AMEREN ILLINOIS UTILITIES 2008-2010 ACT ON ENERGY BUSINESS PROGRAM EVALUATION WORK PLAN – PY2

Final

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1. BACKGROUND

In May 2009, Opinion Dynamics Corporation – along with subcontractors Summit Blue Consulting, a subsidiary of Navigant Consulting, Itron, and Michaels Engineering – delivered to Ameren Illinois Utilities (AIU) the final Evaluation Work Plan for the 2008-2010 Act on Energy Business Program ("PY1 Work Plan"). The PY1 Work Plan provided our detailed approach, schedule, and budget for the evaluation of the three active Act on Energy Business programs for Program Year 1: the Prescriptive Incentive Program, the Custom Incentive Program, and the Retro Commissioning Program. In addition, the plan included broad evaluation plans for PY2 or PY3 for those portfolio programs that had not been fully implemented at the time of the PY1 evaluation. This document is the successor to the PY1 Work Plan and provides our detailed approach, schedule, and budget for the PY2 evaluation of the Act on Energy Business portfolio. It also provides the anticipated budget for PY3.[1]

Similar to the PY1 evaluation approach, the PY2 evaluation will include a process evaluation of all active programs while the impact evaluation will focus on the programs accounting for the top 85% of ex ante savings at the portfolio level. Table 1 shows that, as of December 22, 2009, the three Act on Energy Business programs evaluated in PY1 again accounted for a vast majority (95%) of ex-ante energy savings: the Prescriptive Incentive Program, the Custom Incentive Program, and the Retro Commissioning Program. The impact evaluation will therefore focus on these three programs.[2] The Small Business HVAC program only accounts for 5% of portfolio savings; we will therefore only conduct a limited process evaluation for this program. Additional business initiatives include the Demand Credit Program and the On-line Store, which is part of the Prescriptive Incentive Program. Ex-ante savings associated with these programs will be considered in our evaluation. However, we will not conduct impact or process evaluations for these efforts.

[1] The PY3 budget includes evaluation activities for two new program initiatives expected to start in PY3: the roll-out of the Commercial New Construction Program and the expansion of the Retro Commissioning program into the healthcare sector. The budget assumes that we will conduct a process evaluation for all active programs and an impact evaluation for the programs accounting for the top 85% of portfolio savings.

[2] While this data is for only the first half of the program year, we have no reason to believe that there will be substantive changes as PY2 implementation progresses. As such, we don't believe that our plan of performing impact assessments on only these three programs would change.

Table 1. PY2 Ex Ante Gross Savings by Program as of 12/22/09

Program	Projects	Ex Ante kWh Savings*	Percent of Total
Prescriptive	Standard Lighting	22,374,902	39%
	Standard Refrigeration	472,712	1%
	Standard HVAC	348,190	1%
	Standard Grocery	52,900	0%
	Standard Motor	5,067	0%
	Subtotal of Prescriptive	*23,253,770*	*41%*
Custom	Custom	16,813,023	30%
Retro Commissioning	Compressed Air	13,513,229	24%
	Healthcare**	–	0%
Small Business HVAC	Small Business HVAC	3,108,559	5%
	Total as of 12/22/09	**56,688,581**	

*Includes the following project statuses: pre-approved, under review, check queued, and check cut.

**As of 12/22/09, AIB lists one project but no savings for RCx projects in the healthcare sector. Evaluation of Retro Commissioning projects in the healthcare sector is anticipated for PY3.

The PY2 evaluation will focus on the following overall evaluation objectives:

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 Implementer – through due-diligence audits and inspections of a sample of project documentation and sites, respectively;
3. Suggest improvements to the design and implementation of existing and future Programs through process evaluations; and
4. Support AIU 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.

Section 2 below provides the detailed evaluation approach for the PY2 evaluation of the Act on Energy Business portfolio. The section is organized by the five evaluation tasks outlined in our contract:

- Task 1 – Develop Portfolio/Program Evaluation Work Plans
- Task 2 – Establish Verification & Due Diligence Procedures for Implementer
- Task 3 – Review Implementer's Tracking Systems and Program Theories
- Task 4 – Implement Work Plans
- Task 5 – Project Management

Section 3 presents the schedule and budget for PY2 evaluation activities.

For additional background information on evaluation methodologies, data sources, and sampling please refer to the PY1 Work Plan.

