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Multi-Year Evaluation Plan for the Ameren Illinois Company Section 16- 111.5B Programs

Final

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CADMUS

NAVIGANT



MichaelsEnergy

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1. Introduction

This document presents the multi-year evaluation plan for Ameren Illinois Company’s (AIC) residential and business energy efficiency program submissions to the Illinois Power Agency (IPA) pursuant to Section 16-111.5B of the Illinois Public Utilities Act. Opinion Dynamics, along with its subcontractors, The Cadmus Group, Navigant Consulting, and Michael’s Energy (“the evaluation team” or “the team”), have been contracted by AIC to provide an independent evaluation of these IPA¹ electric energy efficiency programs. In this document, we provide a high-level overview of the planned evaluation activities for each program across multiple years.

It is important to note that, at present, we have only developed evaluation plans for those IPA programs offered in PY7 or those offered in AIC’s 8-103/8-104 portfolio that are transitioning to the IPA in PY8. For those programs that begin in PY8 and beyond, we will provide supplemental detailed program year-specific evaluation plans, which we will provide as separate documents. In addition, while the multi-year plan will serve as the foundation of our annual evaluation plans, program and evaluation priorities may change from year to year.

Table 1 summarizes the currently planned IPA programs for the next three program years ranked in terms of expected PY7 electric savings.

Table 1a. IPA Programs and Expected Savings (Busbar) by Year

Program Category	Program Name	PY7 MWh	PY8 MWh	PY9 MWh
PY7 IPA Offering	Small Business Direct Install	30,719	9,588	9,788
	Multifamily Major Measures and Common Area Lighting ^a	14,247	38,943	38,943
	All Electric Homes	11,189	Not Offered	
	Specialty Lighting	5,970		
	Rural Efficiency Kits	3,555	7,876	7,876
8-103/8-104 Transfers	Residential Lighting	Not Offered	48,190	53,556
	Home Energy Reports		40,013	40,013
PY8 IPA Offerings*	Small Business Refrigeration		17,947	17,947
	Demand-Controlled Ventilation		5,318	Not Offered
	Moderate Income Kits		1,567	1,567

* The evaluation team has not yet developed evaluation plans for these programs given that they are not yet operational and therefore, limited information is available about their design and implementation.

^a Note that the PY8 and PY9 savings values are for major measures only.

PY7 Source: Final 2014 IPA Procurement Plan (Filed July 22, 2014), ICC Docket No. 13-0546, p. 87.

<http://www.icc.illinois.gov/downloads/public/edocket/382370.pdf>

PY8 and PY9 Source: Final 2015 IPA Procurement Plan (Filed April 28, 2015), ICC Docket No. 14-0588, p. 76.

<http://www.icc.illinois.gov/downloads/public/edocket/403592.pdf>

¹ Note that the IPA is not involved in the management of these energy efficiency programs.

Table 2b. IPA Programs and Expected Savings (Meter) by Year

Program Category	Program Name	PY7 MWh	PY8 MWh	PY9 MWh
PY7 IPA Offering	Small Business Direct Install	28,670	8,986	9,173
	Multifamily Major Measures and Common Area Lighting ^a	13,289	36,498	36,498
	All Electric Homes	10,437	Not Offered	
	Specialty Lighting	5,569		
	Rural Efficiency Kits	3,316	7,381	7,381
8-103/8-104 Transfers	Residential Lighting	Not Offered	45,164	50,193
	Home Energy Reports		37,500	37,500
PY8 IPA Offerings*	Small Business Refrigeration		16,820	16,820
	Demand-Controlled Ventilation		4,984	Not Offered
	Moderate Income Kits		1,468	1,468

* The evaluation team has not yet developed evaluation plans for these programs given that they are not yet operational and therefore, limited information is available about their design and implementation.

^a Note that the PY8 and PY9 savings values are for major measures only.

PY7 Source: Appendix B-1 to 2014 Procurement Plan (Filed September 20, 2013), ICC Docket No. 13-0546, p. 28, Table 3. <http://www.icc.illinois.gov/downloads/public/edocket/358791.pdf>

PY8 and PY9 Source: Appendix B (Section 16-111.5B submittal) – 2015 Procurement Plan (Filed September 29, 2014), ICC Docket No. 14-0588, p. 18, Table 6. <http://www.icc.illinois.gov/downloads/public/edocket/387624.pdf>

It is important to note that the stand-alone IPA programs are governed by a different set of rules than AIC’s energy efficiency portfolio of residential and commercial programs (referred to as the 8-103 and 8-104 programs per Order 13-0498). In particular, evaluation plans and reports are subject to AIC approval, and in many cases, there are deemed savings values and net-to-gross ratios (NTGRs) specified for these programs.²

Overarching Evaluation Approach

As outlined within the program-specific plans in this document, we will evaluate the portfolio using a number of different data collection strategies and analytic techniques to support the process and impact analyses. In addition, there are a number of overarching resources and directives guiding our work:

- Illinois Statewide Technical Reference Manual for Energy Efficiency (IL-TRM)³ – The evaluation team will use the IL-TRM Version 2.0 dated June 7, 2013 for its impact evaluation efforts, where applicable. We will use this version of the IL-TRM as it was the version available at the time that the PY7 IPA programs were submitted to the Commission in the IPA procurement plan in Docket No. 13-0546.

