Opinion Dynamics

Boston | Headquarters

617 492 1400 tel
617 497 7944 fax
800 966 1254 toll free

1000 Winter St
Waltham, MA 02451

Evaluation of the 2016 (PY9) Ameren Illinois Company Residential Multifamily Program

Final

February 12, 2018

CADMUS

NAVIGANT

MichaelsEnergy

Opinion Dynamics

Contributors

Hannah Howard
Managing Director, Opinion Dynamics

Ann Speers Collier
Principal Consultant, Opinion Dynamics

Matt Drury
Director, Engineering, Opinion Dynamics

Dan Hudgins
Senior Consultant, Opinion Dynamics

Hilary Polis
Consultant, Opinion Dynamics

Marion Cundari
Consultant, Engineering, Opinion Dynamics

Opinion Dynamics

Table of Contents

Opinion Dynamics

Table of Tables

Table of Figures

1. Executive Summary

This report presents results from Program Year 9 (PY9) of the Ameren Illinois Company (AIC) Multifamily Program, which was implemented from June 1, 2016 to May 31, 2017. The AIC Multifamily Program offers financial incentives and technical services that enable multifamily housing property owners and property managers[1] to achieve energy savings (electric and gas) and lower operating costs via energy efficient upgrades. The program's incentives are priced to offset the entire cost of the upgrade, essentially making the upgrades free to the property owner. Most measures are provided with a full direct-install service,[2] and administrators implement the program using a hybrid approach that leverages both the staff from the program's implementation vendor, CLEAResult, and program allies, which are local and regional insulation and air sealing contractors.

As a result of PY9 installations, the AIC Multifamily Program was expected to contribute 4% of the overall PY9 portfolio's electric savings (6,461 MWh) and 3% of the overall portfolio's gas savings (156,503 therms). These goals represented a decrease relative to PY8. In addition, this program was part of the Illinois Power Agency (IPA)/8-103 expansion, and we provide results from the evaluation of the stand-alone IPA Multifamily Program in a separate report. Hereafter, except where noted, "Ameren Illinois Multifamily Program" refers to both the IPA and Ameren Illinois Company (AIC) Multifamily Programs and "AIC Multifamily Program" refers exclusively to the AIC Program. Program specifics are discussed in more detail later in this report.

PY9 evaluation activities for the AIC Multifamily Program include interviews with program allies, a program benchmarking review, and an impact evaluation. We also reviewed program materials and program-tracking data, and interviewed program administrators and implementation staff. Given the recent passage of the Illinois Future Energy Jobs Bill (SB 2814), many of our PY9 evaluation activities include reflections on the program's historical performance, as well as suggestions for best practices to for future program years. Below, we present the key findings of the PY9 AIC Multifamily Program evaluation.

Program Impacts

Overall, the ex post net savings from the PY9 AIC Multifamily Program were 4,444 MWh, 0.79 MW, and 162,233 therms (Table 1). The evaluation team verified all program measures through a review of the program-tracking database and application of the Illinois Statewide Technical Reference Manual for Energy Efficiency Version 5.0[3] (IL-TRM V5.0). Based on this review, the program achieved a 103% realization rate for gross electric savings and a 109% realization rate for gross gas savings. Differences between ex ante gross and ex post gross savings calculations are due to variances in savings assumptions for specific measures.

[1] We use the term "property manager" to refer to both property managers and property owners.
[2] The exception is programmable thermostats, which the implementer leaves for the property maintenance staff to install.
[3] Illinois Statewide Technical Reference Manual for Energy Efficiency Version 5.0. Effective June 2016.

Table 1. PY9 Gross and Net Multifamily Program Impacts

	Ex Ante Gross	Gross Realization Rate	Ex Post Gross	NTGR[a]	Ex Post Net
Energy Savings (MWh)					
Total MWh	4,476	103%	4,601	0.97	4,444
Demand Savings (MW)					
Total MW[b]	n/a	n/a	0.82	0.96	0.79
Gas Savings (Therms)					
Total Therms[c]	174,043	109%	189,395	0.86	162,233

[a] The net-to-gross ratios (NTGRs) are estimated at a measure level but are shown in aggregate for the program here.
[b] Ex ante program tracking data provided to the evaluation team did not report PY9 demand savings.
[c] Ex ante gross therms include waste heat penalties for lighting whereas ex post excludes waste heat penalties

The AIC Multifamily Program fell short of electric savings goals in PY9, achieving 69% of the 6,461 net MWh electric goal and 98% of the 164,940 net therm gas savings goal. According to program staff, electric savings were more difficult to achieve in PY9 for two reasons. First, participating properties tended to be smaller complexes; compared to years when the program served very large complexes, serving the PY9 customers required more driving time per unit upgraded and resulted in fewer units served. Second, several property managers turned down the CFLs offered by the program because they wanted to upgrade directly to LEDs. Because AIC was already planning to switch to LEDs in PY10, the implementer was able to work around property managers' uninterest in CFLs by offering a limited number of LEDs ahead of schedule to select properties at the end of PY9.

Key Findings

Findings from our PY9 process research identified similar broad areas of program success and possible improvement, which may be helpful to AIC as it looks towards some design and funding changes upcoming in PY10. Key findings come from in-depth interviews with program allies (n=5) and a program benchmarking review that compares the Ameren Illinois Multifamily Program to similar offerings in other parts of the country.

Specifically, Ameren Illinois had significantly expanded its offerings over the last nine years, leveraging expanded budgets to achieve increased savings among properties that were unlikely to install energy efficient upgrades without the program. As a testament to this successful growth, all allies are satisfied with their PY9 experiences and recall that their air sealing and insulation business in the AIC service territory has expanded over their tenure with the program. Program allies noted that it is becoming more difficult to efficiently serve remaining cost-effective savings opportunities, but suggested ways to overcome this emerging challenge, such as expanding funding for market segments that they see as still having savings opportunities (e.g., low-income multifamily buildings, small towns, and smaller complexes), modifying program guidelines, and/or adding additional measures. The benchmarking and best practices review does suggest that the program is already applying most of the best practices for multifamily programs serving dual-fuel customers; however, possible ways to improve the program include expanding current efforts to coordinate program providers, partner with similar organizations to expand reach, and communicate all energy and non-energy upgrade benefits to property managers. Ameren Illinois may also have an opportunity to act on other best practices in coming years, like standardizing data tracking over the program lifespan to better enable cross-year comparisons, and working longer-term to identify opportunities for timing upgrades with larger building renovation projects.

Overall, comparing Ameren Illinois' day-to-day practices with best practices recommended by industry groups suggest that Ameren Illinois' program is well-positioned to overcome traditional and emerging market barriers in its service territory.

- **Key Finding #1:** Program tracking data for PY9 were generally clean and complete. However, there were some small issues with the ex ante savings assumptions. For example, for common area lighting measures, the implementer applied IL-TRM V5.0 algorithms and inputs for residential dwellings, whereas the evaluation team applied the commercial and industrial algorithms and inputs[4]. Additionally, ex ante savings calculations for faucet aerators were based on single family assumptions rather than multifamily assumptions.
    - **Recommendation #1:** It is important to ensure that the program-tracking platform accurately calculates and claims savings that are representative of actual installation parameters and which reflect the most appropriate assumptions from the IL-TRM V5.0. More specifically, common area lighting measures should reference the commercial and industrial IL-TRM V5.0, while all remaining measures should apply residential multifamily assumptions from the IL-TRM V5.0. By doing a complete quality assurance/quality control (QA/QC) review of all measures, the implementers can minimize data entry errors, however small, and ensure that all algorithms and the assumptions programmed in the program-tracking database reflect best practice.
- **Key Finding #2:** While the Ameren Illinois Multifamily Program relies on program allies to deliver its major measures program offering, a program best practice identified in the program benchmarking exercise, some allies are facing challenges in serving the program as a result of midyear program funding disruptions (PY9 and in past years) and an increasingly-saturated marketplace.
    - **Recommendation #2:** AIC should work closely with program allies and program implementers in the transition period (if possible) and early in PY2018 to help the allies and implementers plan for and navigate changes. Clear and timely communication is an opportunity to enable the program allies to plan for any adaptations needed so they can rely on the program as a dependable part of their business and serve customers in an efficient and effective manner.
- **Key Finding #3:** Most program allies feel that they have already worked through many of the easier-to-serve properties in AIC's service territory and view the remaining buildings as more scattered throughout the territory and less cost-effective to serve. The program benchmarking process identified best practices for addressing saturated markets including expanding offerings for comprehensive upgrades and promoting them through escalating incentives and financing options.
    - **Recommendation #3:** Consider expanding program offerings or guidelines to open-up new cost-effective savings opportunities for program allies. Also consider whether new incentive structures, such as financing options, could help balance the program's budgetary constraints with the need to continue addressing property owners' split incentives.
- **Key Finding #4:** Engaging with organizations that are also involved in multifamily energy efficiency is a best practice for ratepayer-funded programs seeking to expand their reach. AIC staff continue to attend annual landlord association meetings in the Peoria, IL area, and have identified leads from these venues. In

[4] The implementation team used assumptions from the IL-TRM V5.0 Volume 3 (residential measures). The evaluation team determined that the IL-TRM V5.0 Volume 2 (commercial measures) would be more appropriate for common area lighting measures.

addition, program allies have had success marketing the program by actively recruiting property managers at rental property professional association meetings.

- **Recommendation #4:** AIC should continue to build on efforts to market the Multifamily Program via existing networks of multifamily organizations by placing advertisements in housing trade association publications or developing new partnerships with organizations that can provide AIC with a single point of access to a wide variety and number of properties, such as regional housing companies and financial institutions.