2. DETAILED WORK PLAN

2.1 Task 1 – Develop Portfolio/Program Evaluation Work Plans

The outputs of this task are the previously delivered PY1 Work Plan, this document, and any future updates. It should be noted that we might make adjustments to this plan – in coordination with and after approval from AIU staff – should early evaluation activities indicate the need for a shift in evaluation priorities.

2.2 Task 2 – Establish Verification & Due Diligence Procedures for Implementer

The PY1 evaluation included a review of verification and due diligence procedures for the two largest programs in the Act on Energy Business portfolio: the Prescriptive Incentive Program and the Custom Incentive Program. This review also included a comparison of program procedures with industry best practices for this type of C&I incentive programs. Our findings were summarized in a report delivered in June 2009.

The PY2 evaluation will include a review of verification and due diligence procedures for the Retro Commissioning Program. This task will rely primarily on in-depth interviews with program and implementation staff and review of program materials. In addition, we will reconsider the need for updating the PY1 deliverable for this task, *should significant changes in the implementation of the Prescriptive and Custom incentive programs occur*.

2.3 Task 3 – Review Implementer's Tracking Systems and Program Theories

The PY1 evaluation included a review of the AIB Tracking database. Our findings were summarized in a memorandum delivered in May 2009. In PY2, the process component will include an ongoing review of AIB to ensure the tracking data systems are populated in a complete and consistent manner.

There are no program logic models for the programs under assessment in PY2. While we believe that discussion and development of a sound program theory and logic model can benefit the program, this activity is not planned for PY2, given the limited evaluation resources available. Evaluators will explore elements of the underlying program theory during depth interviews with program staff and implementers. Information gleaned from these discussions will inform the overall process evaluation effort.

2.4 Task 4 – Implement Work Plans

This section covers the detailed evaluation activities we plan for PY2.

2.4.1 C&I Prescriptive Incentive Program

Process Evaluation

We anticipate that the PY2 process evaluation will address the following five research topics. For each topic, more specific questions to guide our research are provided. It should be noted that all five topics might not be explored to the same extent. Following PY2 "check-in" interviews with program managers and implementers, we will prioritize our process evaluation efforts and might add topics of particular interest to program staff or drop topics not deemed a priority for PY2.

1. Program Participation
    a. What does customer participation look like? How many projects were completed? By how many different customers? What type of projects? In what business sectors?
    b. Does customer participation meet expectations? If not, how is it different from expectations and why? Is the mix of customers and projects typical for this type of program? Are any changes in the mix of customers and projects desirable?
    c. What does market actor participation look like? How many market actors have joined the Trade Ally Network? What are their areas of expertise? What business sectors do they work in? How many different market actors have implemented projects through the program? What motivates market actors to participate in the program?
    d. Does market actor participation meet expectations? If not, how is it different from expectations and why?
    e. What are barriers to participation (customer and market actor), and how can they be overcome?
    f. How effective is the on-line store in increasing participation in the program and program savings?
2. Effectiveness of Program Design and Implementation
    a. Is the program design effective in meeting the program's goals? Are the best available delivery channels used?
    b. Has the program as implemented changed compared to PY1? If so, how, why, and was this an advantageous change?
    c. What implementation challenges have occurred in PY2 and how have they been overcome?
    d. How well does data tracking work? Does the implementer provide information to AIU in a timely fashion? Are all necessary data tracked and easily provided?

3. Effectiveness of Program Processes
    a. Have the participation processes and program requirements been clearly explained to customers and trade allies?
    b. Does the program smoothly provide incentives to customers? Do program processes create any barriers to customer participation? If yes, what barriers?
    c. Does the program outreach increase awareness of the program opportunities? What is the format of the outreach? How often does the outreach occur? Who does it target? Are the messages within the outreach clear and actionable?
4. Customer Experience and Satisfaction with the Program
    a. Are customers satisfied with the aspects of the program in which they have been involved?
    b. Are customers aware of how to lodge an inquiry or a complaint? How frequently are these mechanisms used, and what types of inquiries or complaints are being received? How quickly are responses provided/issues resolved?
5. Opportunities for Program Improvement
    a. What areas could the program improve to create a more effective program for customers and help increase the energy and demand impacts?
    b. How could trade allies be better supported to more effectively promote the program?