² PY8 and PY9 IPA Programs are subject to the following evaluation guidelines adopted in ICC Docket No. 14-0588: <http://www.icc.illinois.gov/downloads/public/June%2018%202014%20Consensus%20Language%20for%20Section%2016-111.5B%20Oversight%20and%20Evaluation%20Responsibility%20Energy%20Efficiency%20Issues.pdf>

³ <http://www.icc.illinois.gov/electricity/TRM.aspx>

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However, beginning in PY8, the IPA programs and AIC's 8-103/8-104 programs will be evaluated using the same version of the IL-TRM (i.e., Version 4.0).

- NTGRs –The evaluation team will apply deemed NTGRs by program used in the procurement plan filed in Docket No. 13-0546.
- EM&V Coordination – Where similar programs are offered across utilities, the evaluation team is in ongoing communication with other Illinois evaluators to discuss planned evaluation approaches. These discussions ensure that, where feasible, the evaluation approach is consistent.

The evaluation team will implement the plans contained in this document under a distinct IPA-specific budget. In addition, the team allocated a portion of non-program costs such as evaluation planning and TRM support associated with both the IPA and 8-103/8-104 to the IPA budget.

2. Business Programs

2.1 Small Business Direct Install

The Small Business Direct Install (SBDI) Program, a stand-alone Illinois Power Agency (IPA) energy efficiency program, began as a pilot in PY5 and was launched as a formal program in PY6. Leidos currently implements the program (the “implementation contractor”), which offers AIC business customers in the DS-2 rate code a free energy assessment, as well as the installation of energy-efficient measures. In particular, as of PY6, the program offered a package of free measures, a \$129 premium package, and additional measures that go beyond the premium package. The free package includes CFLs, faucet aerators, low-flow showerheads, and pre-rinse spray valves,⁴ while the premium package includes 42W CFLs, LED exit signs, and lamp/ballast retrofit of up to 80 reduced wattage T8 lamps. The additional measures include occupancy sensors, 8 foot T12 to 4-foot T8 conversion kits, and T12/T8 retrofits exceeding the 80-lamp limit.

Since the program’s launch in PY6, the evaluation team has performed impact evaluation through application of fixed values from Ameren’s IPA filing, as well as onsite verification visits and application review. Further, the team performed a process assessment through telephone surveys with both full program participants (those who received an assessment and installed recommended measures) and partial program participants (those who received the assessment only).

Beginning in PY8, Franklin Energy will take over implementation of the program, and the evaluation team anticipates some program design changes. As a result, the evaluation team will make early feedback a priority in PY8, as well as in PY7 regarding key process issues before the transition.

The following table provides an overview of the evaluation activities planned by year.

Table 3. Planned SBDI Program Evaluation Activities by Program Year

Activity	PY7	PY8	PY9
Program Material Review	X	X	X
Program Manager and Implementer Interviews	X (n=3)	X (n=3)	X (n=3)
Small Business Program Ally (SBPA) Interviews	X (n=20)	X (n=20) ^b	X (n=20) ^b
Participant Survey – Full Participants		Installation Verification, Process & NTG	
Participant Survey – Assessment Only		Process (x=70)	

⁴ The program is electric only and does not claim gas savings associated with water efficiency measures.

Business Programs

Activity	PY7	PY8	PY9
Non-Participant Survey ^a	X (n=200)		
Conversion Rate Analysis		X	X
Verification Site Visits		X (n=40)	
Gross Impact Approach	Application of IL-TRM V2.0/Engineering Analysis	Application of IL-TRM V2.0/Engineering Analysis	Application of IL-TRM V2.0/Engineering Analysis
NTG Impact Approach	Value included in Procurement Plan Filing in ICC Docket No. 13-0546	Deemed NTG value recommended by the evaluation team available prior to the start of PY8 (which may be the Value from Prior Evaluation)	Deemed NTG value recommended by the evaluation team available prior to the start of PY9 (which may be the Value from Prior Evaluation)
Budget	\$86,800	\$200,000	\$56,000

^a In conjunction with the C&I Custom and Standard programs under 8-103/8-104.

^b The total number of interviews may change based on the final design of the PY8/PY9 program.

Below we describe the rationale for our planned activities.

■ Studies by Year

- Given that implementation of this program will change hands at the end of PY7, the team will perform a very limited process assessment, as well as an impact assessment.
 - We will speak with program staff, as well as small business program allies (SBPAs) to document changes in program processes in PY7. In particular, we will explore the expanded role of SBPAs in the assessment process over the past program year. We expect to conduct these interviews in late April/early May 2016.
 - We will also conduct non-participant research to explore barriers to participation among the small business customers targeted by the SBDI Program. We have prioritized this research for PY8 in order to leverage research planned for the ActOnEnergy Business Program and will coordinate the timing of fielding with the other C&I evaluations.
 - To determine program impacts, we will apply the IL-TRM and/or fixed deemed values for program measures to determine the gross impacts for the program. We will also continue to apply the PY6 NTGR per the NTG framework and evaluation team recommendations to the SAG. Given the status of PY7 program activity and the expected date of delivery for the final data, we anticipate conducting this analysis in June 2016.
- The PY8 evaluation will include full process and impact assessments in order to examine any changes in participation, processes or savings due to the change in implementer.
 - Given the change in implementer and likely program delivery, we will gather free ridership and spillover information via telephone surveys with participating customers for use prospectively, and will use the PY6 NTGR per the NTG framework to calculate net impacts for the program. Depending on participation levels in the first part of PY8, we plan to complete an early assessment so that the NTGR is available by March 1, 2017.