2. Evaluation Approach

The Program Year 9 (PY9) evaluation of the Ameren Illinois Company (AIC) Multifamily Program involved both process and impact assessments. In general, the team coordinated evaluation activities between the AIC Multifamily Program and the similar Illinois Power Agency (IPA Multifamily Program).[5]

Starting in January 2018, the program's tenth year will bring another suite of regulatory and funding changes that will again reshape program design and implementation. With the passage of the Illinois Future Energy Jobs Bill (SB 2814), the 8-103/8-104 expansion will end, and thus, IPA program funding will also end. Additionally, the bill carries a requirement for Illinois energy efficiency programs to mark success in terms of persistent savings, rather than first-year savings as administrators have done from PY1 through PY9. These regulatory and funding changes hint that administrators will be considering substantial program redesigns. During this redesign, program administrators and implementers may want to consider the best elements of the PY1-PY9 efforts, in addition to responding to changing regulations. As such, many of our PY9 AIC Multifamily Program evaluation activities incorporate reflections on the program's historical performance as well as suggestions for best practices for future program years.

2.1 Research Objectives

The objective of the PY9 AIC Multifamily Program evaluation was to provide estimates of gross and net electric and gas savings associated with the program. In particular, the PY9 impact evaluation answered the following questions:

1. What were the estimated gross energy and demand impacts from this program?
2. What were the estimated net energy and demand impacts from this program?

The evaluation team also explored process-related research questions as part of the PY9 evaluation.[6] Through these questions, we benchmarked the Multifamily Program (AIC and IPA components) against other multifamily programs and explored the program design and implementation process and potential opportunities to improve program participation.

Program Participation

3. How many projects were completed? By how many different customers? What types of projects?

Program Design and Implementation

4. Has the program changed compared to PY8? If so, how, why, and was this an advantageous change?
5. What implementation challenges have occurred in PY9, and how has the program overcome them?
6. Program Allies
    a. Did program ally participation meet expectations? If not, how different is it and why?

[5] Hereafter, except where noted, "Ameren Illinois Multifamily Program" refers to the both the AIC and IPA Multifamily Programs.
[6] The evaluation team conducted these activities in conjunction with our evaluation of the IPA Multifamily Programs.

b. How do program allies work with property managers to select and install measures?

c. How satisfied were program allies with different aspects of the program?

d. What was the impact of program participation on program allies' business and practices?

e. What changes would program allies suggest to improve the program?

7. Program Benchmarking

a. To set a baseline for benchmarking, what progress towards program goals have the AIC and IPA Multifamily Programs (combined) made since inception? To frame the benchmarking results, what changes are anticipated for PY10?

b. How do the AIC and IPA Multifamily Programs' outcomes compare to other multifamily programs throughout the United States with respect to such factors as multifamily market characteristics, program goals, and program design and implementation?

c. What best practices and lessons learned from other programs could enhance the programs' design and implementation to achieve additional savings?

2.2 Evaluation Tasks

Table 2 summarizes the evaluation activities conducted for the PY9 evaluation of the Multifamily Program.

Table 2. Summary of PY9 Multifamily Program Evaluation Activities

Activity	PY9 Impact	PY9 Process	Forward Looking	Details
Program Staff Interviews		✓		Conducted interviews with AIC, CLEAResult, and Leidos program managers to understand changes in program design and implementation.
Program Materials Review		✓		Reviewed the PY9 database, relevant administrative program reports, and marketing and outreach materials to document program design and changes since PY8.
Program Ally Interviews		✓	✓	Conducted interviews with a sample of program allies to investigate program participation levels, program participation processes, program ally satisfaction, barriers to participation, and impacts of program participation on program ally business and practices.
Program Benchmarking Review			✓	Compiled changes made to AIC/IPA programs since inception; reviewed multifamily program best practices in secondary literature; gathered secondary information about peer programs; and, compared AIC/IPA programs to peer programs.
Impact Analysis	✓			Conducted an engineering analysis of all measures installed during PY9.

Note: All activities were conducted in conjunction with the IPA Multifamily Program.

2.2.1 Program Staff Interviews

In June 2017, the evaluation team conducted in-depth interviews with the AIC program manager, two Leidos oversight managers, and two CLEAResult program managers. The interviews provided the evaluation team with insights about program performance and program changes during PY9.

2.2.2 Review of Program-Tracking Data and Materials

In addition to program staff interviews, the evaluation team reviewed program materials, including the PY9 Multifamily Program Implementation Plan and program marketing materials. The team also reviewed the program-tracking database to examine the type of data that was tracked and to obtain data for both the process and impact analysis.

2.2.3 Program Ally Interviews

Program allies play an important role in marketing and implementing the AIC Multifamily Program. Furthermore, program allies offer an important perspective on the multifamily property market. The team conducted five interviews with participating program allies in PY9. Interviews investigated such topics as program allies' success in bringing projects into the program, barriers to participation, program ally satisfaction, any impacts of program participation on program ally business and practices, and program allies' suggestions for program improvement. In particular, the team used information from these interviews to understand multifamily market saturation from the program allies' perspective.

2.2.4 Program Benchmarking Assessment

Program benchmarking is the "process of gathering, tracking, and assessing a program's current performance against past results in order to measure progress over time, or to compare results to a peer group." The team completed a secondary literature review in support of benchmarking the Multifamily Program. In contrast to the impact analysis, the benchmarking activity considered the combination of both AIC and IPA components in order to facilitate a comprehensive view of multifamily offerings in the AIC service area over time. Specifically, the team documented the AIC/IPA Multifamily Program's evolution over time and compared the PY8 program to other multifamily direct-install programs in the United States. Key sources of information included American Council for an Energy Efficient Economy (ACEEE) multifamily energy efficiency program best practice reports and recent program evaluation reports of comparable multifamily programs.

The team also focused on benchmarking specific program elements, including context (e.g., multifamily market saturation), program design and implementation (e.g., program ally networks, customer marketing strategies, incentives), measure offerings, and evaluated outcomes (i.e., results of impact and process evaluations). Based on the benchmarking results, we recommend best practices and lessons-learned that can enhance the programs' design and implementation to achieve additional savings moving forward. Please see Appendix D for a description of the Program Benchmarking Report detailed methods.

2.2.5 Impact Analysis

Gross Impact Analysis

To determine the gross impacts for the AIC Multifamily Program, we applied the savings algorithms and input assumptions from the IL-TRM V5.0 to the information provided in the program-tracking database. We outline

the algorithms used to calculate all evaluated gross program savings along with all input variables in the Appendix B.

Net Impact Analysis

The evaluation team calculated PY9 ex post net impacts by applying SAG-approved NTGRs to ex post gross savings by measure. Table 3 summarizes the measure-level NTGRs used to calculate PY9 AIC Multifamily Program net savings. As mentioned above, the implementer installed some LEDs at selected properties late in the year, even though LEDs were not slated for installation until PY10. Accordingly, the evaluation team calculated ex post net LED impacts using the SAG-approved NTGR for PY10 in-unit LEDs (0.77) given that it was the most comparable value available. This differs from the implementer's ex ante net approach, in which the PY9 NTGR for in-unit CFLs was applied (0.95). We address this measure addition in more detail in Section 3.1.

Table 3. AIC NTGRs by Measure Category

Measure Category	NTGR	
	Electric	Gas
In-Unit CFL	0.95	n/a
In-Unit LED	0.77	n/a
Common Area CFL	0.83	n/a
Aerator	1.06	1.00
Shower Head	1.00	0.94
Thermostat	1.04	0.98
Air Sealing	0.96	0.81
Attic Insulation	0.88	0.75

2.3 Sources and Mitigation of Error

Table 4 provides a summary of possible sources of error associated with the research activities conducted for this evaluation. We discuss each item in detail below.

Table 4. Potential Sources of Error

Research Task	Survey Error		Non-Survey Error
	Sampling	Non-Sampling	
Program Staff Interviews	▪ n/a	▪ n/a	▪ n/a
Program Ally Interviews	▪ No, census attempt	▪ Measurement error ▪ Non-response and self-selection bias ▪ Data processing error ▪ External validity	▪ n/a
Secondary Data Review	▪ n/a	▪ n/a	▪ Data processing error
Impact Analysis	▪ n/a	▪ n/a	▪ Data processing error

The evaluation team took a number of steps to mitigate against potential sources of error throughout the planning and implementation of the PY9 evaluation.

Survey Error

- Non-Sampling Error:
  - **Measurement Error:** We addressed both the validity and reliability of qualitative data from the program ally interviews through multiple strategies. First, we relied upon the experience of the evaluation team to create questions that, at face value, appear to measure the idea or construct that they are intended to measure. We reviewed the questions to ensure that we did not ask double-barreled questions (i.e., questions that ask about two subjects, but with only one response) or loaded questions (i.e., questions that are slanted one way or the other). We also checked the overall logical flow of the questions so as not to confuse respondents, which would decrease reliability. Key members of the evaluation team, as well as AIC and ICC Staff had the opportunity to review the interview guides and all interviews were conducted by an experienced interviewer.
  - **Non-Response Bias:** Given the response rate of 83% for program ally interviews, the potential for non-response bias is minimal.
  - **Data Processing Error:** The team addressed processing error through organizing interview responses in an Excel tracking file and conducting quality checks on this data.
  - **External Validity:** Given that we attempted a census of the program allies, we did not need to worry about having a sample that was representative of program allies who participated in the program.

Non-Survey Error

- Data Processing Error
  - **Gross Impact Calculations**: We applied IL-TRM V5.0 calculations to the participant data in the tracking database to calculate gross impacts. To minimize data processing error, the evaluation team had all calculations reviewed by a separate team member to verify accurate calculations.
  - **Net Impact Calculations:** We applied the deemed NTGRs to estimate the program's net impacts. To minimize data processing error, the evaluation team had all calculations reviewed by a separate team member to verify accurate calculations.