To answer the process questions outlined above, we will conduct the following evaluation activities:

- **Review of Program Materials and Data.** The evaluation team will conduct an extensive review of program data and materials, including all materials provided to participating customers and all customer and trade ally outreach and marketing materials. Additionally, we will review program implementation and marketing plans, as well as quality assurance and program tracking procedures. These activities will inform our process assessment and guide our interviews with program staff and implementers.
- **Program Staff and Implementer Interviews (n=3).** We will conduct interviews with program staff and implementers to understand changes made to the program for PY2. The interviews will also cover the on-line store as well as any strategic initiatives that may have been implemented in PY2. We will also discuss evaluation priorities, if any, that program and implementation staff may have.
- **Participating Customer Interviews (n~100).** The evaluation team will conduct quantitative telephone interviews with customers who have participated in the program in PY2. These interviews will focus on program processes and satisfaction and will also collect impact related information. The sample design is chosen to support the impact analysis. The number of interviews will depend on the level of participation in PY2 but

will be sufficiently large to provide 90±10 precision in the impact values. For budgeting purposes, we assume that we will conduct approximately 100 interviews. We will employ a stratified random sampling approach, which will include an attempted census of the largest savers and a random sample of the strata with the smaller projects.

- **Non-Participating Customer Interviews (n=70).** We will conduct quantitative telephone interviews with customers who did not participate in the program in either PY1 or PY2. These interviews will provide insights into important issues such as program awareness, barriers to participation, motivating factors, baseline energy efficiency behavior, and the potential presence of non-participant spill-over. We will conduct 70 interviews with a random sample of non-participating customers to be drawn from AIU's customer database.

Some of the planned data collection activities are expected to overlap with the Custom program. We will therefore ensure that our data collection instruments address both programs, where needed, and that our sampling strategies for the two programs are coordinated.

Impact Evaluation

The impact evaluation will determine PY2 ex-post net savings for the program and the portfolio and compare these to PY2 goals. The PY2 impact evaluation will answer the following questions:

1. What are the gross impacts from this program?
2. What are the net impacts from this program?
    a. To what degree has the program influenced participating customers' decisions to install energy efficient equipment?
    b. Has the experience of participating in AIU's program led the participant to adopt other energy efficiency measures in their facilities without receiving a rebate? How significant are the savings from these adoptions?
3. Did the program meet its energy goals? If not, why not? What was the demand impact?

Ex-Post Gross Savings Impacts

Available methods for estimating gross savings range from end-use monitoring to calibrated simulation models, calibrated engineering analysis, engineering review, and billing analysis. Factors that must be considered in matching these approaches to different measures include the size of the expected impact, the degree of site-by-site variation in per unit savings, the aggregate size of the measure's impact at the program level, the cost of applying the savings estimation method, the sampling size and associated sampling error (if sampling occurs), and the reliability of the measured data.

Prescriptive measures incented during PY2 include lighting, refrigeration, HVAC, grocery, and motors. The following general approaches will be used for the impact analyses for

these measures:

- Lighting measures – Lighting measures generally fall into the category of lower performance uncertainty and variability and can thus be examined with basic engineering algorithm based models using baseline and measure performance characteristics, operating hours and other adjustment factors. Data resources will include findings from phone surveys (measure counts, installation rates, and run-time hours) and on-site inspections for the largest projects.

- Refrigeration/grocery measures – The refrigeration measures included in the program are relatively constant load/constant output technologies that are typically located in climate-controlled indoor environments, and can thus be analyzed with algorithm-based engineering models. The primary inputs to the models will be participation data, self-reported as-installed characteristics from phone surveys.

- HVAC measures – As a general guide, HVAC measures are more time and performance variable due to weather and internal load dependences and need to be analyzed with tools that take this variation into account. For a sample of PY2 HVAC projects, HVAC equipment replacement measures will be analyzed with engineering algorithms that pull weather data into the estimates (e.g. the bin-method).

- Motors measures – Motor measures include high-efficiency motors and variable-speed drive motor controls. The inputs to the engineering models for both high-efficiency motors and variable speed drive controls will be participation data, phone survey findings regarding as installed conditions (nameplate data, hours of use, baseline equipment data, etc.) and secondary information.