- We will utilize surveys with both full participants (those who received an assessment and installed recommended measures) and partial participants (those who received the assessment only) to assess program processes, satisfaction, and barriers to participation. This activity will take place immediately following the close of the program year in June/July 2017.
- We will analyze the program's conversion rate by developing profiles of customers who have completed projects versus those who have only completed an assessment. We will develop the profiles based on data available from AIC and the program implementer, as well as the participant survey, if appropriate. This information will help the program determine whether certain customer characteristics are more frequently associated with participation in the program. The team plans to conduct this activity in July/August 2017, but the timing will depend on when final program-tracking data is available.
- The team will estimate gross savings based on a combination of IL-TRM application and onsite verification visits for a sample of projects to inform installation verification. We have prioritized this research for PY8 given the transition to a new implementation contractor and possibly program design. We will complete this task as soon as the final program-tracking data is available.
- We anticipate that the PY9 evaluation will focus mainly on determining program impacts. However, we may revisit the plan once we know more about the design of the PY8 program implemented by Franklin Energy.

3. Residential Programs

3.1 Multifamily

The IPA Multifamily Program encompasses two program components: common area lighting and major measures. The common area lighting component primarily focuses on replacement of standard efficiency common area lighting with high-efficiency fluorescent lighting, and incandescent and fluorescent exit signs with LED exit signs. The major measures portion of the program offers more expensive complex measures such as central heating, central cooling or programmable thermostats, add insulation, and perform air sealing.

Over the course of the last six program years, the evaluation team has performed both process and impact evaluations of these program components under AIC's energy efficiency portfolio. Impact assessment has involved the application of the IL-TRM algorithms, as well as onsite visits to assess measure installation. The team has also conducted interviews with participating property managers to develop NTGRs for each program component. During the Plan 3 cycle, we will continue to assess program impacts, as well as perform assessments of key process and market issues.

It is important to note that beginning in PY7, components of the Multifamily Program will be implemented within the 8-103 and 8-104 portfolio, and as a stand-alone IPA program. In particular, the major measures component will be implemented within the 8-103 and 8-104 portfolio and the stand-alone IPA program. While the separation of program components across two distinct funding streams is not a problem for evaluation, the team plans to provide separate reports for the IPA and 8-103/8-104 programs and therefore, will not provide overall program savings integrating the two sources in either report.

The following table summarizes planned evaluation activities for the Multifamily Program in PY7 and the Multifamily Major Measures Program in PY8 and PY9.

Table 4. Planned Multifamily Evaluation Activities by Program Year

Activity	PY7 – Major Measures	PY8 – Major Measures	PY9 - Major Measures
Program Material Review	X	X	X
Program Staff Interviews	X (n=2)	X (n=2)	X (n=2)
Participating Trade Ally Interviews	X (n=10)		X (n=10)
Non-Participating Property Manager Survey	Market Characterization (n=50)*		
Property Manager Survey	Market Characterization (n=40)	NTG, Process & Measure Installation (n=40)	
Market Characterization	X		
Gross Impact Approach	Application of IL-TRM V2.0/Engineering Analysis	Application of IL-TRM V4.0/Engineering Analysis	Application of IL-TRM V5.0/Engineering Analysis
Net Impact Approach	Value included in Procurement Plan Filing in ICC Docket No. 13-0546	Deemed NTG value recommended by the evaluation team available prior to the start of PY8 (which may be the Value from Prior Evaluation)	Deemed NTG value recommended by the evaluation team available prior to the start of PY9 (which may be the Value from Prior Evaluation)
Budget**	\$80,000	\$46,000	\$30,000

* The expected number of completes will be refined through the planning process. Based on conversations with the implementation team, we expect that this number may be lower.

** Note that costs for some evaluation activities related to Major Measures is split across 8-103/8-104 and the IPA.

Below we provide the rationale for the proposed evaluation activities.

■ **Studies by Year**

- In PY7, we will focus on exploring the program’s remaining market potential including property managers’ barriers to completing more energy-efficient upgrades.
 - We plan to start the Plan 3 cycle with research to assess the program’s remaining market potential. The study will include an assessment of market size (i.e., number of properties, buildings, and units), geographic distribution, and supply side structure and operations. This effort will involve multiple data collection and analysis activities including a review and analysis of AIC customer data, review of census data, interviews with contractors working in AIC’s service territory, and a survey of property managers on their perceptions of the market for these services. This research will help provide recommendations for the program’s strategic direction that may help to increase the program’s savings potential. The team plans to begin this activity as soon as possible following approval of the plan so that results can help inform planning for PY8 and PY9.
 - We will conduct an engineering analysis based on application of the IL-TRM V2.0 to calculate gross impacts, and will apply in-unit and major measures NTGRs from prior evaluations. We

will complete this task as soon as final program-tracking data becomes available, which is likely in July 2016.

- In PY8, the team will focus on inputs to the impact assessment of the program. In particular, we will prioritize research to inform the development of updated NTGRs, as well as an assessment of measure installation.
 - We will again utilize self-reported data from program managers to update the program's NTGR for use prospectively in PY10. We will review and finalize our approach based on the program's design, as well as coordination across the Illinois evaluation teams on NTG methods. We will field the survey upon receipt of final program-tracking data so that we have the full participant population. We anticipate receipt of this data in early July 2016.
 - Surveys with participating property managers will also provide an opportunity to conduct a targeted process assessment of the program. At a minimum, we will inquire about satisfaction with program implementation and cross-participation between different program components. If feasible, we will also draw upon findings from the market characterization and target property managers in certain geographic areas to see how their experiences with the program may differ.
- In PY9, the final year of the Plan 3 cycle, we anticipate conducting a limited evaluation focused on program impacts. We will also conduct a small number of targeted process activities.
 - Interviews with program staff and participating trade allies in PY9 will help the team gather updated information on program implementation and processes. We anticipate conducting these interviews in the spring of 2018.
 - Although not currently budgeted, depending on the results of the PY7 market characterization and PY8 process research, the team may consider benchmarking the AIC program against other Multifamily programs throughout the country to identify best practices and lessons learned that could enhance implementation of the AIC program.

