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Ameren Illinois Company Multi-Year Evaluation Plan

2018-2021 Plan Period

Final

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Opinion Dynamics

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1. Introduction

This document presents the multi-year evaluation plan for Ameren Illinois Company's (AIC) 2018 Energy Efficiency Plan, which covers calendar years 2018-2021. Opinion Dynamics, along with its subcontractors Cadmus, Navigant, and Michaels Energy ("the evaluation team") has been contracted by AIC to provide independent evaluation of the 2018 Plan electric and gas energy efficiency programs. In this document, we provide a high-level overview of the evaluation activities planned for each year. On an annual basis, we will also provide detailed evaluation plans specific to each program year for AIC, Illinois Commerce Commission (ICC) staff, and Stakeholder Advisory Group (SAG) review. While the multi-year evaluation plan will serve as the foundation for these annual plans, AIC's programs and evaluation priorities may change from year to year.

The overall goal of annual evaluation efforts is to determine the electric, gas, and demand savings from AIC's energy efficiency program offerings, as well as what steps, if any, could be taken to optimize program performance from either an energy savings or customer satisfaction and engagement perspective. Findings from the evaluation process may be used by AIC and relevant stakeholders to demonstrate progress against savings targets, modify program design and operations, inform strategies to achieve deeper program savings, and ensure customer satisfaction and cost effectiveness.

The following sections describe the AIC energy efficiency portfolio to be evaluated, as well as key evaluation considerations guiding the evaluation team's approach and planned outcomes.

1.1 Legislative Mandates Informing Energy Efficiency Evaluation

AIC's 2018 Energy Efficiency Plan reflects the significant changes made to Illinois' energy efficiency landscape as a result of the Future Energy Jobs Act (FEJA) passed in 2016. This legislation introduced changes to utility electric savings targets, planning cycles and requirements, and to performance incentive mechanisms. At the same time, a number of these changes have important implications for evaluation of the utility's energy efficiency programs over the next cycle.

- **Cumulative Persisting Annual Savings (CPAS)**: Beginning in 2018, electric savings goals for the utilities are defined based on cumulative persisting annual savings as a percentage of sales. As such, annual evaluations of AIC's programs will track CPAS for 2018 and beyond.

- **Non-Electric Fuel Savings Can be Counted Towards Electric Goals**: The utilities may count gas or other fuel savings towards their electric savings goals if (1) a joint electric and gas program runs out of gas funds but electric budget remains available, and (2) if programs save both electricity and gas but there is not a distinct gas program offered. The evaluation team will work with AIC to calculate this conversion.

- **Utility Responsibility for All Energy Efficiency**: With passage of the FEJA, the delivery of energy efficiency programs is consolidated under the utilities, which mean that the Illinois Power Agency (IPA) and the Department of Commerce and Economic Opportunity (DCEO) no longer serve as funding and delivery channels for utility customers. From an evaluation perspective, this means that the evaluation team will be assessing savings from a wider range of customers (e.g., public sector customers formerly served by the DCEO).

- **Leveraging Advanced Metering Infrastructure (AMI) in Planning, Implementation and Evaluation:** While AIC's rollout of AMI is not yet complete, the evaluation team will look for opportunities, where feasible,

to use this data in assessing program performance. Likely candidates include programs evaluated using consumption analysis.

- **Use of Randomized Controlled Trials (RCT) or Quasi-Experimental Design in Evaluation:** Per order of the ICC, Opinion Dynamics has carefully considered the use of RCT or quasi-experimental design in its evaluation plans. For most energy efficiency measures planned by AIC for 2018-2021, the SAG has developed best practices (in form of the IL-TRM) that prescribe savings estimates for measures. In cases where these best practices do not currently exist, we have examined the possibility to use RCT or quasi-experimental design. In the case of the Behavioral Modification Initiative and TRM research focused around smart thermostats, we will proceed with this evaluation methodology. In the remaining cases where savings are not prescribed (the Custom and Retro-Commissioning Initiatives within the Business Program), small program populations and variable participants do not support the use of these methods for evaluation.

As noted throughout this and the evaluation team's 2018 Annual Evaluation Plan, we are actively engaging with AIC, ICC staff, and the SAG (including its Economically Disadvantaged Advisory Group)on these issues, as well as collaborating with other evaluation teams in the state to ensure the evaluation of the 2018 Plan achieves these key objectives.

1.2 AIC's Energy Efficiency Portfolio

AIC's energy efficiency portfolio for the 2018 Plan is made up of two programs, the Residential Program and the Business Program; each program consists of multiple initiatives that target specific market segments and/or equipment types. Both programs generate electric and gas savings for AIC's customers and while some initiatives are consistent with past AIC energy efficiency offerings (e.g., Business Custom and Residential Behavioral Modification), other initiatives are new (e.g., Business Streetlighting and Residential Public Housing).

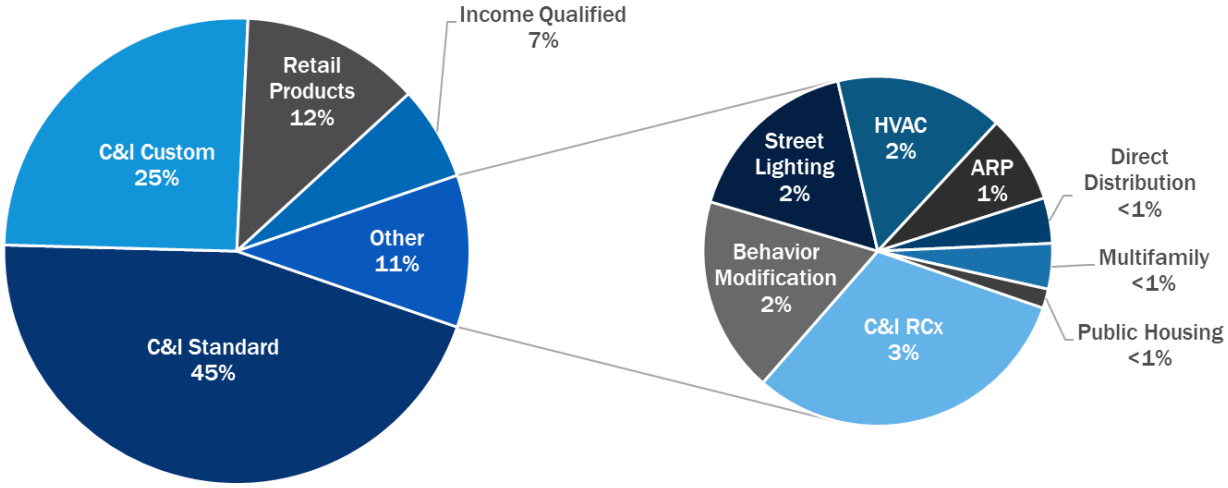
Table 1. AIC 2018-2021 Energy Efficiency Program and Initiatives

Residential Program Initiatives	Business Program Initiatives
■ Retail Products	■ Standard
■ Income Qualified	■ Custom
■ Behavioral Modification	■ Retro-Commissioning
■ HVAC	■ Streetlighting
■ Appliance Recycling	
■ Multifamily	
■ Public Housing	
■ Direct Distribution of Efficient Products	

Figure 1 shows the various program initiatives and their contribution to annual electric incremental savings targets. As illustrated, the Business Program's Custom and Standard Initiatives, as well as the Residential Program's Income Qualified and Retail Products Initiatives are significant contributors to annual savings. The role of the Business Program is particularly important to highlight here given the fact that beginning in 2018, AIC's largest commercial customers (i.e., 10 MW customers), who previously participated at high rates, will no longer be permitted to participate in the utility's energy efficiency programs. As a result, AIC and its

implementation contractors will need to reach significantly more small and medium customers to achieve their ICC approved electric savings goals.