The PY1 evaluation included a review of the TRM assumptions and algorithm for all measures incented during the first program year. The PY2 TRM review will include any new measures added to the TRM for PY2 and any measures that have been incented in PY2 that were not previously assessed. We will, to the extent possible, provide recommendations for going forward values to include in the TRM based on the on-site data collection that will be completed in support of the impact evaluation. Specifically, we will concentrate any effort to provide revised TRM values on lighting hours of use as the PY1 evaluation demonstrated the greatest variance between TRM values and self-reported participant data for this measure. To update the TRM lighting hours of use values for specific space types (i.e. commercial office, retail, etc), we will attempt to leverage the custom measure site-visits to install lighting loggers to collect actual lighting hours-of-use data from AIU customers. Loggers will only be installed for space types where sample sizes are sufficient to derive results that are representative of the population.

Based on the TRM review, we will make any necessary adjustments to program estimated (ex ante) gross savings. Adjustments might be made as a result of revised TRM assumptions or algorithms, or if the application of TRM values in program savings calculations is found to be inconsistent or incorrect.

To estimate PY2 ex-post gross savings, we will utilize the **telephone survey of program participants** (see description above) to verify installed measure inventory and

characteristics, hours of operation, and characteristics of replaced equipment for a sample projects. These data will be used in conjunction with basic engineering algorithm based models to estimate ex-post gross savings.

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Ex-Post Net Savings Impacts

Our determination of new savings will include consideration of both free ridership and spillover.

The net-to-gross (NTG) value for free ridership will be calculated using either the Basic rigor NTG method or the Standard rigor NTG method, based on their size and strategic importance.

- **Basic rigor method.** The Basic rigor method uses a standard scoring algorithm which calculates and averages three scores from data obtained through the self-report phone surveys. These are: (1) a timing and selection score, (2) a program influence score, and (3) a no-program score. The latter captures the likelihood of various actions the customer might have taken if the program had not been available. Smaller, simpler projects will receive this type of analysis.
- **Enhanced rigor method.** The Enhanced method uses the same information as the Basic rigor method, but collects additional data from program participants and also collects qualitative data from additional sources (e.g., utility account managers or market actors who were involved in project implementation). This allows for a "triangulation" of results to establish each sampled project's net-to-gross ratio. The largest projects will receive this type of analysis.

Spillover will be investigated and calculated only in cases where two conditions are met: (1) significant savings impacts are expected, and (2) the customer has indicated that the level of program influence in their decision making was significant. Any significant participant spillover findings from the phone surveys are passed back to the evaluation engineer for further investigation and analysis. The results of this process are reflected in upward revisions to net savings impact estimates.

For both free ridership and spillover, the primary data sources are:

- **Participating customer survey:** This quantitative survey contains a battery of questions to establish free ridership levels to support the calculation of net savings, and a separate question sequence to support an estimate of participant spillover.
- **For customers with an enhanced rigor method, additional data sources are:**
    - **Trade ally survey:** For projects in which the customer indicates significant trade ally influence in their decision to install the energy efficiency measure(s), the trade ally(ies) are also interviewed to determine their level of influence. In addition, they are asked about their sales of program measures before and after the program inception, and this is used to determine the program's effect on

measure adoption.

- **Utility account representative interviews:** Account representatives are interviewed to learn about the project history and their role in project inception.

Table 2 summarizes the PY2 research activities planned for the Prescriptive Incentive Program.

Table 2. Summary of PY2 Research Activities – Prescriptive Incentive Program

Research Activity	Evaluation Component	Sample Size
Review of program information	Process	–
In-depth interviews with program staff	Process	3
Review of program tracking database	Process	–
CATI survey interviews with participants	Process & NTG & Gross Impacts	100
CATI survey interviews with non-participants	Process	70
TRM review	Gross Impacts	–
Engineering estimates of savings	Gross Impacts	–
In-depth interviews with trade allies	NTG	TBD
In-depth interviews with account managers	NTG	TBD

Reporting

The PY2 report will follow the outline established for PY1.

2.4.2 C&I Custom Incentive Program

Process Evaluation

We anticipate that the PY2 process evaluation will address the following five research topics. For each topic, more specific questions to guide our research are provided. It should be noted that all five topics might not be explored to the same extent. Following our PY2 "check-in" interviews with program managers and implementers, we will prioritize our process evaluation efforts and might add topics of particular interest to program staff or drop topics not deemed a priority for PY2.