3.2 All-Electric Homes

The All Electric Homes (AEH) Program is an Illinois Power Agency (IPA) program designed to increase energy savings in all-electric residences. It targets both single-family and multifamily residences with electric heating systems and greater-than-average electricity usage. Beginning in PY7, the program will offer replacement air-source heat pumps and ductless heat pumps to both single-family and multifamily customers. In addition, for single-family customers, the program will offer air sealing and insulation measures. AEH coordinates closely with the Multifamily Program, which provides shell measures and direct install measures for multifamily participants. AEH relies on contractors approved through the HVAC and Home Energy Solutions programs. Conservation Services Group (CSG) implements AEH.

Table 5. Planned All-Electric Homes Evaluation Activities by Program Year

Activity	PY7
Program Material Review	X
Program Manager and Implementer Interviews	X (n=2)
Invoice Review/Analyze Incremental Costs	X (n=240)
Market Actor Interviews	Trade Allies (n=15)
Metering removal from PY6 metering study	X
Gross Impact Approach	IL-TRM Version 2.0 dated June 7, 2013
Net Impact Approach	Value included in Procurement Plan Filing in ICC Docket No. 13-0546
Meter data analysis	X
Budget	\$98,000

The following is our rationale for the approach outlined above.

- **Studies by Year:** We will be updating our PY6 analyses in PY7, particularly the NTG analysis, to account for program design changes since PY6.
 - Our approach in PY7 recognizes the high savings expected from the program, as well as the program’s unique and previously unstudied design.
 - We will base gross savings analysis on algorithms from Version 2.0 of the IL-TRM.
 - We will assess incremental measure costs by reviewing a sample of approximately 30 invoices for each major equipment type and SEER level starting in early summer, 2015.
 - Process evaluation activities in PY7 will focus on the changes to program design. As part of this process, we will interview trade allies during late summer, 2015, who are expected to take on a larger role in marketing the program in PY7. We will also conduct a review of program materials including the program manual, incentive applications, and marketing materials supplied to trade allies or used directly by the program.

3.3 Lighting

As noted in the 8-103/8-104 Evaluation Plan, AIC has designed the Residential Lighting Program to increase awareness and sales of ENERGY STAR lighting among residential customers. The program provides discounts through a variety of retail channels to reduce the cost of CFLs. The program is available throughout the entire AIC service territory through retail stores and an online store.

The program seeks to increase awareness of the energy-efficient lighting and its benefits through marketing and outreach efforts at participating retailers, the AIC website, and the mass media. The program partners with retailers and lighting manufacturers to sell ENERGY STAR lighting at a discount to bring the cost closer to that of traditional incandescent lighting. The discounts encourage customers who are reluctant to pay full price for ENERGY STAR lighting to choose energy-efficient over standard lighting.

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The following table summarizes planned evaluation activities for the PY7 Specialty Lighting Program and the Residential Lighting Program planned for PY8 and PY9.

Table 6. Planned Lighting Evaluation Activities by Program Year

Activity	PY7 – Specialty Lighting	PY8 – Residential Lighting	PY9 - Residential Lighting
Program Material Review	X	X	X
Program Manager and Implementer Interviews	X (n=2-3)	X (n=2-3)	X (n=2-3)
Retailer Interviews (corporate buyers)		X (n=6)	
Customer Intercepts		X (n=1,000)	
In-Home Lighting Saturation and HOU Study		X (n=225)	
Installation and Usage Study		X (n=800)	
Consumer Preference Study		X (n=225)	
Gross Impact Approach	Application of IL-TRM V2.0	Application of IL-TRM V4.0	Application of IL-TRM V5.0
	Participation based on database review, leakage and res/commercial split from PY6 intercepts.	Participation based on database review, leakage and res/commercial split from intercepts.	Participation based on database review, leakage and res/commercial split from PY8 intercepts.
	Application of carryover savings from bulbs purchased in PY5 and PY6.	Application of carryover savings from bulbs purchased in PY6 and PY7.	Application of carryover savings from bulbs purchased in PY7 and PY8.
Net Impact Approach	Deemed NTGR Value of 0.44 used in Procurement Plan Filing in Docket No. 13-0546	Value from Prior Evaluation	Value from Prior Evaluation
Budget	\$32,500	\$370,000	\$40,000

Below we provide the rationale for the proposed evaluation activities.

■ **Studies by Year**

- The PY7 evaluation will be more limited since the evaluation team put substantial effort into the evaluation of this program in PY6.
 - We will use the NTGR of 0.44 because this is the deemed NTGR value used in the procurement plan filed in Docket No. 13-0546.
- The PY8 evaluation will include several tasks that allow us to gauge the state of the lighting market so we can provide guidance on future program directions. It will have been two years since we

have conducted additional research and given the changes taking place in the lighting market, it will be time to update past studies.