Figure 1. AIC Portfolio 2018-2021 Electric Savings Summary based on Annual Incremental Electric Savings

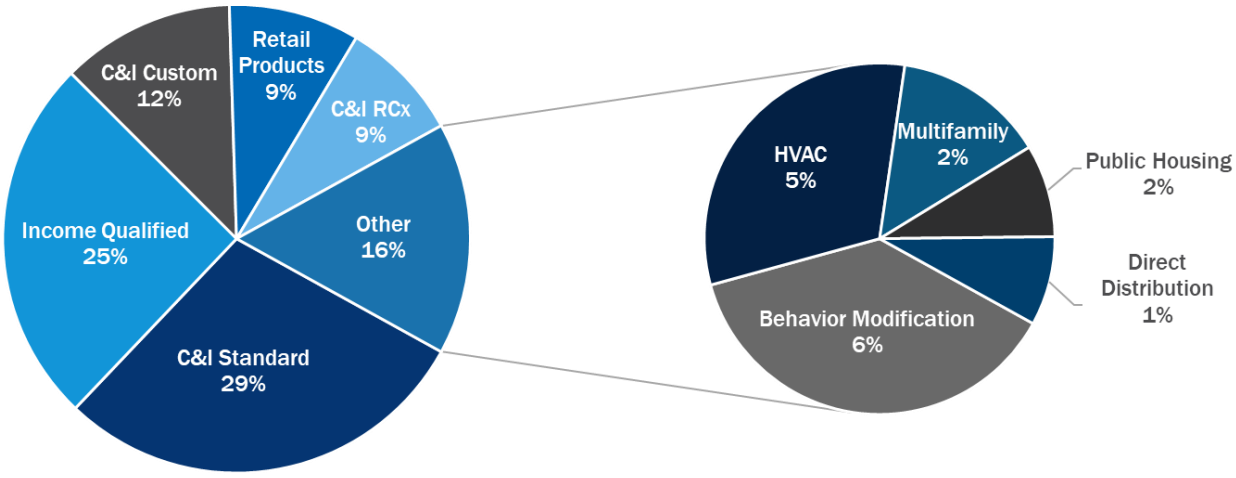


Source: AIC 2018-2021 Plan Compliance Filing

Additionally, as discussed in Section 1.1, the utility's electric savings goals are now based on cumulative persisting annual savings (CPAS), making programs and initiatives that offer equipment with longer lifetimes increasingly important long-term. This is due to the fact that AIC will be required to replace any savings attained by their programs that "expire" (e.g., program-incented measures reach the end of their life). However, only a small portion of AIC's portfolio savings will expire during this plan period, which means that Figure 2 closely represents initiative contributions to 2021 CPAS goals. In contrast, AIC will be required to replace a significant share of savings achieved during 2018-2021 in future plan periods.

Figure 2 provides an overview of the portfolio's gas savings for the 2018 Plan period. As with the electric portfolio, the Business Program and the Residential Program's Income Qualified and Retail Products Initiatives are key contributors.

Figure 2. AIC Portfolio 2018-2021 Gas Savings Summary



Source: AIC 2018-2021 Plan Compliance Filing

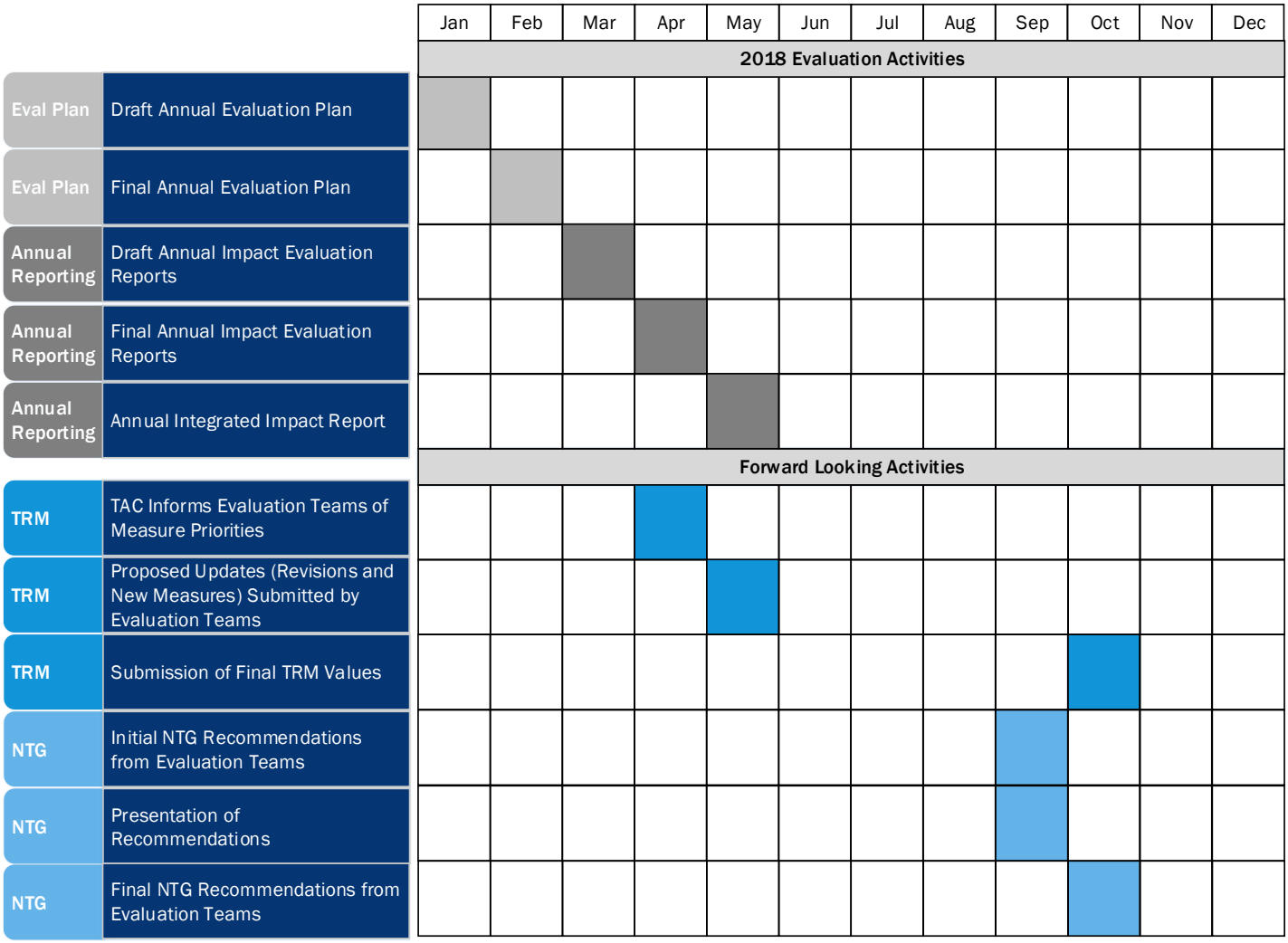
2. Evaluation Policies and Definitions

In preparing this plan, the evaluation team reviewed the most recent Illinois Energy Efficiency Policy Manual (Version 1.1), ICC Order 17-0311 approving AIC's Energy Efficiency and Demand-Response Plan (2018 Plan), and the requirements of the FEJA related to evaluation. Within this section, we outline key requirements around when evaluation-based information should become available. We also provide a set of key terms and definitions used within this document so that stakeholders have a clear understanding of what is planned.

Evaluation Requirements

Figure 3 outlines the dates at which the evaluation team must provide inputs to and outputs from its evaluation efforts. These include evaluation plans and reports, and research and evaluator recommendations related to net-to-gross (NTG) ratios, and the Illinois Statewide Technical Reference Manual (IL-TRM).

Figure 3. Annual Evaluation Milestones



Beyond the stipulated timelines presented in Figure 3, it is important to note that the NTG policies included in the Illinois Energy Efficiency Policy Manual state that:

- Free-ridership must be assessed for each program when conducting NTG research;
- Spillover should be included whenever feasible, and the use of secondary sources should be considered if primary research is not possible; and
- Portfolio-level spillover analysis should be considered at least once during a Plan period if feasible.

Evaluation Terms and Definitions

Within this section, we outline and define the key terms used throughout this plan and in reporting on AIC's energy efficiency achievements. The first set of terms, presented in Table 2, relates to gross and net energy (MWh and therm) and demand (MW) savings.[1]

Table 2. Savings-Related Terminology and Definitions

Savings Terminology	Definition
Ex Ante Gross Savings	Gross savings present in the final program-tracking database provided by AIC
Ex Ante Net Savings	Net savings present in the final program-tracking database provided by AIC
Verified Ex Post Gross Savings	Gross savings calculated by the evaluation team
Verified Ex Post Net Savings	Net savings calculated by the evaluation team based on IL-SAG approved NTGRs (or approved research based values applied retrospectively)

Within Table 3, the evaluation team also defines each of the impact evaluation activities outlined within the evaluation plan. Note that we have differentiated between activities applicable to prescriptive and custom measures, respectively, and use this terminology consistently throughout the evaluation plan.

[1] Gross savings are the change in energy consumption and/or demand that results directly from program-related actions taken by participants in an efficiency program, regardless of why they participated. Net savings are the change in energy consumption and/or demand that is attributable to a particular energy-efficiency program (SEE Action Energy Efficiency Program Impact Evaluation Guide).