3. Detailed Evaluation Findings

3.1 Program Description

The Multifamily Program offers incentives and services that enable energy savings and lower operating costs in market-rate multifamily housing. For the past two years, Multifamily Program offerings in AIC service territory have been split between the AIC Multifamily Program and the IPA Multifamily Program[7]. There are three main components offered through the AIC and IPA programs: measures for tenant units, lighting for buildings' common areas, and major measures for air sealing and attic insulation (also referred to as shell measures). The AIC Multifamily Program sponsors all the measures installed in tenant units (CFLs for permanent light fixtures, faucet aerators, low-flow shower heads, and programmable thermostats), some types of common area lighting (standard and specialty CFLs), and major measures for buildings with gas heat. Additionally, while LEDs were not part of the PY9 program offering, the implementer installed LED bulbs at the end of the PY9 program year, in a few complexes where owners refused to take CFLs.[8] The IPA Multifamily Program does not sponsor any in-unit measures, but does sponsor the remaining types of common area measures (occupancy sensors and LED exit signs) and major measures for buildings with electric heat.

Program administrators deliver measures using a hybrid approach that leverages program implementation staff from CLEAResult, as well as program allies. Program delivery still differs somewhat by program component within the AIC program. Specifically, the program implementer conducts outreach and recruitment of participants for the direct installation components of the program (in-unit and common area). The implementer installs all common area lighting and most of the in-unit measures. The exception is programmable thermostats, which the implementer provides to participating property managers for installation by property staff. In contrast, program allies (recruited by the implementer) are responsible for generating leads, bringing customers into the major (shell) measures component of the program, and performing all major measure installations. Table 5 provides a summary of the multifamily offerings available in the AIC service area. Note that the program implementer and program allies present all offerings as a single program to the customer. Major measure offerings are provided at no cost to the property manager, and the discounts for common area lighting and in-unit measures cover measure costs for those aspects of the program.

Where applicable, program allies share leads for direct install components with CLEAResult, so that property managers are exposed to all applicable measures. Although the implementer follows up on all potential direct installation opportunities identified through program allies' major measures site reports, some allies take a more proactive approach to cross-component participation and invite the implementer to join them at on-site meetings where there may be an opportunity to complete direct install measures.

[7] In reference to process evaluation research, "Ameren Illinois Multifamily Program" refers to both the AIC and IPA programs except where noted.
[8] The AIC Multifamily Program is installing LEDs during the transition period from PY9 to PY10, and plans to fully switch from CFLs to LEDs in PY10.

Table 5. Multifamily Program Offerings in the AIC Service Area

Program Component	AIC Program	IPA Program
In-Unit Measures *CFLs for permanent light fixtures, faucet aerators, low-flow shower heads, and programmable thermostats*	Available to any AIC Multifamily customer CLEAResult recruits participants and installs all measures except thermostats, which property manager installs	Not offered
Major Measures *Air sealing and attic insulation*	Available to AIC Multifamily customers with gas heat Program allies recruit participants and install all measures	Available to AIC Multifamily customers with electric heat Program allies recruit participants and install all measures
Common Area Lighting *Lighting measures vary by program*	Available to any AIC Multifamily customer CLEAResult recruits participants and installs lighting (standard CFLs, specialty non-modular CFLs)	Available to any AIC Multifamily customer CLEAResult recruits participants and installs common area measures (LED exit signs, occupancy sensors)

3.2 Program Design and Implementation

The Ameren Illinois Multifamily Program focuses on the market-rate multifamily housing sector. The program's objective is to provide a range of services and incentives that result in lower operating costs and better bottom lines for property managers, as well as lower costs of living and increased comfort for their tenants. Starting in 2018, the program will begin serving low-income multifamily properties. As such, research findings relevant to supporting low income multifamily programs are also presented in this report to provide the program staff with ideas ahead of this change.

Program Design Changes

The AIC Multifamily Program did not undergo any major program design changes in PY9 and the program operated similarly to PY8. As noted above, towards the end of the program year the implementers did offer LED light bulbs for tenant units, in place of the planned-on CFLs, in limited exceptions where property managers refused to accept CFLs.

Program Participation and Goal Achievement

As a result of PY9 installations, the AIC Multifamily Program was expected to contribute 26.3% of the overall PY9 residential portfolio's electric savings (6,461 MWh) and 5.3% of the residential portfolio's gas savings (164,940 therms). To meet these goals, the implementer expected to serve around 10,000 individual multifamily units and 360 buildings during PY9.

Overall, the ex post net savings from the PY9 AIC Multifamily Program were 4,444 MWh, 0.79 MW, and 162,233 therms. Program staff achieved the PY9 AIC Multifamily Program savings through implementation of 669 unique projects at 727 participating buildings.[9] Most projects installed measures through the in-unit

[9] The number of buildings is larger than the number of projects because some project IDs encapsulated upgrades at multiple buildings.

component (N=331) or major measures component (N=282) of the program, with fewer completing common area lighting upgrades (N=74).[10]

By completing these projects, the AIC Multifamily Program achieved 69% of the 6,461 MWh electric goal and 98% of the 162,223 therm gas savings goal. According to program staff, electric savings were more difficult to achieve in PY9 for two reasons: (1) a larger number of smaller complexes enrolled in the program, which required more driving time and resulted in fewer units served, and (2) several property managers turned down the CFLs offered by the program because they wanted to upgrade directly to LEDs. Overall, the program staff attempted to make up for early findings that properties had fewer savings than expected by serving a larger number of properties than planned.

Additionally, the PY9 AIC Multifamily Program achieved significantly lower net savings (Table 1) relative to the PY8 program, which achieved ex post net energy, demand, and gas savings of 6,173 MWh, 1.21 MW, and 279,047 therms, respectively. Compared to the PY8 program, PY9 Program net energy savings declined by 28%, demand savings fell by 35%, and therms savings saw a decrease of 42%. For further context, the PY8 program far outperformed its gas savings goal of 164,940 therms; thus, the PY8 therm savings goal may be a more reasonable basis for comparison. PY9 therm savings (162,223 therms) appear to have held steady in comparison to the PY8 savings goal (164,940 therms).Most of the measures installed through the AIC Multifamily program were split between the in-unit offering (48%) and the major measures offering (41%), while a small share of measures were completed through the common area lighting offering (11%) (Table 6).

Table 6. PY9 AIC Multifamily Program Participation and Projected Savings by Component

Project Type	Measures		Ex Ante Gross Electric Savings		Ex Ante Gross Demand Savings[b]		Ex Ante Gross Gas Savings	
	#	%	kWh	%	kW	%	Therms	%
Direct Install – In-Unit	331	48%	3670	61%	n/a	n/a	69,177	37%
Direct Install – Common Area Lighting	74	11%	1,930	32%	n/a	n/a	n/a	n/a
Major Measures	282	41%	374	6%	n/a	n/a	119,126	63%
Total[a]	**687**	**100%**	**5974**	**100%**	**n/a**	**n/a**	**188,303**	**100%**

[a] Totals may not sum due to rounding.

[b] Ex ante program tracking data provided to the evaluation team did not report PY9 demand savings.

Note: The number of projects is based on unique Project ID. In some cases, there are multiple projects completed at a given property.

3.2.1 Program Benchmarking Key Findings

In this section, we present results of the benchmarking efforts, including an assessment of Multifamily Program barriers, assessments of the program's historical performance, comparisons to peer multifamily programs from Illinois and other states, and recommendations for Multifamily Program best practices and lessons learned that can enhance the program's design and implementation to achieve additional savings moving forward. We discuss benchmarking results in terms of annual ex post savings, participation, measure offerings, and program delivery models. For a detailed explanation of the benchmarking process and methodology please see Appendix D.

[10] The number of measures is greater than the total number of projects because some projects included measures that span multiple components

Program Barriers Assessment

As has been extensively documented, several characteristics of multifamily properties and their ownership structure pose unique barriers to increased energy efficiency, compared to the single-family marketplace. We refer readers to detailed compilations provided by ACEEE.[11] For this benchmarking report, we recapped the main barriers and commented on the extent to which each is a factor for the Ameren Illinois Multifamily Program, based on our knowledge of the program from interviews with program stakeholders in PY7, PY8 and PY9 (including program managers, the implementer, program allies, participating property owners, and tenants). We also drew on this understanding to assess the relative effectiveness of Ameren Illinois' strategies in overcoming pertinent barriers.

Table 7 summarizes common multifamily program barriers reported by ACEEE and others. Results of our comparisons show that while the Ameren Illinois Multifamily Program does face a variety of typical barriers, most are already being addressed as part of the program design and implementation strategy.

Table 7. Program Barriers Assessment

Barrier to Multifamily Energy Efficiency	Description	Presence and Status in AIC Service Territory
Split incentives	▪ Tenants are commonly responsible for paying the electricity bills in multifamily units, while property managers are responsible for the cost of upgrades to multifamily buildings. ▪ Therefore, property managers must pay to finance energy efficient upgrades but their tenants realize the economic benefits from the upgrades, creating a barrier to program participation known as split incentives.[12]	**Present; Addressed.** Many tenants (79%) in AIC's service area are responsible for paying their own electricity bills,[13] indicating that the split incentive issue is present. AIC addresses this issue by offering no-cost upgrades and measures installed in spaces for which property managers are responsible.
Market Saturation	▪ Savings can be more time consuming and costly to achieve for multifamily programs that have already served a high proportion of eligible customers. Market saturation is more common for direct install measures.[14]	**Emerging; Not Yet Addressed.** In PY9, program staff and program allies identified market saturation as an emerging issue. Staff say that they are in the process of understanding the issue to find a solution.
Lack of capital, financing, or resources	▪ Extensive upgrades call for access to capital, which can be a challenge for some property managers. Affordable housing managers are generally not allowed to pass capital costs on to tenants by raising rents.[15] ▪ Property managers must determine how to allocate their limited upgrade resources	**Present; Addressed.** AIC program staff and implementers recognize that resource constraints are a given. Over time, staff have noticed that property managers face the common constraints of time, capital resources, and capacity to schedule upgrades in a way that minimizes tenant disruption. To work around these barriers, the program offerings include no cost measures (addressing capital cost