- We will use the PY6 NTGR for the program in PY8 per the NTG framework.
- We plan to perform customer intercept interviews in October and November of 2015 to estimate a new NTGR for prospective application in PY9. We will interview all customers purchasing lighting so that we can learn about the types of bulbs that customers are purchasing and the state of the lighting market. While in stores, we will conduct a shelf survey of lighting products for sale and note the presence of program sponsored educational and marketing materials.
- The in-home lighting audits we conducted in 2012 and 2014 revealed that the program has sold more CFLs than we find in AIC homes, sold bulbs to non-AIC customers, or sold bulbs that were installed in commercial spaces. To understand the factors underlying this difference, we will conduct an installation and usage study by conducting follow up interviews with customers we interview as part of the in-store interviews. We will request contact information of all customers so that can conduct short interviews every four months about their lighting usage. We will ask questions about the bulbs they purchased during our in-store interview to learn when they install the bulbs, the reason for installation, and what types of bulbs they replaced. We will also ask about any additional lighting purchases they make between interviews. We will use the results of this study to estimate first year installation rates, inform future program design and marketing, and assess program baselines.
- We will conduct in-home lighting audits in June and July of 2016. We will use the in-home lighting inventories to estimate penetration and saturation rates of different bulb types. The study design will be similar to those we conducted in 2012 and 2014 so that we compare the results and document changes in the market. We will complete approximately 225 total in-home lighting inventories. As part of this study, we will install light loggers on CFLs and LEDs to estimate hours-of-use.
- While conducting the in-home lighting audits, we will ask study participants to complete a short survey addressing past and future lighting purchasing behaviors. Like the study we completed in 2014 for PY6, we will use a discrete choice survey to assess consumer preferences for standard and specialty bulbs. The survey will ask respondents to choose between different hypothetical product options, which will require them to make tradeoffs between price and non-price attributes. The results will shed further light on the state of the energy-efficient lighting market and will inform design and implementation by providing information about customer responsiveness to changes in the price of energy-efficient lighting products.
- The PY9 evaluation will be more limited since the evaluation team will have put substantial effort into the evaluation of this program in PY8.
 - We will use the PY8 NTGR for the program in PY9 per the NTG framework.

3.4 Rural Efficiency Kit Distribution

The Residential Rural Efficiency Kits (Rural Kits) program was implemented for the first time in PY6 as a part of IPA program for school kits. The program provided kits containing energy-efficient items to AIC electric

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customers likely to have all-electric homes, based on customer billing research that identified high electric-use homes.

Rural Kits was first evaluated in PY6, using deemed IPA gross and net per-unit savings to attribute savings to the verified items distributed through the program. Given the small evaluation budget, the team used surveys issued by the implementer to calculate installation rates for application in future program years and the team did not conduct participant surveys or primary NTG research as part of the PY6 evaluation. As a result, the evaluation team will conduct this research in PY7.

Table 7. Planned Rural Kits Evaluation Activities by Program Year

Activity	PY7	PY8	PY9
Program Material Review	X	X	X
Program Manager and Implementer Interviews	X (n=3)	X (n=3)	X (n=3)
Participant Survey	Process, Installation Verification & NTG (n=70)	N/A	Process (n=70)
Gross Impact Evaluation Approach	IL-TRM Version 2.0 dated June 7, 2013	IL-TRM Version 4.0 dated February 24, 2015	IL-TRM Version 5.0
Net Impact Evaluation Approach	Value included in Procurement Plan Filing in ICC Docket No. 13-0546	Deemed NTG value recommended by the evaluation team available prior to the start of PY8 (which may be the Value from Prior Evaluation)	Deemed NTG value recommended by the evaluation team available prior to the start of PY9 (which may be the Value from Prior Evaluation)
Budget	\$38,000	\$15,000	\$30,000

The following is our rationale for the approach outlined above.

- **Studies by Year:** The previous evaluation effort for the Rural Kits Program did not include any primary research and relied upon implementer-delivered participant surveys, deemed per unit gross savings, and deemed per unit net savings values. As such, the evaluation plan for PY7 will include primary research to update NTGR and installation rates.
- In PY7, the evaluation team will focus on assessing program impacts and processes to update NTG and installation rates as well as identifying possible process improvements.
 - The evaluation team will use the program-tracking database to estimate the PY7 *ex post* gross savings for the Rural Kits Program. We will review all data in the program-tracking database, determine electric water heater saturation where possible, apply the SW TRM to estimate gross savings and installation rates, and apply deemed NTG ratios to participants.
 - The evaluation team will field a participant survey in summer, 2015 to assess program processes and experience with the program; preferred methods for receiving energy efficiency information; actions taken; key demographics; household characteristics; installation of measures, i.e., number of measures received and installed; free ridership; and, spillover. We plan to complete enough interviews with program participants to provide statistically valid

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findings regarding the program. Installation rates, electric water heater saturations and NTG estimates.

- In PY8, the team will conduct a limited evaluation focused mainly on determining program impacts.
 - The evaluation team will use the program-tracking database to estimate the PY8 *ex post* gross savings. We will review all data in the program-tracking database, apply TRM algorithms to estimate gross savings and apply deemed NTG ratios for net savings relying on electric water heater saturations from the PY7 participant survey.
- The PY9 evaluation will include a limited process evaluation and full impact assessment similar in scope to PY7.

3.5 Home Energy Reports

AIC's Behavioral Modification Home Energy Report (HER) Program began mid-year in PY3 with a pilot group of approximately 50,000 dual fuel customers. Since that time, the program has grown to reach almost one-third of AIC's 1 million residential customers as of PY6. Most of the approximately 224,000 participants are in their third year with the program, although about 26,000 residential customers participated for the first time in PY6.