1. Program Participation
    a. What does customer participation look like? How many projects were completed? By how many different customers? What type of projects? In what business sectors?
    b. Does customer participation meet expectations? If not, how is it different from expectations and why? Is the mix of customers and projects typical for this type of program? Are any changes in the mix of customers and projects desirable?
    c. What does market actor participation look like? How many market actors have joined the Trade Ally Network? What are their areas of expertise? What business sectors do they work in? How many different market actors have implemented projects through the program? What motivates market actors to participate in the program?
    d. Does market actor participation meet expectations? If not, how is it different from expectations and why?
    e. What are barriers to participation (customer and market actor), and how can they be overcome?
2. Effectiveness of Program Design and Implementation
    a. Is the program design effective in meeting the program's goals? Are the best available delivery channels used?
    b. Has the program as implemented changed compared to PY1? If so, how, why, and was this an advantageous change?
    c. What implementation challenges have occurred in PY2 and how have they been overcome?
    d. How well does data tracking work? Does the implementer provide information to AIU in a timely fashion? Are all necessary data tracked and easily provided?
3. Effectiveness of Program Processes
    a. Have the participation processes and program requirements been clearly explained to customers and trade allies?
    b. Does the program smoothly provide incentives to customers? Do program processes create any barriers to customer participation? If yes, what barriers?
    c. Does the program outreach increase awareness of the program opportunities? What is the format of the outreach? How often does the outreach occur? Who does it target? Are the messages within the outreach clear and actionable?
4. Customer Experience and Satisfaction with the Program
    a. Are customers satisfied with the aspects of the program in which they have

been involved?

b. Are customers aware of how to lodge an inquiry or a complaint? How frequently are these mechanisms used, and what types of inquiries or complaints are being received? How quickly are responses provided/issues resolved?

5. Opportunities for Program Improvement

a. What areas could the program improve to create a more effective program for customers and help increase the energy and demand impacts?

b. How is the program addressing the difficult economic conditions and how could it be modified to further assist customers in achieving energy savings?

c. How could trade allies be better supported to more effectively promote the program?

To answer the process questions outlined above, we will conduct the following evaluation activities:

- **Review of Program Materials and Data.** The evaluation team will conduct an extensive review of program data and materials, including all materials provided to participating customers and all customer and trade ally outreach and marketing materials. Additionally, we will review program implementation and marketing plans, as well as quality assurance and program tracking procedures. These activities will inform our process assessment and guide our interviews with program staff and implementers.
- **Program Staff and Implementer Interviews (n=3).** We will conduct interviews with program staff and implementers to understand changes made to the program for PY2. The interviews will also cover the on-line store as well as any strategic initiatives that may have been implemented in PY2. We will also discuss evaluation priorities, if any, that program and implementation staff may have. These may be done in conjunction with the prescriptive interviews as the implementer is the same firm.
- **Participating Customer Interviews (n~70).** The evaluation team will conduct quantitative telephone interviews with customers who have participated in the program in PY2. These interviews will focus on program processes and satisfaction and will also collect impact related information. The sample design is chosen to support the impact analysis. The number of interviews will depend on the level of participation in PY2 but will be sufficiently large to provide 90±10 precision in the impact values. For budgeting purposes, we assume that we will conduct up to 70 interviews. We will employ a stratified random sampling approach, which will include an attempted census of the largest savers and a random sample of the strata with the smaller projects.
- **Non-Participating Customer Interviews (n=70).** We will conduct quantitative telephone interviews with customers who did not participate in the program in either PY1 or PY2. These interviews will provide insights into important issues such as program awareness, barriers to participation, motivating factors, and baseline energy efficiency behavior. This survey will be conducted jointly for the Prescriptive and Custom programs.

Many of the planned data collection activities are expected to overlap with the Prescriptive program. We will therefore ensure that our data collection instruments address both programs, where needed, and that our sampling strategies for the two programs are coordinated.

Impact Evaluation

The impact evaluation will determine PY2 ex-post net savings for the program and the portfolio and compare these to PY2 goals. The PY2 impact evaluation will answer the following questions:

1. What are the gross impacts from this program?
2. What are the net impacts from this program?
    a. To what degree has the program influenced participating customers' decisions to install energy efficient equipment?
    b. Has the experience of participating in AIU's program led the participant to adopt other energy efficiency measures in their facilities without receiving a rebate? How significant are the savings from these adoptions?
3. Did the program meet its energy goals? If not, why not? What was the demand impact?

Ex-Post Gross Savings Impacts

Available methods for estimating gross savings range from end-use monitoring to calibrated simulation models, calibrated engineering analysis, engineering review, and billing analysis. Factors that must be considered in matching these approaches to different measures include the size of the expected impact, the degree of site-by-site variation in per unit savings, the aggregate size of the measure's impact at the program level, the cost of applying the savings estimation method, the sampling size and associated sampling error (if sampling occurs), and the reliability of the measured data.

