs to better promote the program, as well as provide customers with more information when deciding whether to participate. Additionally, a set incentive level may reduce some of the review time required before approval of the project.

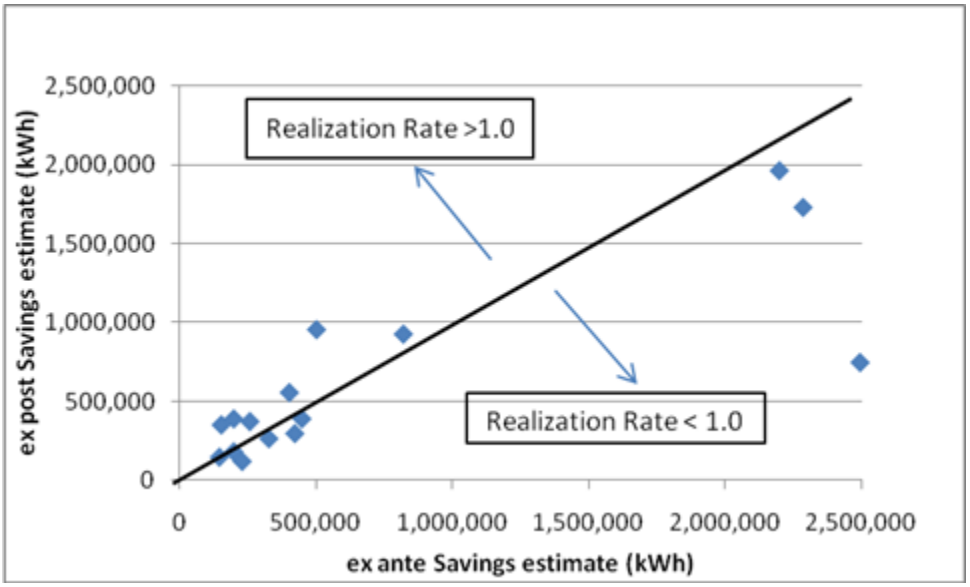
4.2.3 Impact Results

Gross Impact Results

Most participants focused on the leak reduction measures since, in most cases, repairing leaks would achieve the participant's minimum savings requirements—usually 70% - 80% of

application estimated savings. Other measures implemented were mostly simple control changes that optimized the sequencing of the machines without requiring further capital investment. Where only leak repair was implemented, the results varied depending on how thoroughly the participant fixed the leaks. Since savings estimates were based on fixing a fraction (usually about 60%) of identified leaks, many participants who aggressively fixed leaks achieved greater than 100% of ex ante estimates. Figure 8 shows the distribution of ex post savings as compared to ex ante gross savings estimates.

Figure 8. Ex Post and Ex Ante Gross Savings



Overall, the program's gross impacts are strong, as illustrated in Table 31, which presents the kW and kWh gross savings and realization rates. In general, most projects' verified (ex post) savings were close to ex ante estimates; only a single project had a realization rate below 0.83. Slightly lower ex post gross savings estimates are the result of modeling results using AirMaster+ software and on-site observation of which project recommendations were fully implemented. In addition, realization rates for energy savings are less than 1.0 for some projects due to an oversimplified calculation for demand savings on the application form. This oversimplification involves assuming that electric demand is proportional to flow.[22] For most rotary screw machines, this relationship is not accurate as the power reduction is less than proportional to flow reduction.[23] Overestimating demand savings in this manner will lead to the over estimation of energy savings.

Demand savings have a realization rate greater than 1.0 largely because the program assumed no demand savings for six projects when the evaluation team determined there was indeed demand savings associated with these projects.

[22] Act On Energy Application Page 10 of 21

- Determine energy lost due to leaks (kW) (estimated total cfm lost/plant cfm per kW)
- Determine annual energy usage lost due to leaks (kWh) (kW x operating hours/year)

[23] Fundamentals of Compressed Air Systems, The Compressed Air Challenge, section H5, 2004

Table 31. Gross Impacts – Retro-Commissioning Program

	Gross Savings	
	kW	kWh
Ex Ante	1,236	12,639,662
Ex Post	1,222	10,889,702
Gross Realization Rate	0.99	0.86

Note: Realization Rate (RR) = Ex Post Value/Ex Ante Value.

During the evaluation team's assessment of gross impacts, it became clear that the ability of participating customers to submit final paperwork up to 60 days after the end of PY2 (May 31, 2010) caused some unforeseen timing issues in terms of the ex ante savings review. In PY3, the evaluation team suggests that impact evaluation for this program begin at a later to date to allow for the entry of finalized ex ante estimates into the AIB database. Discussions with program staff regarding the engineering review process indicate that ex ante estimates for a given project are revised over time as additional information becomes available. As a result, we also suggest that additional detail be included in data tracking for this program so that both program staff and evaluation team members can monitor the change in ex ante estimates over time and determine where in the review process a specific project is at that moment in time.