Table 3. Impact Evaluation Activity Definitions

Prescriptive Measures	Custom Measures
Definition: Measures with predetermined savings values or IL-TRM algorithms for use in determining savings Example: A-Line LED bulb	Definition: Unique or complex measures for which there is not an IL-TRM algorithm Example: Compressed air system resequencing
Impact Evaluation Activity Definitions	
■ **Database Review**: This activity involves reviewing the program or initiative-tracking data to check that incentivized measures meet all program requirements. ■ **Engineering Desk Review:** This activity involves reviewing supporting project documentation, as well as initiative-tracking data to ensure that original data was entered correctly from invoices/documentation. ■ **IL-TRM Application Review**: This activity involves reviewing initiative-tracking data to see that the correct deemed input values and IL-TRM specified algorithms are used in calculating savings. ■ **On-Site Verification**: This activity involves on-site visits, typically with a sample of projects, to verify that incentivized measures are installed and operational.	■ **Database Review**: This activity involves reviewing the program or initiative-tracking data to check that incentivized measures meet all program requirements. ■ **Engineering Desk Review**: This activity involves reviewing project documentation and calculations, and making any associated revisions to account for analytical errors, incorrect assumptions, etc. ■ **On-Site Measurement & Verification**: This activity involves conducting site specific measurement and verification (M&V) (for example, metering equipment runtime), typically with a sample of projects, to estimate site-specific savings. ■ **Consumption Analysis**: This analysis involves the use of regression models with historic customer energy usage information to calculate annual energy savings ■ **Modeling**: The use of building simulation models to estimate building-level energy savings

3. Residential Program Evaluation Efforts

In this section, we outline the anticipated evaluation activities for each of the Residential Program Initiatives. The research proposed for the Residential Program Initiatives focuses on gathering data on the effectiveness of new strategies for serving AIC's economically disadvantaged customers through the Income Qualified Initiative, as well as gaining new insights related to the energy savings potential of new measures such as smart thermostats offered through the Retail Products Initiative. Across all Initiatives, the evaluation team will look for opportunities to leverage AMI data, as well as to assess parameters associated with measure effective useful lives.

3.1 Retail Products Initiative

The objective of the Residential Retail Products Initiative is to increase awareness and sales of high efficiency products through retail and online stores. The program provides instant discounts at point-of-purchase and/or mail-in cash rebates to reduce the cost of high efficiency lighting products, home appliances, and programmable and smart thermostats. The implementation contractor will work with participating retailers to promote qualifying products through in-store marketing, special product placement, and product demonstrations. Implementation staff will also visit participating retailers to provide sales associates with training on how to best promote the program with customers.

Table 4 shows the proposed tasks for this effort over the next 4-year period.

Table 4. Retail Products Initiative Evaluation Activities – Four Year Plan

Timing	Activity	2018	2019	2020	2021
Annual	Initiative Material & Database Review	✓	✓	✓	✓
	Initiative Staff Interviews	✓	✓	✓	✓
	Gross Impact Analysis - Database Review	✓	✓	✓	✓
	Gross Impact Analysis - IL-TRM Application Review	✓	✓	✓	✓
	Net Impact Analysis - SAG Approved NTGR	✓	✓	✓	✓
Phased	Process Model Development	✓			
	Lighting Intercepts & Shelf Stocking Study	✓		TBD	
	Non-Lighting Participant Survey (Process & NTG)	Continuous, Real Time			
	Smart Thermostat Process Research	✓		✓	

We proposed the evaluation activities included in Table 4 for the following reasons:

- 2018: Given that the Retail Products Initiative is being offered for the first time in a number of years, it is important to assess both initiative impacts and processes in the first year of evaluation. These activities will include research with customers purchasing efficient lighting and non-lighting products.
  - Using information that we gain from initiative staff interviews and materials review, we will develop a process model for the Initiative. With so many new measures and implementation processes, the model will identify critical initiative processes for evaluation, as well as indicators for initiative progress in addition to energy savings, such as customer awareness of initiative discounts. The model will document initiative goals, the barriers to achieving them, and the activities that the

program implementer is using to overcome them. We will construct separate models for measures that have distinct program theories, such as those that are delivered through different channels.

- For efficient lighting, we plan to conduct in-store intercepts to assess NTG. We will use the interview results to estimate initiative net-to-gross ratios (NTGRs) by bulb type, leakage, and the percentages of products purchased by commercial customers. Interview results will also provide an estimate of market share for inefficient versus efficient lighting products.
- For non-lighting products, the evaluation team will conduct rolling surveys with customers who have purchased discounted products. We will use these surveys to estimate NTGRs and installation rates for each measure. We will also measure participant satisfaction with the program measures and processes, as well as how customers are using the discounted products. We will work with program staff to determine the best fielding method based on the availability of customer contact information. Ideally, we will conduct surveys every quarter with recent participants to minimize the time between program participation and survey date.

- 2019: During our second year of evaluation, the team will focus exclusively on impact evaluation and documenting any changes to or challenges associated with implementation.
- 2020 and 2021: The last two years of evaluation will include an emphasis on process evaluation (2020), as well as impact evaluation and NTG assessment (2020 and 2021). The process evaluation and NTG work is important given the shifts expected in measures incentivized through the program (e.g., a decline in lighting products and ramp up of other products), and the impact evaluation work ensures AIC meets annual reporting requirements.

3.2 Income Qualified Initiative

The Income Qualified Initiative is a home energy diagnostic and whole-house retrofit program. The target market for the Initiative is low- to moderate-income AIC customers with a household income up to 300% of federal poverty guidelines for household size. Although continuing from AIC's Plan 3 portfolio, there are several important program design and implementation changes planned for the Initiative during the 2018 Plan:

- Community Action Agencies (CAAs) and/or the Illinois Home Weatherization Assistance Program will provide recruitment and implementation services for the Initiative in addition to an AIC selected implementation contractor;
- Income qualified multifamily properties will be eligible to participate;
- The Initiative will provide no-cost energy savings kits at special events, as well as through other direct distribution efforts; and
- Customers in select communities will receive enhanced rebates for HVAC and lighting equipment, marketed in conjunction with the HVAC and Retail Products Initiatives.

Given these program changes, the evaluation team has proposed robust impact and process evaluation efforts across the four-year plan period as shown in Table 5.

Table 5. Income Qualified Initiative Evaluation Activities – Four Year Plan

	Activity	2018	2019	2020	2021
Annual	Initiative Material & Database Review	✓	✓	✓	✓
	Initiative Staff Interviews	✓	✓	✓	✓
	Gross Impact Analysis – Database Review	✓	✓	✓	✓
	Gross Impact Analysis - Engineering Desk Review	✓	✓	✓	✓
	Gross Impact Analysis - IL-TRM Application Review	✓	✓	✓	✓
	Net Impact Analysis – SAG Approved NTGR	✓	✓	✓	✓
Phased	Process Model Development	✓			
	Community Agency Interviews	✓	✓		✓
	Multifamily Manager/Owner Interviews	✓		✓	
	On-Site Verification	✓		✓	
	Energy Savings Kit Recipient Survey (Process & ISR)	✓			
	Participant Survey (Process)	✓		✓	

We proposed the evaluation activities included in Table 5 for the following reasons:

- **2018**: Because of changes in program design, the evaluation team has prioritized extensive process and impact evaluation activities for 2018.
  - We will conduct interviews with CAA representatives to understand their roles and responsibilities in the program, their internal processes, and challenges to implementation.
  - Concurrently, we will conduct surveys with participating single-family and multifamily customers to understand their experience with the program and recommendations for improvement. Where possible, we will set quotas based on the program delivery channel (e.g., AIC's implementation contractor vs. CAAs) to assess whether significant differences exist in the customer experience. In addition, as feasible, we will use our surveys (with both tenants and owners/managers_ to gather data to support the estimation of non-energy benefits (NEBs).
  - On-Site Visits will also be prioritized for 2018 given the new involvement of the CAAs in implementing the program. The visits will be designed to verify measure installation, as well as assess the quality of installation and depth of savings in participating homes. We will finalize the sample approach for these visits upon review of interim program tracking data.
- **2019**: During the second year of the plan period, in addition to impact analysis activities, we will focus on gathering ongoing feedback from CAAs and other entities offering income qualified implementation services as they gain additional experience implementing the program in AIC territory.
- **2020 and 2021**: The evaluation activities planned for the later years of the plan period mirror those conducted earlier, with 2020 serving as another heavy impact and process evaluation year while 2021 focuses largely on program impacts.

3.3 Public Housing Initiative

The Public Housing Initiative is designed to mirror the Income Qualified Initiative by providing home energy diagnostics and whole-house retrofits. The target market for the Initiative is single-family and multifamily public-sector housing owned by government entities (including federal, state, and municipal housing authorities) in communities with average household income at or below 300% of Federal Poverty Guidelines. The Initiative will collaborate with federal, state, and municipal government agencies within the AIC service territory and housing authorities to identify and weatherize eligible properties.

Table 6 shows the proposed tasks for this effort over the next 4-year period.