In PY2 our approach for determining gross savings for custom projects will primarily rely on **on-site audits** for sample custom applications. We will conduct a total of 40 on-site audits as we expect this sample size is sufficient to provide 90±10 precision for our ex-post gross impact estimates. The scope of each audit will be tailored to the specific measures installed at the site. We will develop our site visit sample in two waves using the program tracking database as a sample frame. The first wave will include projects completed in the first half of PY2 (June 1 – December 31, 2009). The second wave will include projects completed between January 1 and May 31, 2010. For each wave, we will stratify the custom projects included in the AIB database in terms of ex-ante savings and select the largest 20 projects. As noted above, we will seek all appropriate opportunities to leverage the site-visits to install lighting loggers to collect actual information on lighting hours-of-use.

If it is determined that our site visit sample size is not sufficient to provide 90±10 precision for our ex-post gross impact estimates we will conduct an **engineering desk review** of a small sample of applications. We will utilize the same stratified sample design described

above for the site visit effort and select the largest remaining custom applications for desk review after developing the site visit sample. If necessary, we will complete only as many desk reviews as is necessary to provide the required precision for our impact estimates when combined with our site visit results.

Ex-Post Net Savings Impacts.

Data requirements for the net-to-gross (NTG) analysis for custom programs will be the same as those for prescriptive projects described in Section 2.4.1 above.

Table 3 summarizes the research activities planned for the Custom Incentive Program.

Table 3. Summary of Research Activities – Custom Incentive Program

Research Activity	Evaluation Component	Sample Size
Review of program materials	Process	–
In-depth interviews with program staff	Process	3
Review of program tracking database	Process	–
CATI survey interviews with participants	Process & NTG	70
CATI survey interviews with non-participants	Process	70
Engineering desk review	Gross Impacts	TBD
On-site visits	Gross Impacts	40
Engineering estimates of savings	Gross Impacts	–
In-depth interviews with trade allies	NTG	TBD
In-depth interviews with utility account representatives	NTG	TBD

Reporting

The PY2 report will follow the outline established for PY1.

2.4.3 C&I Retro Commissioning Program

During the first six months of PY2, the main project activity for the retro commissioning program was in the compressed air sector. As a result, the PY2 evaluation of this program will focus on compressed air. Retro commissioning projects in healthcare sector will be included in the PY3 evaluation.

Process Evaluation

This program took longer to ramp up due to the need to identify, recruit, and train commissioning professionals. As such, a very limited process evaluation was performed in

PY1. The PY2 process evaluation will focus on an assessment of the trade ally outreach.

We will address the following research topics:

1. Program Participation
    a. What does customer participation look like? How many projects were completed? By how many different customers? In what business sectors?
    b. Does customer participation meet expectations? If not, how is it different from expectations and why? Is the mix of customers and projects typical for this type of program? Are any changes in the mix of customers and projects desirable?
    c. How many retro commissioning service providers (RSPs) have been recruited and trained? What are their areas of expertise? What business sectors do they work in? How many different RSPs have implemented projects through the program? What motivates them to participate in the program?
2. Effectiveness of Program Design and Implementation
    a. Is the program design effective in meeting the program's goals? Are the best available delivery channels used?
    b. What implementation challenges have occurred in PY2 and how have they been overcome?
    c. How well does data tracking work? Does the implementer provide information to AIU in a timely fashion? Are all necessary data tracked and easily provided?
3. Effectiveness of Program Processes
    a. Have the participation processes and program requirements been clearly explained to customers and RSPs?
    b. Does the program smoothly provide incentives to customers? Do program processes create any barriers to customer or RSP participation? If yes, what barriers?
    c. Does the program outreach increase awareness of the program opportunities? What is the format of the outreach? How often does the outreach occur? Who does it target? Are the messages within the outreach clear and actionable?
4. RSP Experience and Satisfaction with the Program
    a. Are RSPs satisfied with the aspects of the program in which they have been involved?
5. Opportunities for Program Improvement
    a. What areas could the program improve to create a more effective program for customers and help increase the energy and demand impacts?
    b. How is the program addressing the difficult economic conditions and how

could it be modified to further assist customers in achieving energy savings?

c. How could RSPs be better supported to more effectively promote the program?