The database could track the development of ex ante estimates by creating additional fields for the estimate at a given period of time such as the estimate from the RSP report, from the initial application, from the final application, and/or any intermediary steps that program staff takes in establishing the final savings estimate. This additional data will help the evaluation team better understand where each project is in the review process and whether or not savings values in AIB are final or subject to change.

Net Impact Results

Interviews with program participants indicate that none had ever conducted retro-commissioning at any of their facilities and that five out of six had never even previously considered such a project. The participants with whom we spoke were, however, aware of some retro-commissioning, but not all of the equipment performance issues identified as a result of the retro-commissioning study were performed for them by an RSP. A smaller number (4/6) also knew about some of the upgrades or measures suggested by the RSP as a result of the study.

In terms of the program's influence on customers' decisions to participate, all but one participant rated the importance of available funding for the study as a 10 on a scale from 0 to 10 where 0 means "not at all important" and 10 means "extremely important." The recommendation of the customer's RSP is also important. For example, four of six respondents rated the importance of the RSP recommendation an 8 or above on the same scale.

More than half of the respondents (4/6) said that they would have implemented some of the retro-commissioning recommendations even if the program had not been available. However, all said they would have taken those actions later, suggesting the program did

have some impact on project timing. Overall, these findings indicate that free-ridership is not a significant concern for this program.

As mentioned in the methodology section of the report, the evaluation team had difficulty completing interviews with the largest participants. Engaging these participants in the NTG interviews was a challenge given their prior cooperation in the on-site visit process. In addition, the team learned during recruitment for the site visits that many participants were unaware of their obligation to participate in evaluation activities. As a result, requests to participate in both interviews and on-site visits likely posed an unanticipated burden for these larger participants.

Based on the limited response from this larger participant group, the findings from the NTG interviews are not representative and we chose to use the default NTGR established for the program. We provide the net savings estimates from the Retro-Commissioning Program below.

Table 32. Net Impacts - Retro-Commissioning Program

	Gross		NTGR	Net	
	kW	kWh		kW	kWh
Ex Ante	1,236	12,639,662	0.8	989	10,111,730
Ex Post	1,222	10,889,702	0.8	977	8,711,762

Table 33 illustrates the change from initial ex ante gross impact values to final ex post net impacts.

Table 33: C&I Retro-Commissioning Savings Overview

	kW	MWh
Ex Ante Gross Impacts	1,236	12,640
Ex Post Net Impacts	977	8,712
Realization Rate	0.79	0.69

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

4.3 Conclusions and Recommendations

Conclusions

The transition of the Retro-Commissioning Program from pilot effort to full-scale program has gone smoothly and participation in the program has increased substantially. Nineteen customers completed projects at 19 facilities while one customer partially completed a project. Overall, these projects resulted in ex ante gross energy savings of 12,639 MWh compared to the program's goal of 1,230 MWh. While ex post net impacts were lower than ex ante impacts, the overall ex post impacts for the program are strong. In addition, free-ridership does not appear to be a serious concern for the program at this time.

Program staff are satisfied with the program's operation and there has been good implementation fidelity (i.e., the program is being implemented as planned). RSPs also

report high satisfaction with the program, program staff, and the overall participation process.

In addition, Ameren Illinois's quality control and verification procedures for this program are sufficient to ensure quality projects. Eligibility checks, engineering review, and the RSP verification process work well. However, Ameren Illinois should consider making changes to the process whereby SAIC staff inspect RSP work.

Impact Recommendations

We make the following recommendations based on our impact assessment:

- Collect additional equipment and system-level data. As noted in the PY1 evaluation, to effectively assess the impact of the Retro-Commissioning Program, additional information related to the existing air compressor equipment and systems at participating facilities is needed. For example, the evaluation team needs detailed control sequences, equipment schedules, and part-load performance curves, preferably those specific to the equipment under consideration (both installed and baseline), but at a minimum generic ones. In addition, information is needed related to pre- and post-project compressor operations (i.e., What compressors are operating? How are they sequenced? What is the metered kW for each compressor?). This would allow the evaluation team to model compressors accurately for a given site.