Table 6. Public Housing Initiative Evaluation Activities – Four Year Plan

Timing	Activity	2018	2019	2020	2021
Annual	Initiative Material & Database Review	✓	✓	✓	✓
	Initiative Staff Interviews	✓	✓	✓	✓
	Engineering Desk Review	✓	✓	✓	✓
	IL-TRM Application Review	✓	✓	✓	✓
	Net Impact Analysis – SAG Approved NTGR	✓	✓	✓	✓
Phased	Process Model Development	✓			
	On-Site Verification		✓		✓
	In-Depth Housing Authority Interviews	✓		✓	
	Historical Participation Analysis				✓

We proposed the evaluation activities included in Table 6 for the following reasons:

- **2018**: Impact evaluation efforts will be augmented with targeted process evaluation during the first year of the Public Housing Initiative. As a market not previously served by AIC energy efficiency programs, documenting the Initiative's design and implementation will provide a process map for evaluation, while exploring the experiences of new participants and their barriers to participation, will provide insight into program performance.
- **2019**: During the Initiative's second year of operation, the evaluation team will conduct on-site verification visits to ensure that energy efficiency equipment and upgrades are installed and operating. These visits will also afford the team an opportunity to assess the quality of installation and depth of savings achieved at participating buildings.
- **2020 and 2021**: The evaluation activities planned for the later years of the plan period mirror those conducted earlier, with 2020 serving as a joint impact and process evaluation year while 2021 focuses on program impacts and a historical participation analysis to identify gaps in Initiative coverage and therefore savings opportunities for future years.

3.4 Behavioral Modification Initiative

AIC has offered the Behavioral Modification Initiative since 2010 to help reduce residential customers' energy consumption. In particular, the program seeks to (1) reduce energy consumption by encouraging energy-efficient behaviors, (2) boost customer engagement and education by helping customers understand energy

efficiency and how to save energy in their homes, and (3) educate customers about no-cost and low-cost energy-saving measures and behaviors.

Traditionally, the Initiative has offered three forms of treatment: a hard-copy printed home energy report (HER) mailed four times a year to customer billing addresses; an electronic HER (eHER) sent once per billing cycle to all customers with email addresses; and an online portal, which customers can log onto to view the report and access additional information. While we anticipate that the Initiative will be implemented in a consistent manner in 2018, AIC has selected a new program implementer and as such, the evaluation team will verify program design details with them as a first step in the 2018 evaluation.

Finally, it is important to note that the contribution of the Behavioral Modification Initiative declines significantly in the 2018 Plan period compared to prior AIC Plan periods. As a result, the evaluation team has focused almost exclusively on determining program impacts as opposed to conducting process evaluation research as shown in Table 7.

Table 7. Behavioral Modification Initiative Evaluation Activities – Four Year Plan

Timing	Activity	2018	2019	2020	2021
Annual	Initiative Material & Database Review	✓	✓	✓	✓
	Initiative Staff Interviews	✓	✓	✓	✓
	Equivalency Analysis	✓	✓	✓	✓
	Consumption Analysis	✓	✓	✓	✓
	Channeling Analysis	✓	✓	✓	✓
Phased	Evaluability Assessment	✓			
	Persistence Study	✓		✓	
	Internet Survey	✓	✓	✓	✓
	Statewide Methods Coordination	✓			

As noted above, in addition to answering core impact related research questions, the evaluation team will conduct a persistence study to understand whether and how savings degrade in the absence of a program intervention, as well as to provide more accurate lifetime savings estimates. We will answer the following research questions through our persistence study efforts:

- What is the difference in program savings between customers experiencing a *stoppage* in treatment compared to those who continue to receive regular treatment?
- What is the difference in program savings for *dual-fuel or gas-only* customers receiving a reduction or stoppage in treatment compared to those who continue to receive regular treatment?
- What is the difference in program savings between *customers who have received the report for longer (e.g., duration)* than customers who have received the report for a shorter duration (i.e., are there differences across cohorts)?

The evaluation team will refine the persistence study research approach based on discussions with AIC and their implementation contractor regarding the planned stoppage in treatment. In general, the evaluation team will conduct consumption analyses to determine energy savings since the treatment was stopped, as well as any decay in savings. The consumption analysis will be conducted at the program and cohort level in order to

understand the total impacts of the cessation of program treatment. Findings from the persistence study will be used to inform updates to the IL-TRM.

The evaluation team will also gather data through an internet survey with customers in the treatment and control groups, which we plan to implement on a rolling basis. For 2018, responses to the survey will provide early feedback to AIC about how the transition to a new program implementer has gone. As the initiative continues, we will monitor satisfaction with the HERs (print, electronic, and web portal formats), changes in customer behavior in response to tips provided in the HERs, customer awareness of other AIC initiatives that are mentioned in HERs, and what improvements could be made to the initiative from the customer perspective.

Finally, in summer 2018, we plan to collaborate with the other Illinois evaluation teams to codify methodology around the following items pertaining to behavioral programs:

- Approach to assessing equivalency of treatment and control group customers
- Approach to calculating demand savings
- Approach to calculating program uplift and joint savings, including both annual and legacy, for energy and demand savings
- Approach to applying joint savings to estimated energy and demand savings

Much of this research is codified in existing behavioral protocols, but there are items specific to the Illinois landscape (e.g., legacy uplift), or to existing data (e.g., approach to demand impacts) that require a coordinated, transparent approach. If we agree it is appropriate, we will recommend that this methodology be incorporated into the IL-TRM or other policy documentation.

3.5 HVAC Initiative

Through the HVAC Initiative, AIC offers incentives for the purchase of high-efficiency heating and cooling equipment, heat pump water heaters and smart thermostats to both single- and multifamily homes. AIC implementation staff will work directly with manufacturers, wholesalers and trade allies/installers to educate them about the incentives available, as well as to train them on promoting the program to AIC customers. Consistent with past HVAC offerings, it is likely that the Initiative will require registered program allies to install some equipment incentivized by AIC. The overall goal of this Initiative is to persuade customers to purchase higher-efficiency equipment than they might otherwise purchase.

Measures offered through this Initiative include: programmable and smart thermostats, air source heat pumps, central air conditioners, ECM motor blower retrofits in existing furnaces, new furnaces with an ECM blower motor, and heat pump water heaters.

Table 8. HVAC Initiative Evaluation Activities – Four Year Plan

Timing	Activity	2018	2019	2020	2021
Annual	Initiative Material & Database Review	✓	✓	✓	✓
	Initiative Staff Interviews	✓	✓	✓	✓
	Engineering Desk Review	✓	✓	✓	✓
	IL-TRM Application Review	✓	✓	✓	✓
	Net Impact Analysis – SAG Approved NTGR	✓	✓	✓	✓

Timing	Activity	2018	2019	2020	2021
Phased	Trade Ally Interviews		✓		✓
	Participant Survey (Process & NTG)		✓		✓
	AMI Disaggregation and Savings Analysis			✓	

We proposed the evaluation activities included in Table 8 for the following reasons:

- **2018:** Given the extensive research recently conducted for AIC's HVAC offerings, the focus of 2018 evaluation efforts is on estimating Initiative impacts. As part of this process, we will conduct both an Engineering Desk review of supporting project documentation, and an IL-TRM Application Review to ensure that savings for the Initiative is accurately estimated.

- **2019:** Beyond Initiative impacts, our evaluation efforts in 2019 will focus on obtaining an updated NTGRs and process findings. For the process and NTG assessment, we will conduct surveys with trade allies and participating customers.

  - The interviews with active registered (AR) and non-active registered (NAR) contractors will be used to obtain feedback about program requirements, processes and design. The evaluation team will use the NAR surveys to both identify possible nonparticipant spillover from the program's influence on the overall demand for energy efficient equipment, and help explain why contractors are registered, but do not participate.

  - Surveys with participating customers will explore key aspects of the participation process, as well the key drivers of purchase decisions and the role of the Initiative in that decision. For AIC customers installing ECM measures, the evaluation team will also use the survey to understand customers' current fan operating practices across various seasons (summer, fall, winter, spring) and how those fan operating practices compare to their pre-ECM behaviors.

- **2020 and 2021**: In 2020, we plan to conduct an interval metering analysis, disaggregating loads into HVAC and other end-uses and analyzing the data in comparison to a matched control group to estimate savings from HVAC participation. This task is dependent on the availability of AMI data for a sample of participants and a larger group of nonparticipants to develop a matched control group. It is also included in Section 5.1.2 of this plan. Then in 2021, the evaluation team will focus on both impact and process evaluation similar to that outlined in 2019.

3.6 Appliance Recycling Initiative

The Appliance Recycling Initiative promotes the retirement and recycling of working, but inefficient refrigerators and freezers from the homes of AIC's electric customers by offering a turn-in incentive and free pickup, as well as information and education on the cost of keeping an inefficient unit in operation. This Initiative will be cross-promoted with the Retail Products Initiative, so that customers purchasing new energy efficiency refrigerators and freezers know how to dispose of their older equipment, as well as through the Income Qualified Initiative, where in-home assessments are done to help identify potential energy efficient upgrades.