[11] ACEEE (2014); K. Farley & Mazur-stommen (2014); Johnson (2013); McKibbin (2013); Ross et al. (2016); Vermont Energy Research Organization (2014) and a literature review conducted for Southern California Edison (Opinion Dynamics, 2014).
[12] Johnson, K. (2013). Apartment Hunters: Programs Searching for Energy Savings in Multifamily Buildings. Retrieved from http://aceee.org/research-report/e13n
[13] Opinion Dynamics. (2017). Evaluation of the 2016 (PY8) Illinois Power Agency Residential Multifamily Program. Retrieved from http://ilsagfiles.org/SAG_files/Evaluation_Documents/Ameren/AIU_Eval_Reports_PY8/PY8_AIC_Multifamily_Evaluation_Report_FINAL_2017-02-21.pdf
[14] Ross, L., Jarrett, M., & York, D. (2016). Reaching More Residents: Opportunities for Increasing Participation in Multifamily Energy Efficiency Programs. Retrieved from http://aceee.org/research-report/u1603
[15] Ibid

Barrier to Multifamily Energy Efficiency	Description	Presence and Status in AIC Service Territory
	between energy efficient upgrades and other capital improvements.[16]	barriers) and staff attempt to complete streamlined visits (to minimize management and tenant burden).
Property manager uncertainty about the benefits of installing upgrades	▪ Property managers may have difficulty predicting the full benefits of installing energy efficiency upgrades. This includes challenges of uncertain external factors like fluctuating fuel prices[17] as well as incomplete information on possible non-energy benefits like increased tenant comfort and reduced tenant turnover.[18]	**Extent of Issue Unknown; Procedures in Place to Address as Needed.** AIC created outreach materials to discuss non-energy benefits. In PY9, some allies reported not being aware of these materials.
Challenges meeting program cost-effectiveness requirements	▪ Multifamily programs tend to offer multiple non-energy benefits to both tenants and property managers including reduced tenant turnover, reduced water usage, and increased tenant comfort. These non-energy benefits are generally not considered in cost effectiveness testing, for most utility-run energy efficiency programs. Non-energy benefits are especially relevant for multifamily programs because they provide such a multitude of benefits and these benefits are shared between managers and tenants.[19,20]	**Occasionally Present; Addressed as Needed.** The IPA Multifamily Program struggled to meet cost-effectiveness requirements in PY9 and the program began two months late due to negotiations about program implementation and cost effectiveness requirements. AIC has addressed this as needed through re-negotiating high-level program design to better meet requirements.
Complex decision-making structures	▪ Multifamily projects generally need to go through layers of ownership/manager approval before they can be initiated. ▪ Decision-making about multifamily property upgrades requires time and resources from multiple stakeholders including not only the program implementer, but also the property manager, property maintenance staff, and/or tenants. ▪ More stakeholders are involved when access to tenant units is required.	**Ongoing Challenge, Addressed to Extent Practical** AIC PY9 program staff reported that scheduling time to meet with property managers can be challenging. Furthermore, property managers must then work with tenants to schedule a time for staff to complete upgrades in tenant units, which adds a layer of complexity. To address this issue, allies and implementers work closely with property managers to promote the program.

Program Delivery Model

Historical Performance

[16] Ross, L., Jarrett, M., & York, D. (2016). Reaching More Residents: Opportunities for Increasing Participation in Multifamily Energy Efficiency Programs. Retrieved from http://aceee.org/research-report/u1603
[17] McKibbin, A. (2013). Engaging as Partners in Energy Efficiency: A Primer for Utilities on the Energy Efficiency Needs of Multifamily Buildings and Their Owners. Retrieved from http://www.elevateenergy.org/wp/wp-content/uploads/2014/01/Engaging_as_Partners_in_Energy_Efficiency_Primer_for_Utilities_on_the_Energy_Efficiency_Needs_of_Multifamily_Buildings.pdf
[18] Ibid
[19] Cluett, R., & Amann, J. (2015). Multiple Benefits of Multifamily Energy Efficiency for Cost-Effectiveness Screening. Retrieved from http://aceee.org/research-report/ie1502
[20] Johnson, K. (2013). Apartment Hunters: Programs Searching for Energy Savings in Multifamily Buildings. Retrieved from http://aceee.org/research-report/e13n

Ameren Illinois' overall program design and delivery have stayed relatively constant from year to year, with periodic changes within individual components over time, such as the incentive amounts, installation services, and measures offered through common area, in unit, and major measures components of the program. Table 8 summarizes additional details of the Ameren Illinois Multifamily Program's evolution over time; below the table, we detail some of the key changes.

Table 8. Ameren Illinois Multifamily Program Delivery Models by Program Year

Component	PY1	PY2	PY3	PY4	PY5	PY6	PY7	PY8	PY9
Tenant Units									
Incentives	No cost to property								
Installation	Program ships measures to property manager, who installs them				Implementer installs		AIC implementer installs (IPA does not offer in-unit measures)		
Common Areas									
Incentives	Property manager applies for a prescriptive rebate				No cost to property				
Installation	Property manager coordinates installation by his/her staff or a contractor				Implementer installs		AIC or IPA implementer installs, depending on the measure		
Major Measures									
Incentives	Custom	None offered		No cost to property					
Installation	Custom	n/a		Program allies install all measures and are paid by based on CFM reduction for air sealing and square footage of installation installed					

Note: Changes in measure mix are discussed in Table 10
Source: PY1-PY8 AIC and IPA Multifamily Program Evaluations.

Notable program changes have been:

- **A PY7 change in the Multifamily Program's funding.** With the 8-103/8-104 expansion, the program began receiving additional funding from the Illinois Power Agency (IPA) and, accordingly, program administrators changed the program contracting and accounting practices to accommodate new funding for the in-unit and common area components.

- **A PY5 change in the in-unit and common area components' recruitment, incentives, and installation procedures.** From PY1 to PY4, property managers were responsible for installing in-unit measures; starting in PY5, the program implementer took over this responsibility. The motivations behind this change were to increase participation in the program and to increase the percentage of distributed in-unit measures that were installed. Common area lighting measures also have been a consistent component of the program since PY1. From PY1 to PY4, property managers were responsible for installing common area lighting measures and then applying for rebates from the program; in PY5, the implementer began installing common area lighting measures directly and the program moved to a no-cost model.

- **Program disruptions in the major measures component.** AIC first offered major measures on a custom basis in PY1, including energy audits and incentives for custom measures identified during the audit. AIC stopped offering major measures for two years (PY2 and PY3), and reintroduced them again in PY4 as a prescriptive suite of measures (Table 10 in Section 5.2).

Peer Comparison

The selected multifamily programs all offer a range of program design and implementation elements (Table 9). Most programs—including the AIC and IPA Multifamily Programs—use a mix of tactics including direct install services, discounted or free program ally services and equipment, and product rebates. In its current form,

the AIC Multifamily Program offers three of the distinguishing features: direct installation, free program ally services, and rebates. As mentioned elsewhere, the AIC Multifamily Program's rebates are implemented as direct incentives that fully offset measure costs and make the installation no-cost to the property owner.

The AIC Multifamily Program differs from comparison programs in several ways. A number of programs are open to both income-qualified and market-rate properties, although the AIC Multifamily Program has historically only been offered to the market-rate segment. Financing for energy upgrades tends to be a less popular option, and the AIC Multifamily Program does not currently offer this because the no-cost incentives make it unnecessary. Additionally, as detailed in Table 11 below, the programs offering financing offer custom measures and some higher-cost offerings than the AIC Multifamily Program currently does.

Table 9. Comparison of Multifamily Program Delivery Models

Program	Open to Income-Qualified Properties	Direct Install	Discounted or Free Program Ally Services	Equipment and Product Rebates	Financing Options
Ameren Illinois (combined AIC and IPA)[4]		✓	✓	✓	
BayREN[3]	✓			✓	✓
Con Ed[1]	✓	✓	✓	✓	
National Grid MA[1]	✓	✓		✓	✓
National Grid RI[1]	✓		✓	✓	
Puget Sound Energy[1]		✓	✓	✓	
ComEd, Nicor Gas, and People's Gas[1]		✓	✓	✓	
CNT Energy Savers Program (now Elevate Energy Program)[2]	✓				✓

Notes: Check marks indicate element is part of the program design.
Sources:
1. Johnson, K. (2013). Apartment Hunters: Programs Searching for Energy Savings in Multifamily Buildings. Retrieved from http://aceee.org/research-report/e13n
2. Farley, J., & Ruch, R. (2013). Evaluation of CNT Energy Savers Retrofit Packages Implemented in Multifamily Buildings, (September). Retrieved from http://www.elevateenergy.org/wp/wp-content/uploads/2014/01/Evaluation_of_CNT_Energy_Savers_Retrofit_Packages_Implemented_in_Multifamily_Buildings.pdf
3. Energy Upgrade California. (2015). Bay Area Multifamily Building Enhancements. Retrieved from http://bayareamultifamily.org/sites/default/files/BAMBE workshop fall 2015.pdf
4. PY8 AIC and IPA Multifamily Program Evaluations

Measure Mix

The Ameren Illinois Multifamily Program has offered a relatively constant suite of high-efficiency measures over the years, including low-cost measures for tenant units, standard and specialty lighting for building common areas, and major measures (Table 10). Over time, Ameren Illinois has offered most of the industry-standard upgrades and installations we observed in other administrators' programs, but does not currently provide some measures that are common among other programs (Table 11). For example, the Ameren Illinois Multifamily Program does not offer energy audits (7 of 7 other programs), HVAC (5 of 7 other programs), appliance replacements (4 of 7 other programs), or custom products and services (4 of 7 other programs). The remainder of this section provides additional detail on how the Ameren Illinois Multifamily Program's

measure mix evolved over time and additional details on how the program's current measure mix compares to seven other reference programs.