- Consistently update the program database with new project savings information and document the changes in savings estimates over time. When examining project information in AIB before the 60-day window for project completion closes, it is difficult for the evaluation team to determine how close to final the ex ante savings values are. For example, when the team reviewed the database for sampling purposes in June, we found that in many cases, the ex ante savings in AIB were the same as the application pre-approval *minimum* savings. While it is understandable that the database was not yet updated with the findings from the retro-commissioning study or the Verification Form, it would have been helpful for the team to know where program staff were in the process of finalizing the estimates. Also related to tracking savings information, we suggest that ex ante savings for retro-commissioning measures be tracked separately from retrofit/replacement measures that are often included in the retro-commissioning studies.

- Clearly document the measures implemented through the program as part of the post-inspection process. The post-inspection form does not currently include a description of what the RSP staff did or did not see; rather it is a check-off that the inspection was done.

- Clearly document and track in the database which measures are claimed in the Retro-Commissioning Program as opposed to the Prescriptive and Custom programs. If a piece of the retro-commissioning project is broken out for application through the Custom Program, the retro-commissioning project file should contain an explanation of which measures are implemented through which program.

- Determine whether an earlier deadline is needed for the completion of project work or establish a later timeline for the evaluation of retro-commissioning projects. There were

several sites where the evaluators completed verification prior to SAIC completing their post-inspection or providing payment of the project incentive. Although permitted based on program guidelines, to the extent possible, these activities should be completed prior to evaluation site visits so it is clear that projects are officially complete. Further, several participants reported they were still implementing retro-commissioning measures, such as repairing leaks, when evaluation team engineers visited their facilities.

- Continue to require a completed Verification Form and all supporting invoices for materials and services used to implement measures, including accounting for in-house labor such as work orders, prior to determining a retro-commissioning project is finished and paying incentives. This is a current practice within the program, but having some designation or flag to indicate that documentation is considered final would be helpful for future evaluation work.

Process Recommendations

We make the following key recommendations related to program processes:

- Given the importance of quality assurance and control, program staff should document the protocol for SAIC inspection of RSP work. In addition, program staff should consider expanding the number of SAIC inspections performed each program year. While the documentation of any inspection strategy should be used for internal audiences only, knowledge that there is a formal procedure can encourage RSPs to do the best work possible.

- Program staff should continue to consider ways to encourage greater RSP participation in the program. One option is to establish an annual review process for RSPs and include the number of projects completed each program year as one of the performance metrics. Depending on the level of RSP activity in PY3, program staff may also consider requiring RSPs that do not complete projects to re-apply for affiliation with the program the following year.

- Educate participants about program responsibilities. Ensure that participating customers, as well as RSPs, are aware that outside verification of projects is a possibility. Open communication about this aspect of program participation will set reasonable expectations for all those involved in implementation of the projects and ensure the evaluation process runs smoothly.

- Where possible, the program should try to reduce processing time for key project paperwork. The evaluation team fully recognizes that resource constraints may make adding or maintaining additional staff to help with this process infeasible, but enhancing the customer experience will help to foster high program satisfaction. Program staff should monitor processing times and RSP/customer feedback in PY3 to see if the PY2 experience improves efficiency.

5. SMALL BUSINESS HVAC

Given that the savings from the Small Business HVAC Program accounts for less than 15% of the overall portfolio savings, the evaluation team conducted only a process assessment of this program.

5.1 Evaluation Methods

5.1.1 Process Analysis

The process analysis used in-depth interviews with both program staff members and participating trade allies. In-depth interviews provided the evaluation team with a comprehensive understanding of the program. We performed in-depth interviews with one program manager, one implementation contractor, and three Small Business HVAC contractors.

Trade Ally In-Depth Interviews

Opinion Dynamics completed in-depth interviews with trade allies participating in the Small Business HVAC Program. A set group of trade allies provide services through this program, and we conducted interviews with 3 of the 17 firms that completed PY2 projects. Interviews were completed in July 2010.

5.2 Results and Findings

5.2.1 Program Participation

Customers

In PY2, 164 HVAC tune-up projects[24] were completed through the Small Business HVAC program. Of these, 116 received electric incentives. Within this group, a total of 24 unique commercial customers completed projects, as some companies implemented more than one project. In particular, one company completed 89 projects at various locations.

Trade Allies

As of August 2010, the Act On Energy Business program had 393 registered program allies. Of these, the Small Business HVAC program manager estimates that about 75 are active specifically in the HVAC market. In PY2, the 116 electric projects were completed by six trade allies, three of which are registered program allies. Most trade allies only completed one project in PY2, while one company completed 109 projects.

[24] As of 6/29/2010, of the 116 completed projects with electric savings, 112 received the incentive check and 4 were pre-approved.