Beginning in PY8, the HER Program will be offered through the IPA and not within the 8-103/8-104 portfolio. Our approach to the PY8 and PY9 program will build on prior evaluation findings and provide additional insights regarding program effects, as well as address key questions regarding the benefits of offering behavioral programs over time. The table below shows the proposed tasks and budgets for this effort over the PY8 and PY9 period.

Table 8. Planned Home Energy Report Evaluation Activities by Program Year

Activity ^a	PY7	PY8	PY9
Program Material Review	N/A – 8-103/8-104 Program	X	X
Program Manager and Implementer Interviews		X (n=2)	X (n=2)
Equivalency Analysis		X	X (if new cohort added)
Treatment and Control Group Survey		Rolling Internet surveys with treatment and control groups to identify select energy savings actions taken	
Net Analysis		Billing analysis for electric	Billing analysis for electric
Additional Net Analysis		Participation lift and channeling analysis	Application of adjusted net savings value from PY8
Budget		\$47,500	\$26,000

Residential Programs

^a Should a change in implementation occur whereby participants are dropped from the program, the team would also recommend conducting a persistence study.

Below we provide the rationale for the proposed evaluation activities.

■ Studies by Year

- For details of the PY7 evaluation, see the *AIC 8-103/8-14 Three Year Evaluation Plan*.
- In PY8, our analysis will focus on estimating net impacts through billing analysis with a channeling analysis.
 - We will conduct three brief Internet quantitative surveys with participants and the control group after HER reports are sent to the home allowing for, when coupled with PY7 results, a full year (including multiple seasons) of data. We will work with the program implementers to field the survey to coincide when reports are delivered to each cohort (depending upon fuel type and wave). To capture a full year of data we anticipate that these surveys will be conducted beginning in January, March and May 2016.
 - As in prior years, we will conduct a billing analysis of electric savings for the program to provide net impacts. In addition, we will conduct a participation lift and channeling analysis (incorporating historical trend analysis) to assess trends in program participation over time and to adjust net savings estimates to remove any double counting of savings across AIC programs. This analysis will also account for and remove channeling savings for current participants from prior program years (PY3-PY7). We anticipate conducting the modeling in August-September, followed by the channeling analysis in September-October, contingent upon receiving other program databases.
- In PY9, we will again conduct a billing analysis of electric savings for the program to provide net impacts. We will also apply adjustments developed in our PY8 channeling analysis to produce adjusted net savings estimates for the program year.

4. Non-Program Evaluation Activities

As part of the annual evaluation process, the team will perform a number of cross-cutting non-program activities. We describe these tasks in detail in the following subsections. Note that the budget associated with these tasks is split across the 8-103/8-104 and IPA programs.

4.1 Statewide Technical Reference Manual

4.1.1 Participation and Review

The team will continue its involvement in the Illinois Statewide Technical Reference Manual (TRM) process, including participation in Technical Advisory Committee (TAC) meetings and NTG Methodology Working Group meetings. For the former, this will include participation in weekly calls, as well as reviewing and commenting on TRM update items presented to the TAC. For the latter, this includes participation in bi-monthly, monthly and at times weekly calls with working group members, as well as drafting methodological protocols for inclusion in the TRM.

4.1.2 Research to Update the IL-TRM

Over the course of the next two program years, the evaluation team will conduct research to inform updates to the IL-TRM. The following table summarizes currently planned research activities associated with specific IL-TRM measures. The team has also reserved funds within each program year to support research into priority measures. We plan to review and determine which measures to study based on ongoing discussions with AIC and ICC staff, as well as through participation in the TAC.

Table 9. Planned TRM Research Activities

Program	Measure Description	Measure #	TRM Research Activity	Research Timing		
				PY7	PY8	PY9
Planned						
Lighting	CFLs	5.5.1	Logger Installation - Hours of Use		•	
	LEDs	5.5.6/5.5.8	Logger Installation - Hours of Use		•	
All Electric Homes	Faucet Aerators	5.4.4	Participant Survey - Installation Rates	•		
	Showerheads	5.4.5	Participant Survey - Installation Rates	•		
	CFLs	5.5.1	Participant Survey - Installation Rates	•		
	ASHP	5.3.1	Invoice Analysis of Incremental Cost	•		
			Metering	•		
	Ductless Mini-Splits	5.3.12	Invoice Analysis of Incremental Cost	•		
Metering			•			
Rural Efficiency Kits	Faucet Aerators	5.4.4	Participant Survey - Installation Rates	•		
	Showerheads	5.4.5	Participant Survey - Installation Rates	•		
	CFLs	5.5.1	Participant Survey - Installation Rates	•		
Potential						
Behavioral Modification	N/A		Persistence Study			•

4.2 Cost Effectiveness Analysis

As in prior program years, the evaluation team will work with AIC, as needed, to audit the company's cost-effectiveness analysis based on PY7 programs' results.⁵ As part of this process, we will first prepare the model inputs, which consist of evaluated program savings as determined through the PY7 evaluation effort. Next, we will review AIC's assumptions for avoided costs, discount rates, measure cost information, administrative costs, and other relevant data. Below we present a discussion of the Total Resource Cost (TRC) test used by AIC.

Total Resource Cost Test

To assess cost-effectiveness, the team will begin with a valuation of each program's net total resource benefits, as measured by: (1) the avoided electric costs, (2) the total incremental costs of measures installed, and (3) administrative costs associated with the program. A program is cost-effective if its net total resource benefits are positive:

$$\frac{\text{Total Resource Benefits}}{\text{Total Resource Costs}} \geq 1$$

where:

$$\text{Total Resource Benefits} = PV \left(\sum_{\text{year} = 1}^{\text{measure life}} \left(\sum_i^{i = 8760} (\text{impact}_i \times \text{avoided cost}_i) \right) \right)$$

and

$$\text{Total Resource Cost} = PV \left(\text{Incremental Measure Costs} + \text{Utility Costs} \right).$$

The benefits used in the TRC test calculation include the full value of time and seasonally differentiated generation, transmission, and distribution, as well as capacity costs. The TRC also accounts for avoided line losses and other quantifiable societal benefits, including avoided natural gas costs.