Historical Performance

The Ameren Illinois Multifamily Program has offered a relatively constant suite of high-efficiency measures since PY4 (Table 10). Participating property manager and tenant surveys in PY5, PY6, PY7, and PY8 suggest that participants have been satisfied with measure quality and the available offerings. A minor area of dissatisfaction has been measure installation quality.

Table 10. Ameren Illinois Multifamily Program Measure Offerings by Program Year

Measure	PY1	PY2	PY3[a]	PY4	PY5	PY6	PY7	PY8
In-Unit Measures								
CFLs[c]	✓	✓	✓	✓	✓	✓	AIC	AIC
Faucet Aerators	✓	✓	✓	✓	✓	✓	AIC	AIC
Low-flow Showerheads	✓	✓	✓	✓	✓	✓	AIC	AIC
Pipe Insulation	✓	✓	✓					
Programmable Thermostats			✓	✓	✓	✓	AIC	AIC
Water Heater Setbacks					✓			
Common Area Measures								
General Lighting[d]	✓	✓	✓	✓	✓	✓	AIC & IPA	AIC & IPA
Major Measures								
Air Sealing				✓	✓	✓	AIC & IPA	AIC & IPA
Insulation				✓	✓	✓	AIC & IPA	AIC & IPA
HVAC[b]				✓				
Custom Measures	✓							
Energy Audits	✓							
Programmable Thermostats				✓	✓	✓		

Notes: Check marks indicate measures offered during the program year. For PY7 and PY8, program funders are listed for measures offered during those years.

[a] In PY3, no customers completed shell measures or installed programmable thermostats

[b] In PY4, no customers installed natural gas furnaces or boilers through the Multifamily Program. Since that date, multifamily properties have had access to incentives for HVAC upgrades through the AIC Heating and Cooling Program for single units and through the AIC Business Program at the building level.

[c] The AIC Multifamily Program plans to switch from CFLs to LEDs in PY10

[d] General lighting includes: LED exit signs, T8 lighting, CFLs and occupancy sensors

Sources:
PY1-PY8 AIC Multifamily Program Evaluations

As shown in Table 10, Ameren Illinois has not offered boilers or furnaces since PY4. While Ameren Illinois offered incentives for natural gas furnaces and boilers under that year's major measures component, property managers did not install any of these measures. Exploring why that had been the case, the implementer learned that multifamily furnaces and boilers are generally replaced on failure and that early replacements for heating and cooling equipment were not cost-effective. In response, Ameren Illinois stopped offering HVAC and boiler equipment through the program. As discussed below, as part of the multifamily program best practices that the program could consider for the future, there may be ways to bring larger, less-common measures back into the program with financing, flexible timing, or other approaches.

Peer Comparison

Table 11 shows that the PY9 Ameren Illinois program offers an industry-standard mix of measures. This is especially true in the case of tenant units and common area lighting, where most programs offer a small set of two to four direct install measures with the most common being lighting, water saving measures, and thermostats. In terms of major measures, however, Ameren Illinois' program offers a relatively small share of the measures that other Investor-Owned Utilities (IOUs) have incentivized. Whereas most of the reference programs are offering approximately four to eight types of major measures, the Ameren Illinois Multifamily Program offers one type (building shell, which includes air sealing and insulation).

Additional major measure offerings offered by other programs include pool pumps, appliance replacements, and upgrades for HVAC systems and domestic hot water systems (e.g., National Grid Rhode Island, Puget Sound Energy, BayRen and the joint program between ComEd, Nicor, and Peoples' Gas). Additionally, several programs (The CNT Energy Savers Program, BayREN, ConEd, and the joint program between ComEd, Nicor, and Peoples') offer customers a free energy audit, during which customers can receive incentives for customized measures suggested to them. Ameren Illinois did offer custom audits in PY1, but removed them from the program once they switched to prescriptive major measures in PY2.

Table 11. Comparison of Multifamily Program Measure Offerings

Measure	Ameren Illinois PY9	BayREN[2]	Con Ed[1]	National Grid MA[4]	National Grid RI[4]	Puget Sound Energy[4]	ComEd, Nicor Gas, and People's Gas[1]	CNT Energy Savers[3]
In-Unit Measures								
Lighting	✓	✓	✓	✓	✓	✓	✓	
Water saving measures	✓	✓	✓	✓	✓	✓	✓	
Programmable thermostats	✓	✓	✓	✓	✓		✓	
Pipe insulation		✓		✓		✓	✓	
Common Area Measures								
Lighting	✓	✓	✓		✓		✓	
Lighting controls/sensors	✓	✓	✓		✓		✓	
Major Measures								
Building shell measures[a]	✓	✓	✓	✓	✓	✓	✓	
Energy audit		✓	✓	✓	✓	✓	✓	✓
HVAC		✓	✓	✓		✓	✓	
Domestic hot water		✓	✓	✓		✓	✓	
Appliance replacements		✓		✓	✓	✓		
Custom products/services		✓	✓	✓			✓	✓
Boilers		✓	✓			✓	✓	
Pool pumps		✓			✓			
Building EMS[b]			✓					

Notes: Check marks indicate measures offered through the program.
[a]Building shell measures include attic insulation, wall insulation, and/or air sealing.
[b]Building energy management systems (EMS).
Sources:
1. ConEd. (2017). 10 Tips to Help You Go Green and Save Some Green. Retrieved from https://www.coned.com/-/media/files/coned/documents/save-energy-money/rebates-incentives-tax-credits/rebates-incentives-for-multifamily-customers/mf-fact-sheet-basic.pdf
2. Energy Upgrade California. (2015). Bay Area Multifamily Building Enhancements. Retrieved from http://bayareamultifamily.org/sites/default/files/BAMBE workshop fall 2015.pdf
3. Farley, J., & Ruch, R. (2013). Evaluation of CNT Energy Savers Retrofit Packages Implemented in Multifamily Buildings, (September). Retrieved from http://www.elevateenergy.org/wp/wp-content/uploads/2014/01/Evaluation_of_CNT_Energy_Savers_Retrofit_Packages_Implemented_in_Multifamily_Buildings.pdf
4. Johnson, K. (2013). Apartment Hunters: Programs Searching for Energy Savings in Multifamily Buildings. Retrieved from http://aceee.org/research-report/e13n

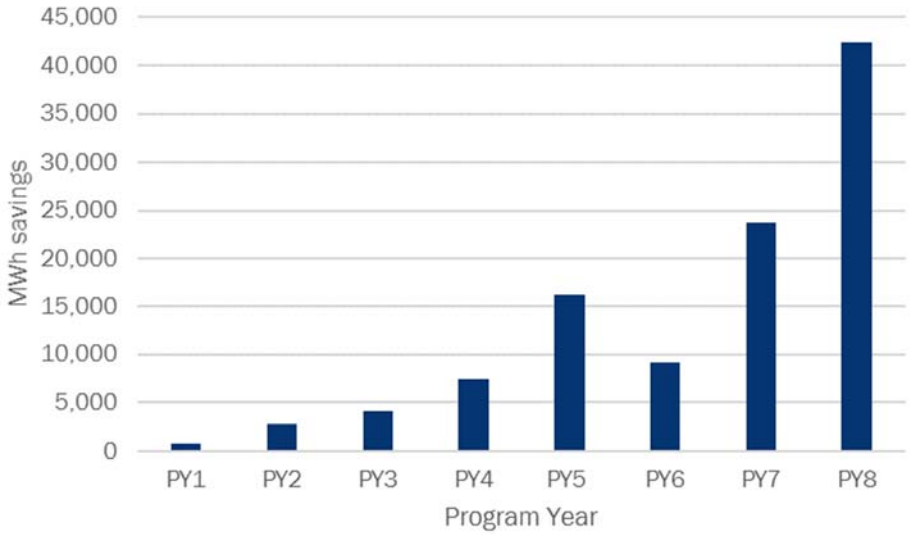
Program Performance

Historical Performance

Program Budgets and Savings

Program implementers and evaluators can use annual program spending, participation, and savings to measure program success. The Ameren Illinois' Multifamily Program budget has dramatically increased over time, from approximately $260,000 in PY1 to over $17 million in PY8 (including funding for both gas and electric savings measures and from both AIC and IPA programs).[21] At the same time, the Ameren Illinois Multifamily Program's electric savings have seen similarly dramatic growth, from 817 MWh in PY1 (ex post net) to nearly 42,400 MWh in PY8 (Figure 1). PY6 program savings dipped somewhat due to program budgets and implementation timeframe that were reduced relative to adjacent years; in particular, the major measures component was only open for three months in PY6[22]. Then, in PY7 and PY8, the program's electric savings further increased when the program received additional funding from IPA to serve electric customers.[23]

Figure 1. Ameren Illinois Multifamily Program Ex Post Net Electric Savings by Program Year