To answer the process questions outlined above, we will conduct the following evaluation activities:

- **Review of Program Materials and Data.** The evaluation team will conduct an extensive review of program data and materials, including all materials provided to participating customers, any materials used to train RSPs, and all customer and RSP outreach and marketing materials. Additionally, we will review program implementation and marketing plans, as well as quality assurance and program tracking procedures. These activities will inform our process assessment and guide our interviews with program staff and implementers.
- **Program Staff and Implementer Interviews (n=2).** We will conduct in-depth interviews with program staff and implementers to understand changes made to the program for PY2. We will also discuss evaluation priorities, if any, that program and implementation staff may have.
- **RSP Interviews (n=5).** We will conduct in-depth interviews with up to five RSPs who have been recruited and trained for the retro commissioning program. These interviews will address a range of questions related to program processes and effectiveness, as outlined above.

Impact Evaluation

The energy impacts from the compressed air systems that underwent retro commissioning will be based on engineering algorithms informed by onsite data.

There are two mechanisms whereby energy is saved in compressed air systems via RCx – leak reduction and use optimization. Reducing leaks permits 1) reduced volume of compressed air to be created and 2) reduced operating pressures. Both of these reduce the energy used by the compressor. Use optimization relates to operating at the appropriate pressures, isolating idle processes, having adequate storage, and avoiding wasteful processes. The same benefits apply.

The best way to assess savings from RCx of compressed air systems is through pre- and post-RCx end-use data either from data logging or site trend data. However, most compressed air systems are un-monitored unless they are in large industrial settings. The next best set of data is from compressor power and airflow after the RCx occurs. We will collect compressor power through two weeks of data measurement. Airflow measurement requires more instrumentation than we can cost-effectively install. As such our plan is to perform onsite audits, gather some static data, and attach one or more data loggers to obtain compressor power over a two-week period. During each on-site audit we will:

- Obtain nameplate information on horsepower, design pressure range, compressor type, voltage and full-load amps;

- Discuss operating data – including pressure set point, hours of operation, and typical end-uses – with the site engineer to allow us to estimate air flow; and
- Set up a data logger on the compressor(s) to obtain ½ hour interval data and return back in two weeks to retrieve the data logger.

While not expected, it is possible that more detailed information is available. We will determine if monitored and trended data are available. If so, we will use the most detailed information available. For example, we would want compressor power, air dryer power, and air flow at ¼, ½ or 1 hour intervals for at least two weeks. If these types of data are available, we would use that rather than perform our own data monitoring.

We will use the estimated savings to determine the sample for the onsite audits. We have budgeted for 16 onsite audits and monitoring, which should be sufficient for 90/10 precision. We will use a stratified sample for the top tier of sites (those with higher energy savings) while the lower tier of sites (those with less energy savings) would be randomly sampled.

Table 4 summarizes the research activities planned for the Retro Commissioning Program.

Table 4. Summary of Research Activities – Retro Commissioning Program

Research Activity	Evaluation Component	Sample Size
Review of program materials	Process	–
Depth interviews with program staff	Process	2
Review of program tracking database	Process	–
Review of verification & due diligence procedures	Process	–
Depth interviews with RSPs	Process	up to 5
Onsite Audits of RCx sites	Impact	16

Reporting

There will be a single report for the portfolio of programs. Reporting for this program will follow the format used for the PY1 evaluations of the Prescriptive and Custom programs.

2.4.4 Small Business HVAC Program

Based on participation data as of December 2009, the Small Business HVAC program accounted for approximately 5% of C&I portfolio savings. As a result, the PY2 evaluation of this program will only include a limited process evaluation.

Process Evaluation

The process evaluation we will address the following research topics:

1. Program Participation
    a. What does customer participation look like? How many projects were completed? By how many different customers? In what business sectors?
    b. Does customer participation meet expectations? If not, how is it different from expectations and why? Is the mix of customers typical for this type of program? Are any changes in the mix of customers and projects desirable?
    c. What does market actor participation look like? How many different market actors have implemented projects through the program? What motivates market actors to participate in the program?
2. Effectiveness of Program Design and Implementation
    a. Is the program design effective in meeting the program's goals? Are the best available delivery channels used?
    b. What implementation challenges have occurred in PY2 and how have they been overcome?
    c. How well does data tracking work? Does the implementer provide information to AIU in a timely fashion? Are all necessary data tracked and easily provided?
3. Effectiveness of Program Processes
    a. Have the participation processes and program requirements been clearly explained to customers and trade allies? Do program processes create any barriers to customer or trade ally participation? If yes, what barriers?
    b. Does the program outreach increase awareness of the program opportunities? What is the format of the outreach? How often does the outreach occur? Who does it target? Are the messages within the outreach clear and actionable?
4. Trade Ally Experience and Satisfaction with the Program
    a. Are trade allies satisfied with the aspects of the program in which they have been involved?
5. Opportunities for Program Improvement
    a. What areas could the program improve to create a more effective program for customers and help increase the energy and demand impacts?
    b. How could trade allies be better supported to more effectively promote the program?