The calculation of avoided costs of power and energy that an electric utility would otherwise have had to acquire requires the inclusion of reasonable estimates of financial costs likely to be imposed by future regulations and legislation on emissions of greenhouse gases. For each energy efficiency measure included in a program, the team will adjust the hourly (8,760) system-avoided costs by the hourly load shape of the end use affected by the measure; this enables us to capture the full value of time and seasonally differentiated measure impacts.

For the cost component of the analysis, the team considered incremental measure costs and direct utility costs. Incremental measure costs are the incremental expenses associated with installing energy efficiency measures and, where applicable, ongoing operation and maintenance costs. These costs include incentives

⁵ Beginning in PY7, a third party will conduct this analysis for AIC.

Non-Program Evaluation Activities

as well as customer contributions (see Appendix A for a detailed definition). Utility costs include any customer payments and the expenses associated with program development, marketing, delivery, operation, and evaluation, monitoring, and verification.

Table 4-10 outlines our understanding of the allocation of savings as incentive payments by fuel type. We understand that, from a goal attainment perspective, the AIC programs’ savings by fuel type are driven by the type of customer account. From a cost-effectiveness perspective, however, AIC counts all measure savings regardless of the type of customer account. The team will assign saving credits according to the following table.

Table 4-10. Savings by Fuel Type

Type of Account with AIC	Electric Measures		Natural Gas Measures	
	Incentive Paid	Accrue Electric Savings	Incentive Paid	Accrue Therm Savings
Electric Only	Yes	Yes	No	For TRC only
Natural Gas Only	No	For TRC only	Yes	Yes
Both Electric and Natural Gas	Yes	Yes	No	Yes
	No	Yes	Yes	Yes

For purposes of the cost-effectiveness analysis, we will discuss with AIC the assignment of cost to the primary fuel targeted, ensuring that the primary fuel incentive is cost-effective for the primary fuel savings.

4.3 Residential Cross-Cutting Evaluation Efforts

The evaluation team will conduct two evaluation tasks each year that cut across all residential programs:

- A general population survey to 1) assess spillover effects from AIC’s ongoing marketing and education efforts in the nonparticipating population and 2) collect process-related data
- A market transformation/market effects analysis

Table 11 presents a summary of these tasks and their associated budgets. Note that the budget presented here will be split across the 8-103/8-104 and IPA budgets.

Table 11. Planned Cross-Cutting Evaluation Activities by Program Year

Activity	PY7	PY8	PY9
Non-Participant Survey	n=350	n=350	n=350
Market Transformation Analysis	Identify indicators/track historical and current data	Track indicators/quantify impacts	Track indicators/quantify impacts
Budget	\$86,000	\$84,000	\$85,000

Below we describe the rationale for our planned activities.

- **Proposed Studies:** Overall, PY7 will be the first year of the general population survey and the market transformation analysis. We will coordinate the nonparticipant survey design and spillover analysis with other evaluators and seek to include the protocol in the NTG TRM. We will establish the market transformation approach in PY7, gaining concurrence with other evaluators, and then apply it to PY8 and PY9, which will ensure some economies of scale, and therefore cost savings.

- **General Population Survey:** AIC is currently in its seventh year of program operation and conducts general marketing and education in addition to providing incentives. This marketing and education, over time, can itself create spillover. We are recommending a general population survey to quantify spillover and collect additional general information that may be beneficial (marketing preferences, existing saturations, etc.). Since spillover is usually very small in the general population, we will need a large sample of about 350 to ensure a high level of confidence and precision (e.g., 95% ± 5%). The team will draw the general population sample from AIC's residential customer database, using customer ID numbers to remove any who have participated in any of the energy efficiency programs (including behavioral modification and On Bill Financing). While we cannot exclude lighting program participants because of the transparent nature of the program, we will exclude lighting measures from spillover calculations as these have a high likelihood of being program bulbs. The general non-participant survey will contain modules with questions about all of AIC's residential energy efficiency programs. Residential respondents will be asked individual program module questions based on whether they have made the necessary program upgrade and why they did not participate in that program. We will use survey responses to identify motivators and barriers, preferred communications channels and existing level awareness, satisfaction with AIC, and likelihood to recommend an AIC program to a friend. We will explore whether any of this spillover has the potential to overlap with other measured spillover, and will minimize savings overlap across different data sources.

If AIC uses customer segments to target its marketing messages, the team will request that the residential database include tags for these segments. The team would then select a stratified random sample, which would provide results at the segment level to understand how these customer segments behave in the energy efficiency market. In addition, the survey responses will help identify residential market segments that are least likely to participate in AIC's energy efficiency programs and the barriers to participation for these market segments.

- **Market Transformation/Market Effects Analysis:** During the evaluation planning stages, the evaluation team will work with AIC to identify the most appropriate indicators of market transformation across and within each of the nine residential programs. We will select indicators that prior evaluations have tracked through survey questions consistently over the implementation years and identify which questions the evaluators should include in all program or non-participant surveys each year for the PY7–PY9 cycle.