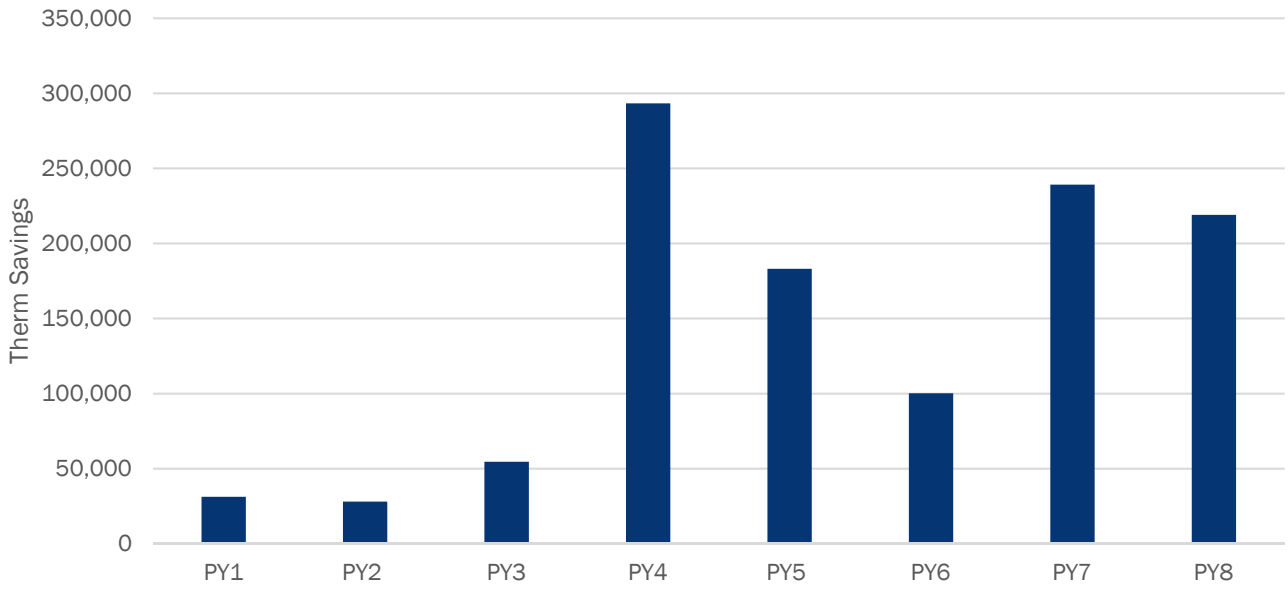
Source: PY1-PY8 Ameren Illinois Multifamily Program evaluation reports
Notes: Data for PY7 and PY8 reflect combined savings from the IPA and AIC programs

Gas program budgets have grown from $270,000 in PY4 to over $700,000 in PY8. During that time, however, gas budgets have declined as a share of total budget, from a high of 25% in PY4 to about 4% to 14% in recent

[21] As indicated by the PY1 program evaluation report and program implementation plans for the Ameren Illinois (AIC and IPA) programs in PY4, PY5, PY6, PY7 and PY8.
[22] Opinion Dynamics. (2015). Impact and Process Evaluation of the 2013 (PY6) Ameren Illinois Company Residential Multifamily Program. Retrieved from http://ilsagfiles.org/SAG_files/Evaluation_Documents/Ameren/AIU Evaluation Reports EPY6/AIC_PY6_Multifamily_Report_FINAL_2015-03-06.pdf
[23] Program activities funded by AIC worked towards distinct energy savings goals and were tracked separately from those funded by IPA. The IPA funding supported program activities for a total of three years (PY7, PY8 and PY9) but will discontinue for PY10. All Ameren Illinois Multifamily Program savings reported in this section are combined figures for both the AIC and IPA programs.

years. Further, some years have seen funding reductions relative to the prior year (PY6, PY7) or shortened implementation timeframes. Accordingly, gas savings have fluctuated over the years (Figure 2). For example, as major measures drive most of the gas savings, savings dipped in PY5 when the program suspended the major measures component midway through the program year when program funding ran out.[24] Additionally, in PY6, the implementation period for the major measures component was only three months.

Figure 2. Ameren Illinois Ex Post Net Therm Savings by Program Year



Source: PY1-PY8 Ameren Illinois Multifamily Program evaluation reports

Program Influence on Customer Decision-Making

Multifamily Program attribution analyses completed as part of annual program evaluations show that, for the most part, the program is reaching property owners who would not have completed energy efficient upgrades outside of the program. Per the Illinois TRM, Multifamily Program attribution is assessed in terms of a NTGR comprised of self-reported participant free-ridership (FR) and spillover (SO). SAG-approved NTGRs for the program have ranged from 80% to 100% in recent years. These NTGRs are within a reasonable range of those used in other multifamily programs.[25]

Peer Comparison

Table 12 compares annual dual-fuel spending, participation, savings between Ameren Illinois Multifamily Program and the selected multifamily programs. In comparison to these selected other programs, the Ameren Illinois program appears to serve a relatively smaller multifamily market and reaches a moderate number of tenant units each year, yet produces a relatively large share of its annual impact via electric savings. Although there are some uncertainties in how well tenant unit counts provided by Ross et al. (2016) correspond to Ameren Illinois tenant unit counts, dividing reported total savings by the number of tenant units served

[24] Ameren Illinois closed the program early because the budgeted funds were exhausted prematurely. At that point, Ameren Illinois made a portfolio-level decision to not shift funds from other programs to continue offering major measures.
[25] NTGRs often vary across programs, reflecting the multiple ways in which regional markets, attribution methods, and program designs influence resulting values. Additionally, NTGRs for a given program may change over time due to shifts in approved attribution methods and algorithms as well as program design changes and market factors.

suggests that Ameren Illinois may be achieving relatively greater savings per unit than other programs.[26] Moreover, the program seems to achieve this by spending somewhat more per-unit than other programs; this may be because the averaging includes spending on major measures. These assessments are provided for directional suggestion only and are not meant to imply a rigorous comparison due to uncertainties in the reporting conventions from the ACEEE report.

Table 12. Multifamily Programs' Participation and Savings

Program	Program Year	Total Number of Eligible Units	Tenant Units Served Annually[1]	% of Units Served Annually	Ex Post Savings (MMBtu)[2]	% Savings from Electric	Approx. Budget Spent/ Tenant Unit[1]	MMBtu/ Tenant Unit[1]
Ameren Illinois[3]	2016	156,103	11,797	8%	166,570	87%	$1,450	14.1
BayREN[4]	2015	700,000	7,512	1%	37,526	34%	$1,200	5.0
Con Ed[4]	2015	2,380,000	38,800	2%	251,862	21%	$300	6.5
National Grid MA[4]	2014	339,698	54,198	16%	259,815	40%	$810	4.8
National Grid RI[4]	2014	76,419	19,867	26%	78,274	51%	$390	3.9
Puget Sound Energy[4]	2014	245,000	31,000	13%	85,044	98%	$440	2.7
ComEd, Nicor Gas, and People's Gas[5]	2013	1,200,000	88,750	7%	622,386	21%	$210	7.0
CNT Energy Savers[5]	2012-2013	401,083	4,126	1%	108,175	8%	$12,770	26.2

Notes and Sources:
1. Figures for the Ameren Illinois Multifamily Program do not include units in buildings that only received major measure upgrades, but we were unable to determine whether other programs included tenant units in major measures-only properties. Therefore, MMBTU/unit figures contain some uncertainties and are presented for directional effects only.
2. All savings are first-year ex post incremental savings. ACEEE was not able to clarify whether savings for non-Ameren programs are gross or net, noting that their source data contained some uncertainties.
3. Eligible units are based on market characterization study completed as part of the PY7 evaluation. All other Ameren Illinois values are from the PY8 IPA and AIC Multifamily Program evaluations. Reports are available at http://ilsagfiles.org/SAG_files/Evaluation_Documents/Ameren.
4. Ross, L., Jarrett, M., & York, D. (2016). Reaching More Residents: Opportunities for Increasing Participation in Multifamily Energy Efficiency Programs. Retrieved from http://aceee.org/research-report/u1603
5. Johnson, K. (2013). Apartment Hunters: Programs Searching for Energy Savings in Multifamily Buildings. Retrieved from http://aceee.org/research-report/e13n

Review of Best Practices

By reviewing secondary materials including Ross et al. 2016's review[27], we identified 13 best practices for multifamily energy efficiency program design. We classified recommendations into three groups:

1. Program considerations that Ameren Illinois is already addressing through "current practice",

[26] Ross, L., Jarrett, M., & York, D. (2016). Reaching More Residents: Opportunities for Increasing Participation in Multifamily Energy Efficiency Programs. Retrieved from http://aceee.org/research-report/u1603

[27] Ross, L., Jarrett, M., & York, D. (2016). Reaching More Residents: Opportunities for Increasing Participation in Multifamily Energy Efficiency Programs. Retrieved from http://aceee.org/research-report/u1603

2. Implementation techniques that Ameren Illinois may be able to start using with a low to moderate level of modification, which we have termed "short-term opportunities," and

3. Program design elements that are not relevant given Ameren Illinois' current regulatory environment, funding, and implementation plans, but which could be good to keep in mind if the situation changes and there is a need/opportunity to redesign program's core structure.

Table 13 summarizes the best practices that we identified and shows our suggested classification.

Table 13. Ameren Illinois Program Progress Towards ACEEE Multifamily Program Best Practices

ACEEE Multifamily Program Best Practice	AIC Status
Partner with program allies to implement and market the program	Current Practice
Integrate direct install measures with more comprehensive program offerings	Current Practice
Offer rebates and program offerings to overcome split incentives	Current Practice
Conduct market characterization surveys; target marketing to appropriate market segments	Current Practice
Coordinate program providers and streamline program offerings to simplify customer access to the program	Current Practice (Could Expand)
Partner with organizations with similar missions to market and support the Multifamily Program	Current Practice (Could Expand)
Effectively communicate the benefits of energy efficiency upgrades to property managers and owners	Current Practice (Could Expand)
Standardize data tracking and reporting methods over the program lifespan	Short-Term Opportunity
Identify opportunities for aligning energy efficiency upgrades with larger building renovation projects	Short-Term Opportunity
Offer an energy audit paired with upgrades that are customized to the participant	Opportunity Would Require Redesign
Expand offerings for comprehensive upgrades through escalating incentives and offering financing options	Opportunity Would Require Redesign
Develop program offerings for both market rate and low income buildings	Opportunity Would Require Redesign

As Table 13 shows, the program is doing a good job of addressing industry-standard best practices for multifamily program design and implementation. The program is currently incorporating eight of the 10 recommendations, and six are part of the program's core design (e.g., developing a program ally network to market the program, targeting marketing to property managers and owners, offering generous product rebates that cover 100% of measure costs to overcome split incentives). Some of the best practices are incorporated to a lesser extent, and might be expanded if budget allows, such as expanding the program's presence to more organizations with similar missions and better disseminating existing outreach materials to all program allies so each ally can best promote the discussed non-energy benefits of the program.