5.2.2 Program Awareness

Program Outreach

Ameren Illinois promotes the Small Business HVAC program in a variety of ways, including direct mail to eligible customers, direct mail co-branded with program allies, Chamber of Commerce e-newsletters, and bill inserts. In addition to Ameren Illinois marketing materials, program allies promote the program in their own advertisements and report that customers are generally very aware of the program's existence due to marketing from both Ameren Illinois and the contractor.

Outreach to Program Allies and Contractors

Participating program allies generally learned about the Small Business HVAC program through direct contact with program staff. In speaking with them about their experience, the evaluation team also found that these contractors often participate in other HVAC programs, including the Residential HVAC Program and the E-Smart Thermostat Program.

5.2.3 Program Processes

Participation Process and Requirements

Application Process

Participating trade allies report that the application process is easy to complete. Among the trade allies interviewed, all report that they filled out the application. They also describe a process by which the trade ally will often request information from the customer, such as their account number, but complete the technical portion of the application themselves. Based on this experience, the trade allies find the application generally easy to complete. They also note that it is rare for Ameren Illinois to reject applications and, if that occurs, the ally simply corrects the error and resubmits the application. Trade allies also report that the wait time for the incentive is usually about one month, but did voice any complaints about this processing time.

Contact with the Program

Trade allies involved in Small Business HVAC projects report having regular contact with the program staff for this program, as well as other HVAC-focused programs offered by Ameren Illinois. In particular, questions are most often raised by a trade ally during submission of the pre-approval application.

Contractor Suggested Areas for Improvement

Trade allies gave several suggestions to improve the Small Business HVAC program. In particular, in-depth interviews with program allies reveal that simplifying the incentive structure so that a set amount is offered for each type of equipment instead of basing the incentive on kBtuh would enable them to advertise more effectively to their customers. Given the complexity of the current incentive structure, program allies believe they can only

advertise that an incentive is offered by the program, but not a specific dollar amount. In their opinion, offering a specific monetary amount may generate more sales.

5.2.4 Impacts

The evaluation team did not conduct a full impact evaluation of the Small Business HVAC Program given its relatively small contribution to the overall portfolio. As a result, ex ante impacts are equal to ex post as illustrated in the following table containing the energy and demand impacts for the program.

Table 34. Small Business HVAC Savings

	Gross Savings		NTGR	Net Savings	
	kW	kWh		kW	kWh
Ex Ante	1,374	3,092,316	1.0	1,374	3,092,316
Ex Post	1,374	3,092,316	1.0	1,374	3,092,316

5.3 Conclusions and Recommendations

Conclusions

The program is generally running well from a process perspective. Program staff have implemented it according to plan and interact well with participating trade allies. Overall, these participating trade allies are satisfied with the program and feel that program staff are accessible to them should questions or issues arise.

Process Recommendations

We make the following key recommendations related to program processes:

- While trade allies report that the program's current marketing materials appear effective, program staff should work with trade allies in PY3 to identify additional marketing tools that would help them reach small customers targeted by the program. Given the limited time and resources available to small businesses to research energy efficiency opportunities, any additional support the program can provide to direct outreach by trade allies is likely to benefit the program.
- To the extent possible, program staff may want to consider simplifying the program's incentive structure so that a set amount is offered for each type of equipment. Smaller customers with fewer resources may find the program more attractive if there is a higher level of certainty around the incentive amount. Trade allies also believe that this would enhance their advertising and enable them to reach more customers.

6. OTHER PROGRAM EFFORTS

6.1 Demand Control Program

In PY2, Ameren Illinois implemented the Commercial Demand Control Thermostat Program in place of the previously planned Demand Credit Program. Through this program, eligible small business customers received a Comverge SuperStat Programmable Thermostat that cycles the customer AC unit upon receipt of an Ameren Illinois signal during peak demand periods. The program, which focused on Peoria, Champaign-Urbana, and Metro East in PY2, is available only to customers in rate classes BGS-2, BGS-3A, RTP-2, or RTP-3A.

While Ameren Illinois did not call any demand control events during PY2, the program installed 638 thermostats at participating customer facilities. The program offered thermostats alone and also as part of a special offering with furnace tune-ups. For the purpose of our analysis, the evaluation team assumes that the program replaced non-programmable thermostats with programmable thermostats as we would not expect energy savings to result in the event of a switch of one programmable unit for another.

The evaluation team did not conduct a full impact evaluation of the Demand Control Thermostat Program given its relatively small contribution to the overall C&I portfolio. As a result, ex ante impacts are equal to ex post as illustrated in the following table containing the energy impacts for the program.