Table 9. Appliance Recycling Initiative Evaluation Activities – Four Year Plan

Timing	Activity	2018	2019	2020	2021
Annual	Initiative Material & Database Review	✓	✓	✓	✓
	Initiative Staff Interviews	✓	✓	✓	✓
	Engineering Desk Review	✓	✓	✓	✓
	IL-TRM Application Review	✓	✓	✓	✓
	Net Impact Analysis – SAG Approved NTGR	✓	✓	✓	✓
Phased	Retailer Interviews	✓		✓	
	Participant Survey (Process & NTG)	✓		✓	

Across each year, we will base gross impacts on program tracking data and the IL-TRM. As part of this process, we will review the program tracking database to verify participation, as well as to review the application of deemed savings inputs specified in the IL-TRM. We will also conduct research with participating AIC customers, as well as retailers, over the course of the four-year plan period to accomplish the following:

- In **2018 and 2020**, we will gather data to update the Initiative's NTGR. The survey will be administered by telephone, and the NTG algorithm will be developed based on the IL NTG Protocols. Final sample sizes will be determined based on program participation.
  - Through the participant survey, the evaluation team will also ask questions to understand the extent which ARP is inducing customers to reduce the number of refrigerators in their home. By exploring how many refrigerators a customer had prior to Initiative participation and how many they have at the time of the interview, the research will provide updated insight into the appliance replacement scenario.
- In **2019 and 2021**, we will conduct research with retailers to explore actions taken with regard to recycled units, particularly the proportion of units picked up by retailers that get resold, recycled, or disposed. These estimates inform the NTG estimate as the proportion of customers indicating they would have recycled through retailers, absent the program, will be adjusted by whether retailers would resell, dispose, or recycle the unit.

3.7 Multifamily Initiative

The Multifamily Initiative offers incentives and services that enable energy savings and lower operating costs in market-rate multifamily housing (buildings with four or more units and managed by a private entity). To serve multiple properties through one point of contact, the Initiative's target audience includes property management companies with multiple properties, but the program will also reach out to individual property owners as necessary. AIC's implementation contractor will conduct all outreach and recruitment, perform audits to identify installation opportunities, and provide direct installation of energy-saving measures for building common areas and tenant units. Measures are provided free-of-charge. The provided measures are as follows:

- **In-Unit:** Program offerings for tenant units include LEDs, low-flow showerheads, faucet aerators, programmable thermostats, pipe wrap, and Tier 2 smart power strips.

- **Common Areas:** Common area offerings include light bulb replacements. The implementer offers properties medium screw-based standard and specialty LED upgrades to replace incandescent or halogen lamps in interior and exterior settings.

AIC will also use the Multifamily Initiative to cross-promote other energy-saving opportunities as appropriate, including the Appliance Recycling, HVAC, and Business Program Initiatives.

Table 10. Multifamily Initiative Evaluation Activities – Four Year Plan

Timing	Activity	2018	2019	2020	2021
Annual	Initiative Material & Database Review	✓	✓	✓	✓
	Initiative Staff Interviews	✓	✓	✓	✓
	Engineering Desk Review	✓	✓	✓	✓
	IL-TRM Application Review	✓	✓	✓	✓
	Net Impact Analysis – SAG Approved NTGR	✓	✓	✓	✓
Phased	On-Site Measurement and Verification		✓		
	Participating Property Manager/Owner Survey (Process & NTG)	✓		✓	
	Participating Tenant Survey (Process & NTG)	✓		✓	

- **2018:** We will focus on gathering process and NTG information from participating property managers and owners, as well as tenants. This is particularly important in the first year of the Initiative given the program's new focus on property management companies with multiple properties in AIC service territory.
  - The evaluation team will use interviews with property managers and owners to collect data needed to establish (pipe wrap) and update (in-unit LEDs, common area LEDs, showerheads, faucet aerators, programmable thermostats) NTGRs for the Initiative. Surveys will also explore property manager experiences with the Initiative and will assess their awareness of and interest in the energy-saving programs that AIC cross-promotes.
  - We will use a mail-push-to-web survey with tenants living in units that received direct install measures to evaluate satisfaction with all measures received, establish a NTGR for Tier 2 smart power strips, and gather updated information on the awareness and purchase of LEDs, which the program began offering in the PY9 Transition Period. We will use tenant responses to contextualize the NTGR for LEDs as determined through property manager survey.
- **2019:** The evaluation team will focus on Initiative impacts during the second year of evaluation. In addition to the annual Engineering Desk Reviews and IL-TRM Application Review, we will conduct onsite verification visits to ensure that IL-TRM assumptions are still appropriate. We will design our sampling approach based on Initiative participation and target 90% relative precision at 10% confidence around results by measure type.
- **2020 and 2021:** We will leverage the 2020 surveys to support cross-cutting research on NEBs to inform program marketing/outreach and demonstrate additional values of the program. We will then focus exclusively on program impacts in 2021 with additional onsite M&V as needed.

3.8 Direct Distribution of Efficient Products Initiative

The Direct Distribution of Efficient Products Initiative provides energy savings kits to students in participating 5th to 8th grade classrooms with a focus on low income communities that receive both electric and gas service from AIC. The kits contain LED light bulbs, an LED nightlight, low flow showerheads and faucet aerators, a Tier 1 smart power strip, and a furnace filter tone alarm. By providing the kits in conjunction with energy conservation education in the classroom, AIC hopes to reduce energy use in participating student homes. To achieve its goals related to this Initiative, AIC will partner with the Illinois Board of Education, parent and teacher organizations, and public and private school systems.

Table 11. Direct Distribution of Efficient Products Initiative Evaluation Activities – Four Year Plan

Timing	Activity	2018	2019	2020	2021
Annual	Initiative Material & Database Review	✓	✓	✓	✓
	Initiative Staff Interviews	✓	✓	✓	✓
	IL-TRM Application Review	✓	✓	✓	✓
	Net Impact Analysis – SAG Approved NTGR	✓	✓	✓	✓
Phased	Parent Survey (Process & NTG)		✓		✓

We proposed the evaluation activities included in Table 11 for the following reasons:

- **2018**: Given that AIC offered a similar initiative for the past 2 program years and conducted research with parents in 2017, the evaluation team will focus on documenting program design and implementation, as well as estimating program impacts. The impact analysis for the program will leverage the IL-TRM and SAG-approved NTGRs.
- **2019**: In the second year of the Initiative' operation, the evaluation team will revisit questions around program process, measure installation, and NTG last researched in 2017. The evaluation team will continue to work closely with the implementation team to design and administer surveys to the parents of participating students on a rolling-basis using a web-based survey.
  - The parent survey will explore what types of equipment the kit measures replaced, as well as their knowledge of the energy efficient products provided through the kit. The evaluation team will use this information to inform an analysis of program attribution.
- **2020 and 2021**: During the last two years of the 2018 Plan period, the evaluation team will alternate between a focus on Initiative energy savings impacts (2020) and deeper dives into the participation process (2021). If changes are made to the Initiative in these years, the evaluation team may change the order in which this research is conducted. However, if implemented as planned, there will be a one year gap between detailed process evaluation activities.

3.9 Cross-Cutting Residential Program Research

AIC is entering its tenth year of program operation, and conducts general marketing and education around energy efficiency in addition to offering discrete energy efficiency programs. Over time, these marketing and education efforts can result in energy savings outside of programs that could count as spillover. While spillover among program participants is captured in individual program evaluation efforts, non-participant spillover is not captured. As a result, the evaluation team will conduct ongoing general population surveys to quantify non-

participant spillover and collect additional information that may be beneficial to program implementation (e.g., program awareness, and consumer preferences and perceptions).

As non-participant spillover is likely typically rare, estimating non-spillover requires a sample of at least 350 respondents to ensure acceptable precision at a desired confidence level. To conduct this research, the evaluation team will draw a random sample from AIC's residential customer database, using customer identification numbers to remove those participating in any AIC energy efficiency programs (including the Behavioral Modification Program). While we cannot exclude customers who receive discounted lighting through the Retail Products Initiative, we will exclude lighting measures from our 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 initiatives. 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.

Additionally, to gain information about the existing market for the products discounted through the Retail Products Initiative, we will include an additional battery of questions on this survey in 2018. Specifically, we will ask about customer awareness program discounts and methods for participating (i.e., instant discounts, mail-in rebates, retail and online purchase options). Some of the products discounted are well-known by all customers such as dehumidifiers and room air conditioners, but others, such as smart thermostats and Tier 1 smart strips, are less well known. Depending on the product type, we will ask about customers awareness and/or use of the product. We will also explore customer perceptions of the benefits of the energy efficient versions of the products and their willingness to pay to receive those benefits.