The PY7 analysis will look back to earlier years to gather available data for indicators chosen. In PY8 and PY9, we will develop methods to analyze the data and quantify, where possible, the AIC's impact on market transformation and convert the data into quantified energy savings or market effects.

5. Budget Allocations by Year

Table 12 provides an overview of the current budget allocations, by year, ordered by planned spending in PY7. It is important to note that while the total evaluation budget for PY7 aligns with the EM&V contract, the PY8 and PY9 EM&V budget for the IPA has not yet been set. As a result, the team will revisit the plans and budgets outlined in this document once that information becomes available.

Table 12. Budget Allocations by Program Year

Budget Category	PY7	PY8	PY9
Program Level Budgets			
Small Business Direct Install	\$86,800	\$200,000	\$56,000
Multifamily	\$80,000	\$46,000	\$30,000
All Electric Homes	\$98,000	–	–
Lighting	\$32,500	\$325,000	\$40,000
Rural Efficiency Kit Distribution	\$38,000	\$15,000	\$30,000
Home Energy Reports	–	\$47,500	\$26,000
Total Program-Level Efforts	\$335,300	\$633,500	\$158,500
Non-Program Budgets			
Other Evaluation Activities	\$77,430	TBD	TBD
Evaluation Planning	\$26,100	TBD	TBD
Technical Reference Manual	\$60,000	TBD	TBD
Residential Cross-Cutting Activities	\$23,200	TBD	TBD
Total Non-Program Efforts	\$186,730	TBD	TBD
Contingency	\$72,315	TBD	TBD
TOTAL	\$572,045	TBD	TBD

A. Appendix - Incremental Cost Definition

Incremental Costs means the difference between the cost of the efficient Measure and the cost of the most relevant baseline measure that would have been installed (if any) in the absence of the efficiency Program. Installation costs (material and labor) and Operations and Maintenance (O&M) costs shall be included if there is a difference between the efficient Measure and the baseline measure. In cases where the efficient Measure has a significantly shorter or longer life than the relevant baseline measure (e.g., LEDs versus halogens), the avoided baseline replacement measure costs should be accounted for in the TRC analysis. The Customer's value of service lost, the Customer's value of their lost amenity, and the Customer's transaction costs shall be included in the TRC analysis where a reasonable estimate or proxy of such costs can be easily obtained (e.g., Program Administrator payment to a Customer to reduce load during a demand response event, Program Administrator payment to a Customer as an inducement to give up duplicative functioning equipment). This Incremental Cost input in the TRC analysis is not reduced by the amount of any Incentives (any Financial Incentives Paid to Customers or Incentives Paid to Third Parties by a Program Administrator that is intended to reduce the price of the efficient Measure to the Customer). Incremental Cost calculations will vary depending on the type of efficient Measure being implemented, as outlined in the examples provided below and as set forth in the IL-TRM.

Examples of Incremental Cost calculations include:

- The Incremental Cost for an efficient Measure that is installed in new construction or is being purchased at the time of natural installation, investment, or replacement is the additional cost incurred to purchase an efficient Measure over and above the cost of the baseline/standard (i.e., less efficient) measure (including any incremental installation, replacement, or O&M costs if there is a difference between the efficient Measure and baseline measure).
- For a retrofit Measure where the efficiency Program caused the Customer to update their existing equipment, facility, or processes (e.g., air sealing, insulation, tank wrap, controls), where the Customer would not have otherwise made a purchase, the appropriate baseline is zero expenditure, and the Incremental Cost is the full cost of the new retrofit Measure (including installation costs).
- For the early replacement of a functioning measure with a new efficient Measure, where the Customer would not have otherwise made a purchase for a number of years, the appropriate baseline is a dual baseline that begins as the existing measure and shifts to the new standard measure after the expected remaining useful life of the existing measure ends. Thus, the Incremental Cost is the full cost of the new efficient Measure (including installation costs) being purchased to replace a still-functioning measure less the present value of the assumed deferred replacement cost of replacing the existing measure with a new baseline measure at the end of the existing measure's life. This deferred credit may not be necessary when the lifetime of the measure is short, the costs are very low, or for other reasons (e.g., certain Direct Install Measures, Measures provided in Kits to Customers).
- For study-based services (e.g., facility energy audits, energy surveys, energy assessments, retro-commissioning) that are truly necessary for a Customer to implement efficient Measures, as opposed to being principally intended to be a form of marketing, the Incremental Cost is the full cost of the study-based service. Even if the study-based service is performed entirely by a Program Administrator's implementation contractor, the full cost of the study-based service charged by the implementation contractor is the Incremental Cost, because this is assumed to be the cost of the study-based service that would have been incurred by the Customer if the Customer were to have the study-based service performed in the absence of the efficiency Program. If the Customer implements efficient Measures

Appendix - Incremental Cost Definition

as a result of the study-based service provided by the efficiency Program, the Incremental Cost for those efficient Measures should also be classified as Incremental Costs in the TRC analysis.

- For the early retirement of duplicative functioning equipment before its expected life is over (e.g., appliance recycling Programs), the Incremental Costs are composed of the Customer's value placed on their lost amenity, any Customer transaction costs, and the pickup and recycling cost. The Incremental Costs include the actual cost of the pickup and recycling of the equipment (often paid for by a Program Administrator to an implementation contractor) because this is assumed to be the cost of recycling the equipment that would have been incurred by the Customer if the Customer were to recycle the equipment on their own in the absence of the efficiency Program. The payment a Program Administrator makes to the Customer serves as a proxy for the value the Customer places on their lost amenity and any Customer transaction costs.

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