Table 35. Net Energy Impacts – Demand Control Thermostat Program

	Gross Savings		Net Savings
	kWh	NTG	kWh
Ex Ante	299,655	0.77	230,734
Ex Post	299,655	0.77	230,734

Given the mix of demand response and energy efficiency components within the program, we present a separate discussion of demand impacts. Determining potential demand impacts for the program in PY2 involves assessing the amount of callable demand (i.e., the amount of demand that could be moved from a peak period to a non-peak period). To do this, the team reviewed the spreadsheet developed by the Cadmus Group, which documents that Ameren Illinois could save 1.4 kW per thermostat per event. As a result, if Ameren Illinois called an event, the demand savings would equal 893 kW. However, while critical for planning purposes, this controllable load cannot be claimed in PY2 given that an event did not take place.

A. APPENDIX: DATA COLLECTION INSTRUMENTS

Provided as a separate file.

B. Appendix: Due Diligence and Verification Memo

Provided as a separate file.

C. APPENDIX: ENGINEERING DETAILS

The engineering algorithms are presented in this appendix.

Lighting

We began our estimation of lighting end use impacts by applying the set of algorithms shown below.

Appendix Figure 1: Ex Post Algorithms for Lighting End Use

$$Ex\ Post\ kW\ Non-Coincident\ Impactp = Ex\ Ante\ kWp \quad * Ex\ Post\ Adj1_p * Ex\ Post\ Adj2_p$$

$$Ex\ Post\ kWh\ Impact_p = Ex\ Post\ kW\ Non-Coincident\ Impact_p * Ex\ Post\ Hours\ of\ Operation_p * Interactive\ Effects_p$$

Where p=project

The realization rate is calculated using only those surveyed projects as shown below:

$$Prescriptive\ Program\ Gross\ Realization\ Rate = \frac{\sum_{p=1}^{57} Ex\ Post\ kWh_p}{\sum_{p=1}^{57} Ex\ Ante\ kWh_p}$$

The rate is then applied back to the population of projects using the following algorithm.

$$Pescriptive\ Program\ Ex\ Post\ Population\ kWh\ Impact = \sum_{p=1}^{667} Ex\ Ante\ kWh_p * Prescriptive\ Program\ Gross\ Realization\ Rate$$

The Custom Program applied the same algorithms, except with different numbers.

$$Custom\ Program\ Gross\ Realization\ Rate = \frac{\sum_{p=1}^{p=} Ex\ Post\ kWh_p}{\sum_{p=1}^{p=} Ex\ Ante\ kWh_p}$$

$$Custom\ Program\ Lighting\ Gross\ Popluation\ kWh\ Impact = \sum_{p=1}^{p=} Ex\ Ante\ kWh_p * Custom\ Program\ Gross\ Realization\ Rate$$

The ex post demand impact is for a coincident demand and is calculated as:

$$Ex\ Post\ kW_p = Ex\ Post\ kWh\ Impact_p * Coincident\ Factor_p$$

A gross realization rate is calculated as shown for energy and applied identically.

Motors

The engineering estimate for the motors end use is shown below.

Appendix Figure 2. Ex Post Algorithms for Motors End Use

$$Ex\ Post\ kW\ per\ Motor_m = Horsepower_m * Load\ Factor_m * 0.746 * \left(\frac{1}{Base\ Efficiency_m} - \frac{1}{Post\ Efficiency_m}\right)$$

$$Ex\ Post\ kW\ Impact = \sum_{m=1}^{n} Ex\ Post\ kWh_m * Coincident\ Factor_m$$

$$Ex\ Post\ kWh\ Impact = \sum_{m=1}^{n} Ex\ Post\ kW\ per\ Motor_m * Number\ of\ Motors_m * Operating\ Hours_m$$

Where m=motor, and Load Factor =0.75

Net-To-Gross

The net-to-gross factor was calculated as shown in the algorithm below.

Appendix Figure 3. Basic Net to Gross Algorithm for Prescriptive and Custom Projects

$$NTGR = Average\ of\ Influence\ (Program\ components, program\ timining, and\ direct\ influence)$$

$$Influence\ of\ program\ components = Max\ value\ from\ 4\ components\ (1.incentive\ amount, 2.information\ from\ utility\ or\ program\ marketing\ materials, 3.program\ staff\ recommendation, 4.recommendation\ by\ utility\ account\ executive)$$

$$Influence\ of\ Program\ Timing = prorated\ value\ based\ on\ indication\ of\ when\ measures\ may\ have\ been\ installed\ without\ the\ program$$

$$Direct\ Influence = Value\ from\ respondent\ that\ is\ cut\ in\ half\ if\ they\ indicate\ that\ they\ learned\ about\ the\ rebate\ after\ installing\ the\ measures$$

D. APPENDIX: REFERENCE DOCUMENTS

Provided as a separate document.