Finally, 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.

Upon survey completion, the team will analyze the data and present evaluation results in a stand-alone memo. The memo will detail the methods for estimating non-participant spillover, as well as how the value will be applied to program savings going forward. Survey fielding and analysis will be completed in time to meet the September 1st deadline for initial NTG recommendations.

4. Business Program Evaluation Efforts

In this section, we outline the anticipated evaluation activities for each of the Business Program Initiatives. The research proposed for this program is particularly important as AIC rolls out energy efficiency offerings to a different eligible population than in the past. More specifically, with the exclusion of 10 MW customers (who historically participated heavily in AIC programs) as well as the addition of public-sector customers, AIC and its implementation contractors are serving a different market. As such, the evaluation team has proposed early and targeted research to help identify and address any challenges to implementation and savings generation, or barriers to program participation.

4.1 Standard Initiative

The Standard Initiative offers AIC business customers fixed incentives for the installation of prescriptive energy efficiency measures. The core Initiative provides incentives for lighting, variable frequency drives (VFDs), HVAC, steam traps, compressed air leak repair, and other measures, obtained by applying for a rebate through AIC. In addition, the Standard Initiative offerings are available to AIC's business customers through other channels:

- The Instant Incentives offering provides mid-stream incentives to customers purchasing lighting products at distributor retail locations to help increase the market share of efficient lighting products.
- The Ameren Illinois Business Customer Online Store (Online Store) is available to all electric business customers and offers a variety of energy-saving lighting products, including LEDs, occupancy sensors, and smart power strips.

The Standard Initiative is designed to serve business customers of all sizes including small, medium, and large businesses. However, the Initiative is a critical participation channel for AIC's small customers, who in past years were targeted by a series of stand-alone IPA-approved energy efficiency programs. In 2018, the Standard Initiative will newly include a Small Business offering, providing direct install energy efficiency measures to AIC's small (primarily DS-2 and/or GDS-2) customers.

Table 12 outlines the planned evaluation activities for the Standard Initiative.

Table 12. Standard Initiative Evaluation Activities – Four Year Plan

Timing	Activity	2018	2019	2020	2021
Annual	Initiative Material & Database Review	✓	✓	✓	✓
	Initiative Staff Interviews	✓	✓	✓	✓
	Engineering Desk Review	✓	✓	✓	✓
	On-Site Verification (Small Business offering)	✓			
	IL-TRM Application Review	✓	✓	✓	✓
	Net Impact Analysis – SAG Approved NTGR	✓	✓	✓	✓
Phased	Core Participant Survey (NTG)	✓		✓	
	Core Participant Survey (Process)		✓		✓
	Small Business Participant Survey (NTG)	✓		✓	
	Small Business Participant Survey (Process)		✓		✓
	Online Store Participant Survey (Process & NTG)		✓		✓

Timing	Activity	2018	2019	2020	2021
	Instant Incentives Survey (NTG)		✓		✓

We proposed the evaluation activities included in Table 12 for the following reasons:

- 2018: The focus of the 2018 evaluation is primarily on assessing Initiative impacts.
  - In addition, the evaluation team will conduct quantitative Internet surveys with customers who have completed a project through the Standard Initiative's core (application-based) offering and Small Business (direct install) offering in 2018. The surveys will focus on assessing free-ridership and participant spillover for Standard Initiative measures, and will include limited questions to verify measure purchase and installation as well as to assess Initiative processes. As part of the NTG research effort, the evaluation team plans to conduct cognitive interviews to ensure participant comprehension of the concepts and questions being asked of them.
  - Given that the Small Business (direct install) offering is being delivered by a new implementer in 2018, we will conduct on-site verification for a sample of these projects to verify measure installation.
- 2019: The evaluation team will focus on updating NTGRs for the Online Store and Instant Incentives offerings during 2019. In addition, the evaluation team will conduct a thorough process evaluation of the core Standard offering and the Small Business offering.
- 2020 and 2021: During the last two years of the 2018 Plan period, the evaluation team will alternate between a focus on Initiative energy savings impacts and NTG for the core and Small Business offerings (2020) as well as deeper dives into the participation process for the core and Small Business offerings and NTG for Instant Incentive and the Online Store (2021). If changes are made to the Initiative in these years, the evaluation team may change the order in which this research is conducted.

4.2 Custom Initiative

The Custom Initiative allows AIC business customers to complete energy efficiency projects that involve the installation of equipment not covered through the Standard Initiative. The availability of this Initiative allows customers to propose additional measures and tailor projects to their facility and equipment needs. Custom Incentives are available for electric measures, such as lighting, compressed air, energy management systems (EMS), and industrial process measures, among others. The Initiative also offers gas measures, including heat recovery, process heat, and improvements to steam systems.

The Custom Initiative also includes a number of incubator offerings such as Metering and Monitoring, Strategic Energy Management (SEM), Staffing Grant, and Feasibility Studies.

- The Metering and Monitoring offering promotes customers' ability to review and curtail their energy use using sub-meters and software.
- The SEM offering is designed to help customers achieve ongoing energy and cost savings through motivating changes in participants' organizational culture and business practices to achieve energy reduction and cost savings goals.

- The Staffing Grant offering provides customers with funding to help address energy efficiency project staffing needs. The offering distributes funds based on the predicted savings that will be achieved by the grant recipients.
- The Feasibility Study offering helps participants define project costs and energy savings opportunities, primarily targeting manufacturing/industrial facilities with compressed air systems.

Given these activities, we propose the following evaluation plan for the Custom Initiative.

Table 13. Custom Initiative Evaluation Activities – Four Year Plan

Timing	Activity	2018	2019	2020	2021
Annual	Initiative Material & Database Review	✓	✓	✓	✓
	Initiative Staff Interviews	✓	✓	✓	✓
	Engineering Desk Review	✓	✓	✓	✓
	On-Site Measurement & Verification	✓	✓	✓	✓
	Staffing Grant Interviews	✓	✓	✓	✓
	Net Impact Analysis – SAG Approved NTGR	✓	✓	✓	✓
Phased	Core Participant Survey (Process & NTG)	✓		✓	
	Incubator Offering Process Research	✓	✓	✓	✓

We proposed the evaluation activities included in Table 13 for the following reasons:

- **2018**: In addition to annual impact evaluation activities, the 2018 evaluation will include interviews with Custom participants to assess program processes and decision-making to inform an updated NTGR for the Initiative.
  - Given the change in the eligible customer base for AIC's Business Program since NTG research was last conducted in PY8 (June 2015 – May 2016), it is important to speak with participants in the 2018 program to update this value. Process research with participants in the incubator offerings is also valuable for the same reason. As part of the NTG research effort, the evaluation team plans to conduct cognitive interviews to ensure participant comprehension of the concepts and questions being asked of them.
- **2019**: Targeted process research for the incubator offerings will continue in 2019 as these offerings traditionally see varying levels of participation year over year, as well as tweaks to implementation.
- **2020 and 2021**: During the last two years of the 2018 Plan period, the evaluation team will alternate between a focus on deeper dives into the participation process and NTG (2020) and energy savings impacts (2021). If changes are made to the Initiative in these years, the evaluation team may change the order in which this research is conducted.

4.3 Retro-Commissioning Initiative

The Retro-Commissioning (RCx) Initiative helps AIC business customers evaluate their existing mechanical equipment, energy management, and industrial compressed air systems to identify no-cost and low-cost efficiency measures to optimize existing energy-using systems. Over time, deferred maintenance and changing operating directives and practices can lead to inefficient operation of building systems. RCx is a process that

examines current operations relative to the needs of equipment owners and those served by the equipment and determines opportunities for increasing equipment efficiency through maintenance, system tune-ups, scheduling, and optimization of operations. Most of the identified measures require little, if any, capital funds to implement.

Given these activities, we propose the following evaluation plan for the RCx Initiative.

Table 14. Retro-Commissioning Initiative Evaluation Activities – Four Year Plan

Timing	Activity	2018	2019	2020	2021
Annual	Initiative Material & Database Review	✓	✓	✓	✓
	Initiative Staff Interviews	✓	✓	✓	✓
	Engineering Desk Review	✓	✓	✓	✓
	On-Site Measurement & Verification	✓	✓	✓	✓
	Net Impact Analysis – SAG Approved NTGR	✓	✓	✓	✓
Phased	Participant Survey (Process & NTG)		✓		✓
	RCx Service Provider Interviews	✓		✓	
	Persistence Research	TBD			

We proposed the evaluation activities included in Table 14 for the following reasons:

- **2018**: In 2018, the evaluation team will focus on conducting rigorous impact evaluation of the RCx projects completed in 2018. As feasible, we plan to review and analyze projects throughout the calendar year to minimize end of year and first quarter data collection. We also plan to conduct interviews with RCx service providers (RSPs), who work directly with customers to implement projects.
- **2019**: The second year of evaluation will move beyond impact evaluation to include process and NTG surveys with participants in the Initiative. As part of the NTG research effort, the evaluation team plans to conduct cognitive interviews to ensure participant comprehension of the concepts and questions being asked of them. Results from these interviews will be used to update the survey instrument as needed before full fielding begins.
- **2020 and 2021**: During the last two years of the 2018 Plan period, the evaluation team will alternate between explorations of the RSP perspective (2020) and that of the participating customers (2021). If warranted, the evaluation team may update this schedule to conduct research with both groups in the same year.
- **Persistence Research:** We plan to review the results of persistence research currently underway by the ComEd evaluation team once this research becomes available. At that point, we will explore the potential for persistence research specific to AIC retro-commissioning projects.