To answer the process questions outlined above, we will conduct the following evaluation activities:

- **Review of Program Materials and Data.** The evaluation team will conduct a review of program data and materials, including all materials provided to participating customers, any materials used to train trade allies, and all customer and trade ally outreach and marketing materials. Additionally, we will review program implementation and marketing plans, as well as quality assurance and program tracking procedures. These activities will inform our process assessment and guide our interviews with program staff and implementers.
- **Program Staff and Implementer Interviews (n=2).** We will conduct in-depth interviews with program staff and implementers to better understand program design and implementation and to identify program strength and potential areas of improvement. We will also discuss evaluation priorities, if any, that program and implementation staff may have.
- **Trade Ally Interviews (n=5).** We will conduct in-depth interviews with up to five trade allies who have participated in the program. These interviews will address a range of questions related to program processes and effectiveness, as outlined above.

2.5 Task 5 – Project Management

As part of the project management and reporting tasks, the ODC Team will conduct bi-weekly conference calls with AIU. These calls are designed to keep the AIU project manager informed of progress during the past period, resolve issues, and coordinate upcoming activities. The calls will include key team members involved in activities on the critical path. They will be initiated by Mr. Norton and may use Internet Go-to-Meetings as a way to discuss written items such as surveys. This project management tool has been very effective in (1) ensuring project continuity; (2) developing ongoing mutual understanding of the project's progress; and (3) identifying future project issues and resolutions.

In addition to conference calls, written status reports will be prepared and delivered each month. These status reports will coincide with the invoicing period and will include the following elements:

(1) summary of accomplishments in period (previous month);
(2) survey disposition (if appropriate);
(3) outstanding data requests;
(4) near-term activities/plans (following month);
(5) commentary on tasks progress, issues, and solutions; and
(6) variances in schedule and commentary on variances (including timeline).

Key members of the team will attend in person the project initiation and final "close-out" meetings as well as all important meetings in between. While our team is located throughout the nation, we will be in Illinois when needed.

3. SCHEDULE & BUDGET

Table 5 outlines the schedule of PY2 evaluation activities.

Table 5. Schedule of PY2 Evaluation Activities

Evaluation Tasks	Schedule
Develop Evaluation Plan	12/09 – 1/10; Finalized Plan 2/10
Data Collection	2/10 – 6/10
Analysis of Process and Impact Data	4/10-7/10
Draft Annual Report I	8/10
Final Annual Report I	9/10

The specific date for key deliverables is presented in Table 6.

Table 6. Date of Key Deliverables

Deliverable	Schedule
Monthly Updates	On the 10th business day of each month
Quarterly Updates	10 days after close of Quarter
Ad-hoc	As needed
Draft Annual Report I	Delivered
Final Annual Report I	Delivered
Draft Annual Report II	8/10
Final Annual Report II	9/10
Draft Annual Report III	8/11
Final Annual Report III	9/11
Final Project Report—Draft	11/11
Final Project Report	2/12

Table 7 presents the estimated evaluation budgets by task and program for PY2 and PY3. These estimates are subject to revisions upon review of program tracking data in PY2 and PY3 and any program design changes.

Table 7. Budgets

Task	Description	PY2	PY3
1	Evaluation Plan	$15,526	$13,075
2	Verification and QA/QC Plan	$5,400	$ -
3	Review Tracking	$9,279	$ -
4	Implement Plan	$ -	$ -
	a. Prescriptive	$81,288	$157,257
	b. Retrocommissioning	$46,101	$ 46,455
	c. New Construction	$ -	$ 42,675
	d. Street Lighting	$ -	$ -
	e. Custom	$102,607	$144,433
	f. Demand Credit	$ -	$ -
5	Management/Status Reports	$31,676	$ 42,026
6	Evaluation Support	$3,856	$ 6,311
Total		$295,733	$452,232