The best practices findings that hold the greatest potential for program improvement are outlined below. For additional details on the best practices that Ameren Illinois is currently following, please see Appendix E.

Practices that Ameren Illinois Could Expand or Consider Adding

The ACEEE best practice reports offered several recommendations, which Ameren Illinois is not currently following or is following in limited scope but could feasibly adopt or improve in the near future. We discuss these recommendations below.

Partner with organizations with similar missions to market and support multifamily programs

Ameren Illinois is currently attending annual landlord association meetings in the Peoria, IL area, and has identified leads from these venues. However, program administrators noted that the program has not yet partnered with other types of organizations that may be open to working with Ameren Illinois, including housing trade groups or regional property management companies. Through PY9, working with affordable housing groups has not been relevant for the Ameren Illinois program because the Illinois Department of Commerce and Economic Opportunity (DCEO) served income-qualified housing in Illinois; however, those types of groups may become relevant in PY10 when the program assumes responsibility for serving these properties. Collaborating with organizations that property managers trust, such as state and local housing organizations to market or even fund the program can be a way of increasing program reach.[28] Organizations that may be of assistance to program administrators include:

- **Financial institutions**: These organizations typically know when multifamily property managers are ready to make upgrades and can serve as a recruitment mechanism for the program.[29]
- **Affordable housing organizations**: Organizations that typically assist low-income customers include affordable housing groups, housing finance agencies, housing trust funds, and community development financing institutions (CDFIs).[30] These organizations also have knowledge about local multifamily markets and the needs of multifamily customers, which can help support marketing efforts.[31] In addition, local housing organizations have connections to a network of property managers and program allies and they may be able to alert program administrators when large retrofit projects come down the pipeline.[32]
- **Housing trade organizations**: Ross et al. (2016) suggest that program administrators should reach property managers through sources they trust, such as housing trade associations, as a way to increase program participation. [33] Midwest-based CenterPoint and Colorado-based Xcel follow this practice by marketing their multifamily programs in their local Multifamily Housing Association's monthly magazine.[34] In PY8, Ameren Illinois began presenting information about the Ameren Illinois Multifamily property manager associations' meetings. According to program staff, these meetings were a "target-rich environment" that generated several new leads for the Multifamily Program.
- **Regional housing companies**: Arizona Public Service (APS) has achieved high participation rates by marketing specifically to owners of multifamily housing companies that operate in their region.[35]

[28] Johnson, K. (2013). Apartment Hunters: Programs Searching for Energy Savings in Multifamily Buildings. Retrieved from http://aceee.org/research-report/e13n
[29] McKibbin, A. (2013). Engaging as Partners in Energy Efficiency: A Primer for Utilities on the Energy Efficiency Needs of Multifamily Buildings and Their Owners. Retrieved from http://www.elevateenergy.org/wp/wp-content/uploads/2014/01/Engaging_as_Partners_in_Energy_Efficiency_Primer_for_Utilities_on_the_Energy_Efficiency_Needs_of_Multifamily_Buildings.pdf
[30] Ross, L., Jarrett, M., & York, D. (2016). Reaching More Residents: Opportunities for Increasing Participation in Multifamily Energy Efficiency Programs. Retrieved from http://aceee.org/research-report/u1603
[31] Ibid
[32] Ibid
[33] Ibid
[34] Ibid
[35] Ross, L., Jarrett, M., & York, D. (2016). Reaching More Residents: Opportunities for Increasing Participation in Multifamily Energy Efficiency Programs. Retrieved from http://aceee.org/research-report/u1603

Indiana Power and Light (IPL) networks with the Indianapolis Apartment Association and builds relationships with regional managers and property owners in addition to individual property managers.

Considerations

- Ameren Illinois should continue to *build* on efforts to market the Multifamily Program through housing trade associations by advertising in publications developed by these associations. Ameren Illinois could increase program reach by partnering with new organizations that have access to a wide variety of properties, such as regional housing companies and financial institutions.
  - When the program begins offering a low income component in PY10, Ameren Illinois and its customers may benefit from the utility reaching out to partner with agencies that serve low income customers such as affordable housing groups and CDFIs. Ameren Illinois can work with these organizations to market the program to low income customers and potentially leverage funds from these organizations for multifamily upgrades to expand savings and provide social benefits.

Effectively communicate the benefits of energy efficiency upgrades to property managers and owners.

The central goal of any program outreach and recruitment effort is to convey the program's value proposition and entice interested customers in making efficient upgrades through the program. Comprehensive communications strategies will cover both energy benefits and non-energy benefits (see sidebar), and offer both pre-participation and post-participation contacts to nurture the client relationship to ensure sustained energy savings and customer satisfaction.

For example, program marketing materials are designed to clearly communicate the value of participating in a program and to provide instructions about how to participate in it. Including a discussion of non-energy benefits can enhance the "value proposition" messaging.[36]

Revisiting property managers *after* upgrades have been installed can reinforce participants' understanding of the savings associated with their upgrades and motivate them to install more upgrades in the future.[37] This can be done by providing managers with their building energy use data. Building energy use benchmarking requirements are expected to become more common in the future, and giving property managers access to their data can help prepare them for benchmarking their buildings. In terms of follow-up check-ins to market additional upgrades to property managers, follow-ups could be completed either as part of the QA/QC process or other, more

Non-Energy Benefits of Multifamily Programs

The benefits that programs can market to property managers and owners include reduced building maintenance costs, increased tenant comfort, reduced water usage, improved indoor air quality, improved fire safety, reduced tenant turnover, lower unit vacancy costs, and greater temperature control. Energy efficiency upgrades can also help make multifamily buildings more marketable and attract tenants. Furthermore, completing energy efficient upgrades can help prepare property managers for future code changes.

[36] Ibid

[37] McKibbin, A. (2013). Engaging as Partners in Energy Efficiency: A Primer for Utilities on the Energy Efficiency Needs of Multifamily Buildings and Their Owners. Retrieved from http://www.elevateenergy.org/wp/wp-content/uploads/2014/01/Engaging_as_Partners_in_Energy_Efficiency_Primer_for_Utilities_on_the_Energy_Efficiency_Needs_of_Multifamily_Buildings.pdf

informal, follow-ups. Mckibbin (2013) suggests doing a follow-up up to one or two years after the upgrades have been completed.[38]

In line with this guidance, Ameren Illinois currently highlights several non-energy benefits in the brochures used to market the Multifamily Program to property managers. These benefits include lower operating costs, improved property value, increased comfort for tenants, and improved tenant retention. Additionally, Ameren Illinois, along with other utilities, recently joined an initiative led by the Department of Energy to facilitate sharing aggregated energy usage data with customers. This effort, called the Green Button Initiative, is designed to help share energy usage data with customers after upgrades have been completed.[39] Ameren Illinois currently does not share this information with properties that have completed program upgrades. Overall, while Ameren Illinois is currently taking several steps to communicate the benefits of energy upgrades with their multifamily customers, we identified opportunities for Ameren Illinois to further improve their communications:

Considerations

- Consider instituting a formalized process to follow up with multifamily customers about their energy usage after upgrades have been installed. Program administrators could use efforts like the Green Button Initiative to share aggregated energy usage data with customers.
- Program administrators should ensure that they advertise the full suite of non-energy benefits associated with installing energy efficient upgrades when they market the program to customers. The program should consider highlighting additional non-energy benefits in program marketing materials. These benefits include reduced water usage, improved indoor air quality, improved fire safety, greater temperature control, and proactive preparation for future code changes.

Standardize data tracking and reporting methods over the program lifespan and track participation data by market segment

Ross et al. (2016) reported that many utilities do not know the total number of multifamily units that are eligible for energy efficient upgrades in their service territories and that this is especially true for affordable housing units.[40] Furthermore, Ross et al. (2016) found that when program administrators need to turn customers away because they exhaust the measure offerings and budget for the program year, they rarely keep a waiting list for customers.[41]

A best practice for handling these situations is for program administrators to keep a waiting list of customers that enables them to re-contact interested parties in future program years. Some programs track participation by-unit for their direct install measures but by-project for their comprehensive measures. These tracking and reporting differences within programs make it difficult to make comparisons of participation data across programs. ACEEE suggests that program administrators should follow standard reporting procedures for all elements of their program, as well as over time (to the extent practicable) to allow for easy year-over-year comparisons as well as comparisons between programs.

[38] McKibbin, A. (2013). Engaging as Partners in Energy Efficiency: A Primer for Utilities on the Energy Efficiency Needs of Multifamily Buildings and Their Owners. Retrieved from http://www.elevateenergy.org/wp/wp-content/uploads/2014/01/Engaging_as_Partners_in_Energy_Efficiency_Primer_for_Utilities_on_the_Energy_Efficiency_Needs_of_Multifamily_Buildings.pdf
[39] Ibid
[40] Ross, L., Jarrett, M., & York, D. (2016). Reaching More Residents: Opportunities for Increasing Participation in Multifamily Energy Efficiency Programs. Retrieved from http://aceee.org/research-report/u1603
[41] Ibid

Considerations

- Ameren Illinois reported needing to turn away customers from the AIC major measures component in PY9. If this happens again in the future, program administrators may want to keep a list of contact information for customers they turn away due to funding shortages.

Identify opportunities for aligning energy efficiency upgrades with larger building renovation projects

Comprehensive energy efficiency upgrades, such as upgrades to building shell measures, can be an inconvenience to tenants; additionally, deeper upgrades often require project financing.[42] As such, major energy-efficiency upgrades can be made more palatable to property managers and owners if the timeline can be adapted to coincide with other planned major building upgrades. Furthermore, reaching out to property managers during building renovation periods is especially important for affordable multifamily housing complexes because the financing available for these complexes often runs on strict timelines. For example, owners of multifamily complexes built using the Low Income Housing Tax Credit must wait for a period of 15 years after construction or renovation before they can change the financing structure of the project, which poses challenges to for securing capital to make energy efficient upgrades.[43]

Considerations

- Program administrators may benefit from maintaining ongoing contact with property managers to stay up to date about when properties are scheduled for major renovations. Keeping an updated pipeline of potential participants could also help the program identify additional opportunities for major measures upgrades.