4.4 Streetlighting Initiative

New in 2018, the Streetlighting Initiative is designed to encourage municipalities to upgrade their streetlighting from HID to LED technology and will include streetlighting, area lighting, decorative lighting, and protective lighting. Program staff supporting AIC's public sector customers will be responsible for conducting outreach around this Initiative. AIC anticipates two types of participants in this offering; the first group of participants consists of municipalities that own their own streetlighting, while the second group consists of

municipalities with AIC owned streetlighting. For the first group, AIC will offer incentives for municipalities to upgrade their existing streetlighting. For the second group, AIC will incentivize municipalities to update their streetlighting ahead of AIC planned upgrades upon burnout. If interested, these municipalities will pay a fee to upgrade their streetlighting early and AIC will offer an incentive to bring down that fee.

Table 15 outlines the planned evaluation activities for the Streetlighting Initiative.

Table 15. Streetlighting Initiative Evaluation Activities – Four Year Plan

Timing	Activity	2018	2019	2020	2021
Annual	Initiative Material & Database Review	✓	✓	✓	✓
	Initiative Staff Interviews	✓	✓	✓	✓
	Engineering Desk Review	✓	✓	✓	✓
	Gross Impact Analysis – Algorithm-Based	✓	✓	✓	✓
	Net Impact Analysis – SAG Approved NTGR	✓	✓	✓	✓
Phased	Process Model Development	✓			
	Il-TRM Algorithm Development	✓			
	Participant Survey (Process & NTG)	✓		✓	

We proposed the evaluation activities included in Table 15 for the following reasons:

- 2018: During the first year of this offering, the evaluation team will conduct detailed impact and process evaluation activities to ensure the Initiative is implemented as planned and achieves energy savings for AIC customers.
  - As part of this process, the evaluation team will document the implementation process and speak with municipalities directly about their experience with the Initiative. If possible, surveys will be web-based so that they can be administered on a rolling basis.
  - The evaluation team will also use the participant survey to explore attribution and develop a streetlighting-specific NTG recommendation for future application.
  - Given that the IL-TRM does not currently include an algorithm for streetlighting, the evaluation team will use the 2018 impact evaluation process to prepare a workpaper for submission to the IL-TRM Technical Advisory Committee (TAC).
- 2019: After targeted process evaluation in 2018, the evaluation team will focus its 2019 efforts on annual impact evaluation activities.
- 2020 and 2021: During the last two years of the 2018 Plan period, the evaluation team will alternate between process and impact evaluation (2020) and impact evaluation alone (2021).

4.5 Cross-Cutting Business Program Research

As in past years, we will conduct cross-cutting Business Program evaluation activities to inform the overall implementation approach to serving non-residential customers in AIC territory. Given the change in eligible population and the types of offerings (e.g., integrated offerings for public sector and small businesses) there is a need for targeted research to support AIC's program implementation. We have begun a number of research tasks in the Transition Period and will continue these activities throughout the 2018-2021 cycle.

We plan to complete three types of cross-cutting evaluation activities during the 2018-2021 cycle.

- First, we plan on a year-by-year basis to complete research tasks that inform multiple Business Program initiatives. This will include a Business Program non-participant survey, interviews with Business Program Energy Advisors, Business Program trade allies, AIC Key Account Executives, and other ad hoc research as needed.

- During 2018-2019, we will also conduct a historic participation analysis and customer profiling activity, leveraging all of AIC's historic business participation data and business customer information to develop a deeper understanding of AIC's non-residential customer base. These activities will inform future evaluation work, program design, and help more fully understand the demographics and firmographics of participants in AIC's Business Program.

Finally, throughout the 2018-2021 cycle, we plan to complete targeted non-residential market assessments based on AIC and stakeholder interest, as well as the results of the various research activities we have presented here. For example, building off research we conducted in the Plan 3 cycle, we are currently in process of scoping a non-residential lighting market assessment.Table 16 presents currently planned cross-cutting research activities. The evaluation team will assess the need for each of these activities as we progress through the cycle and revise accordingly, but we will complete at least one assessment of Business Program non-participant spillover (NPSO) during this plan period.

Table 16. Cross-Cutting Business Program Research Activities by Year

Activity	2018	2019	2020	2021
Targeted Market Assessments	✓	✓	✓	✓
Non-Participant Survey (including NPSO)	✓		✓	
Energy Advisor Interviews	✓		✓	
Trade Ally Interviews	✓		✓	
Key Account Executive Interviews		✓		✓
Historical Participation Analysis	✓			
Customer Profiling		✓		

5. Portfolio-Level Evaluation Activities

As part of the evaluation process, the team will also perform a number of annual portfolio-level activities. We describe each of these activities within the following sections.

5.1 Statewide Technical Reference Manual

5.1.1 Participation and Review

The team will continue its involvement in the IL-TRM process, including participation in TAC meetings and NTG Methodology Working Group meetings. For the TAC, this will include participation in weekly calls, as well as reviewing and commenting on IL-TRM update items presented to the TAC and reviewing and providing feedback on updated drafts of the IL-TRM that are released to SAG for comment. For the NTG Working Group, 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 IL-TRM as needed.

5.1.2 Research to Update the IL-TRM

Over the course of the 2018 Plan cycle, 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.

In addition to the measure specific research outlined in Table 17, the evaluation team will submit work papers with updated IL-TRM assumptions and inputs based on program- and initiative-specific research efforts outlined elsewhere in this plan. Further, we will continue to coordinate with other evaluation teams in the state on research related to Effective Useful Life (EUL).

Table 17. Planned IL-TRM Research Activities

Research	2018	2019	2020	2021
Residential Smart Thermostat Study		✓		
Business Smart Thermostat Study	TBD - Based on SW Collaboration			
Steam Trap Impact Study	✓	TBD – Based on results of scoping		
Behavioral Persistence Study		✓		✓
HVAC AMI Disaggregation and Savings Analysis			✓	

Below, we provide additional detail on the planned research activities. Note that these studies are all in the process of being scoped, and details may change in response to needs within Illinois and availability of populations from which to sample.

Residential & Business Smart Thermostat Studies

Smart thermostats have not been heavily incented by AIC in the past, but a number of these measures are planned for the 2018-2021 cycle. In particular, during the 2018-2021 cycle, AIC is delivering smart thermostats to customers through a number of channels, including the:

- Residential HVAC Initiative
- Residential Retail Products Initiative
- Residential Income Qualified and Public Housing Initiatives
- Business Standard Initiative

As such, we plan to conduct smart thermostat-specific research during the cycle as described below.

Residential

The IL-TRM currently includes a residential measure that quantifies energy savings for smart thermostats. However, energy savings estimates are based on studies conducted by the evaluation teams for ComEd, Nicor Gas, Peoples and North Shore Gas, and do not reflect AIC customers, as smart thermostats had largely not been installed in AIC territory.

As a result, we plan to conduct an AIC-specific smart thermostat impact evaluation, using quasi-experimental methods, that produces rigorous estimates of smart thermostat electric and gas impacts for residential customers in AIC territory. Results of this evaluation will be used to update the IL-TRM. We expect to conduct this study in mid- to late 2019 to allow for a sufficient number of measures to be incented before we begin our research. To the degree possible based on available data, we will attempt to assess whether there are any differences in savings achieved between low income and non-low income households receiving smart thermostats.

Business

The IL-TRM does not currently include an entry for smart thermostat installations specific to business customers. Because business customer usage and behaviors differ significantly from residential customers, we believe that it is possible smart thermostat impacts for business customers may be significantly different from residential customers, and believe that an IL-TRM measure specific to business smart thermostats should be developed.

However, AIC plans to incent only a small number of smart thermostats for business customers during the 2018-2021 cycle, limiting available sample size. Given this, the evaluation team plans to monitor the adoption of these measures during 2018 and continue to discuss evaluation options with the other Illinois evaluation teams. We expect the most viable path forward would be a statewide small commercial programmable thermostat study, combining populations incented by all Illinois utilities to allow for an evaluation with sufficient statistical power.

Steam Trap Impact Study

Efficient steam traps are currently the single largest contributor to AIC's gas savings. An IL-TRM measure for steam trap replacement/repair currently exists, but a number of assumptions in the TRM are either dated or based on information that is not specific to Illinois. Given the importance of this measure, we believe a study to verify steam trap impacts is desirable.

In 2018, we will work with the Nicor Gas, Peoples Gas, and North Shore Gas evaluation teams to conduct background research to support a study on the impacts of efficient steam traps. Our work will begin with research to understand 1) what data currently exist to support estimation of steam trap impacts, 2) what the available population of participants that have installed steam traps through energy efficiency programs in

Illinois is, and 3) exploring available evaluation methods. We plan to deliver a memorandum summarizing the results of this research by June 30, 2018.

If our background research determines that a study is feasible, we will develop a scope of work immediately thereafter (to be submitted no later than July 31, 2018) and proceed with conducting this study as soon as possible. If reasonable, we will conduct this study in 2018 to inform the 2019 TRM update process.

HVAC AMI Disaggregation and Savings Analysis.

In 2020, we plan to conduct an interval metering analysis, disaggregating loads into HVAC and other end-uses and analyzing the data in comparison to a matched control group to estimate savings from HVAC participation. This task is dependent on the availability of AMI data for a sample of participants and a larger group of nonparticipants to develop a matched control group.

5.2 Cost-Effectiveness Analysis

During the 2018-2021 cycle, the AIC evaluation team will conduct AIC's cost-effectiveness analysis based on results from each program year. We expect to conduct a number of preliminary activities during 2018, including validation of our cost-effectiveness model against past results to ensure consistency in analysis, followed by yearly cost-effectiveness analysis to be completed after program evaluation reports are finalized. Our analysis will comply with all Illinois-specific guidance, including the TRC provisions included in the Illinois Energy Efficiency Policy Manual. In addition, during the 2018-2021 cycle, we plan to conduct research around other impacts of AIC's energy efficiency programs, detailed in Sections 5.3 and 5.4.

5.3 Employment Impacts Research

During the development of the 2018-2021 portfolios and evaluation plans, several stakeholders in Illinois expressed interest in quantifying the impacts of AIC's energy efficiency portfolio have on employment in Illinois. We plan to estimate these impacts yearly beginning in 2018.

A wide range of methods for estimating these impacts exist, and we believe it is important to collaborate with the ComEd evaluation team (and, if relevant, the Nicor/North Shore/Peoples Gas evaluation teams) to ensure consistent methodology throughout Illinois. We plan to begin conversations around this topic in 2018, to allow for discussion and agreement on consistent methodology before we produce estimates for 2018. Given the need for coordination, we do not provide specifics around our planned approach for estimation of employment impacts at this time. However, at minimum, we expect to produce estimates of employment impacts at the overall (portfolio) level, though we may examine effects at a more granular data if it proves feasible for all evaluation teams to do so.

5.4 Non-Energy Benefits Research

Throughout the 2018-2021 evaluation cycle, the team will conduct research around NEBs associated with AIC's programs. At present, we have specific plans to explore NEBs associated with the Income Qualified, Public Housing, and Multifamily initiatives in 2018 as we recognize that these initiatives provide services to customers of lower incomes who may benefit from these programs to a degree not currently captured in evaluation. In addition, we will explore the degree to which NEBs may exist for all of AIC's other initiatives through screening questions in any participant surveys fielded in 2018 and 2019. Based on those findings, we will develop plans for additional research to support the quantification of NEBs.

The evaluation team will use early 2018 evaluation activities such as in-depth interviews with program staff and a detailed review of program materials, such as implementation plans, to determine which NEBs are likely of interest per initiative. As noted above, we will also include a handful of questions on participant surveys planned for 2018 and 2019 to gather data regarding potential NEBs per initiative. Collectively, this information will inform our research strategy in this area. At a minimum, we expect to explore health and safety improvements for residential initiatives.

In addition to determining which NEBs to study, the evaluation team will coordinate with the ComEd evaluation team on the methods used to quantify NEBs. We have already begun these conversations with other evaluation teams and plan to continue them throughout the cycle. We also plan to discuss NEBs with the SAG to ensure a consistent understanding outside of program evaluation teams on how NEBs will be researched.

5.5 Job Training Process Research

During the 2018-2021 cycle, AIC plans to invest in an initiative to increase the capacity for delivering energy efficiency programs in its territory. This effort will include a focus on development of energy efficiency jobs in disadvantaged communities. The evaluation team plans to monitor this effort throughout the cycle and will explore the possibility of conducting a process evaluation of the effort when it appears warranted.

5.6 QA/QC Process

Per our contract, the team must also hire a separate entity for quality assurance/quality control (QA/QC) review and work collaboratively with this entity to ensure the quality of our evaluation plans, analysis, and reporting. For the last two cycles, the team has worked with Dr. Richard Ridge, who has an extensive background in energy efficiency evaluation. In recent years, Dr. Ridge has used his expertise to help write evaluation protocols and oversee other firms in their evaluation efforts, as well as continuing to perform evaluations across the country. For several years, Dr. Ridge was a consultant to the California Public Utilities Commission (CPUC) evaluation staff, where he worked with them to understand evaluation needs, review contractor plans, and participate in many aspects of a multi-million-dollar evaluation effort. Since 2008, he has been providing similar support to the New York State Department of Public Service.

As part of the 2018 Plan evaluation effort, Dr. Ridge will continue to (1) discuss portfolio evaluation plans with the evaluation team, providing advice as needed; (2) participate in ongoing sampling and evaluation design efforts as requested; (3) review draft evaluation reports to ensure quality and accuracy; and (4) provide the ICC with a report on the efforts in which he was involved at the end of each year.

5.7 Reporting

Opinion Dynamics plans to provide five major types of reports that meets the Illinois statutory requirements for independent evaluation.

- Annual program impact evaluation reports
- Annual integrated impact evaluation report
- Process and forward-looking evaluation memos
- Annual integrated process/forward looking evaluation report

- Annual cost effectiveness report

5.7.1 Annual Program Impact Evaluation Reports

As outlined in this plan, AIC's 2018-2021 Energy Efficiency Plan is comprised of two programs; the Residential Program and the Business Program. Within each program, multiple initiatives target different technologies and groups of customers. As such, we will issue two program-level impact evaluation reports (one each for the Residential and Business Programs). These reports will summarize the following information for each program:

- First-Year Savings
  - Ex ante gross and net savings (electric energy, electric demand, and gas energy)
  - Verified ex post gross and net savings (electric energy, electric demand, and gas energy)
  - Program-level gross realization rates (electric energy, electric demand, and gas energy)
  - Program-level NTGRs (electric and gas)
  - Gas savings to electric savings conversion where relevant
- Cumulative Persisting Annual Savings
  - Program-level weighted average measure life (WAML)
  - Measure-level effective useful life (EUL)
  - Year-by-year incremental verified ex post net savings
  - Yearly expired persisting savings
- Participation and program touch (where relevant)
  - Project counts
  - Participant counts
  - Ex ante and verified ex post measure quantities

Where appropriate, the annual program impact evaluation reports will also present the information listed above broken down by program initiative. Additionally, the annual program impact evaluation reports will include appendices containing the following:

- Impact evaluation methodology
- Methodology and results for impact parameter estimates derived from the evaluation (e.g., updated in-service rates [ISRs] or hours of use [HOU] for lighting measures), where relevant. These estimates may be used to inform recommendations for future IL-TRM updates, or, where prescribed by the IL-TRM, to inform evaluation impact estimates.

The draft annual program impact evaluation reports will be delivered by March 15 of the year following the year of program evaluation (e.g. the 2018 draft annual program impact evaluation reports will be delivered by March 15, 2019). The final reports will be delivered by April 30 of the same year.

5.7.2 Annual Integrated Impact Evaluation Report

Results from the two annual program impact evaluation reports will be combined in a single integrated impact evaluation report for each year. In addition to the program-specific detail above, this report will include information on the deemed cumulative annual persistent savings to allow for an overall assessment of whether or not statutory goals were met by the programs. The final annual integrated impact report will be delivered by April 30 of the year following the year of program evaluation.

5.7.3 Process and Forward-Looking Evaluation Memos and Report

When process or other forward-looking evaluations (including updated research around NTGRs) are conducted, the evaluation team will issue separate memos summarizing the results of these evaluations as needed. These memos may be issued at the program or initiative level depending on the research conducted.

On an annual basis, the evaluation team will also combine results from process and other forward-looking evaluation activities in an annual integrated report.

5.7.4 Annual Cost-Effectiveness Report

On a yearly basis, the evaluation team will issue a report summarizing the results of the annual cost-effectiveness analysis.

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