Best Practices to Consider

The ACEEE best practice reports offered several additional recommendations that, although more extensive, are items that Ameren Illinois may be able to consider as part of a broader program redesign or modification. Because these recommendations are not immediately transferrable to the program as-implemented in PY9, we convey these best practices as information to consider for the future.

Offer an energy audit paired with upgrades that are customized to the participant

Several program administrators including Puget Sound Energy and Energy Trust of Oregon offer a customized approach to their multifamily customers. These programs offer energy audits as well as incentives to complete measure upgrades suggested during the audit.[44] In addition, the California IOUs are testing Energy Upgrade

[42] Ross, L., Jarrett, M., & York, D. (2016). Reaching More Residents: Opportunities for Increasing Participation in Multifamily Energy Efficiency Programs. Retrieved from http://aceee.org/research-report/u1603

[43] McKibbin, A. (2013). Engaging as Partners in Energy Efficiency: A Primer for Utilities on the Energy Efficiency Needs of Multifamily Buildings and Their Owners. Retrieved from http://www.elevateenergy.org/wp/wp-content/uploads/2014/01/Engaging_as_Partners_in_Energy_Efficiency_Primer_for_Utilities_on_the_Energy_Efficiency_Needs_of_Multifamily_Buildings.pdf

[44] ACEEE. (2014). Recommendations and Best Practices for Revising Incentive Structure. Retrieved from http://aceee.org/sites/default/files/pdf/revising-incentive-structure.pdf

California pilots that provide custom comprehensive upgrades for multifamily buildings.[45] In those pilots, the customer is allowed to request incentives for any property upgrade that they install as part of a pre-approved package of upgrades that meets at least 10% building energy savings overall. Energy audits work well in combination with custom program approaches as they help deliver upgrades that are targeted to the customer. In addition, energy audits can be used as a tool to encourage customers to complete more extensive energy efficient upgrades as they can provide suggestions for low- and no-cost upgrades, while also providing customers with recommendations for deeper retrofits.[46]

Considerations

- Ameren Illinois could consider using part of this best practice within the current design. Specifically, offering energy audits to customers before performing upgrades could help increase customer knowledge about energy efficient upgrades and provide a channel to getting the customer to complete more work down the line, on their own.

Develop program offerings for both market rate and low income buildings

Programs serving low-income multifamily residents should offer specific measures and technical assistance that meet unique needs of low-income customers.[47] Efficiency Vermont offers measures that specifically cater to low-income residents in addition to offerings for customers in market rate housing.[48] Efficiency Vermont's measure offerings targeted at low income customers include weatherization measures and deep retrofits. Furthermore, low income properties often have more opportunities to access financing for energy efficiency upgrades; program administrators can provide support to low income property managers by helping them identify and navigate these sources of funding.[49]

The Ameren Illinois Multifamily Program will begin serving low-income customers in PY10, so has not yet needed to make use of this guidance. For more detailed guidance about designing programs to serve low income multifamily customers please see Opinion Dynamics' 2017 Literature Review of Low-Income Programs prepared for AIC.[50]

Considerations

- As Ameren Illinois begins serving income-qualified properties, they may find it helpful to do some preliminary customer research with property owners in the area to learn their needs and constraints so that program design effectively provides the most-valued savings opportunities to this new sector. Ameren Illinois may also want to use its existing connections with landlord groups as an informal market research opportunity.

[45] Opinion Dynamics. (2014). SCE/SoCalGas Energy Upgrade California Multifamily Pilot Evaluation. Retrieved from http://www.calmac.org/publications/SCE_SoCalGas_EUC_MF_Pilot_Final_Report_2017-05-16.pdf
[46] Johnson, K. (2013). Apartment Hunters: Programs Searching for Energy Savings in Multifamily Buildings. Retrieved from http://aceee.org/research-report/e13n
[47] Ibid
[48] Johnson, K. (2013). Apartment Hunters: Programs Searching for Energy Savings in Multifamily Buildings. Retrieved from http://aceee.org/research-report/e13n
[49] Ibid
[50] Opinion Dynamics. (2017). Literature Review of Low-Income Programs. Memorandum delivered to AIC and ICC staff on August 25, 2017.

Expand offerings for comprehensive upgrades through escalating incentives and offering financing options

Several reports suggested offering retrofits that are more extensive, in that they require more time, expertise, and cost to complete, while providing higher savings per building.[51] These extensive retrofits include HVAC measures, whole building and building shell measures, and replacing outdated building systems.[52] Such retrofits are especially common among more mature programs that have been offering incentives for 20+ years.[53] The Ameren Illinois Multifamily Program already offers air sealing and insulation through the major measures component of the Multifamily Program. If Ameren Illinois is interested in expanding the major measures component of the Multifamily Program, the added cost may be a concern given that the program is currently designed to offer 100% rebates on major measures.

There are several options for financing these retrofits so that cost may be shared with the customer. First, programs can offer escalating incentives that vary with the savings potential of the retrofit.[54] To some extent, the Ameren Illinois Program already follows this method, offering rebates on the basis of measure quantity and efficiency level. Second, programs can assist customers with finding financing options for deeper retrofits. Providing customers with on-bill or low-cost financing can help customers take on more extensive upgrades and spread payments over the lifetime of the project than they would be able to do with conventional financing.[55]

Considerations

- Ameren Illinois could consider offering financing for major measures as a pathway to increasing the number of customers the program is able to serve each year, or as a way to offer add-on major measures through the program such as HVAC measures, energy management systems, or custom upgrades. Although Ameren Illinois stopped offering incentives for some of these measures in previous program years, there may be opportunities to leverage other Ameren Illinois programs, such as the HVAC Program, to revisit the potential of offering these measures in a more cost-effective manner than was previously possible.

- If Ameren Illinois brings back larger replace-on-failure measures (e.g., HVAC systems) to find additional savings, consider building some temporal flexibility into the offering. Early program experience showed that property managers were not ready to replace their HVAC systems when they first learned of the Multifamily Program, but there may be value in exploring a design that leverages the first point of contact with managers to make them aware of a stand-alone efficient HVAC offering that they could return to when they need to replace a failing unit.

3.2.2 Program Ally Interview Key Findings

If Ameren Illinois brings back larger replace-on-failure measures (e.g., HVAC systems) to find additional savings, consider building some temporal flexibility into the offering. Early program experience showed that

[51] ACEEE. (2014). Recommendations and Best Practices for Revising Incentive Structure. Retrieved from http://aceee.org/sites/default/files/pdf/revising-incentive-structure.pdf
[52] Johnson, K. (2013). Apartment Hunters: Programs Searching for Energy Savings in Multifamily Buildings. Retrieved from http://aceee.org/research-report/e13n
[53] Ross, L., Jarrett, M., & York, D. (2016). Reaching More Residents: Opportunities for Increasing Participation in Multifamily Energy Efficiency Programs. Retrieved from http://aceee.org/research-report/u1603
[54] Johnson, K. (2013). Apartment Hunters: Programs Searching for Energy Savings in Multifamily Buildings. Retrieved from http://aceee.org/research-report/e13n
[55] Ibid

property managers were not ready to replace their HVAC systems when they first learned of the Multifamily Program, but there may be value in exploring a design that leverages the first point of contact with managers to make them aware of a stand-alone efficient HVAC offering that they could return to when they need to replace a failing unit.

Multifamily Program allies play an important role in marketing and implementing the Ameren Illinois Multifamily Program's major measure offerings including air sealing and insulation. Furthermore, program allies offer a key perspective on the multifamily property market. Program ally firms fell into two sets—"active" allies and "less-active" allies—based on their self-reported descriptions about their relative involvement in, and dependence on, the Multifamily Program to generate business. In comparison to less active allies, active allies reported the program had a larger influence on their business practices as their multifamily work in the Ameren Illinois service territory increased greatly after they enrolled in the program. All program allies enrolled in the program have businesses that primarily offer building shell and HVAC upgrades to their customers.

Our July 2017 interviews with five program allies investigated program allies' success in bringing projects into the program, program ally satisfaction, any impacts of program participation on program ally business and practices, and program allies' suggestions for program improvement. We also asked program allies to think back over their tenure within the program to reflect on their experiences. The team used information from these interviews to understand energy efficient product saturation in the multifamily market from the program allies' perspective and to learn how program changes over time may have affected allies. Overall, program allies were highly satisfied with the PY9 Ameren Illinois Multifamily Program. On a scale of 0 (not at all satisfied) to 10 (extremely satisfied), program allies provided an average rating of 8.6, with the lowest rating being a 7 (n=5). Furthermore, all program allies reported the percentage of multifamily upgrade situations in which they complete air sealing and install high-efficiency insulation increased greatly after they began participating in the Multifamily Program. Furthermore, all allies reported the total volume of air sealing and high efficiency insulation projects they completed in AIC service territory also increased greatly after they joined the program.

Program allies reported they face challenges finding cost-effective savings opportunities as many of the easier-to-serve properties have already received upgrades through the program. Program allies also cited program disruptions as a barrier to delivering the program. Program allies offered several suggestions for overcoming the current challenges they face with implementing the program. To address market saturation, program allies identified low-income multifamily buildings, small towns, smaller complexes, and gas customers as market segments that still offer savings opportunities. Program allies noted that to capitalize on opportunities for achieving additional savings in multifamily buildings, program guidelines for qualifying air sealing and insulation projects would need to change, and/or the program would need to add additional measures. Additional measure suggestions included air source heat pumps, crawl space insulation, fans and air circulation measures, attic insulation with higher R-values, and insulating around "knob and tube" wires.

We delivered a stand-alone findings memo providing full details of these findings to AIC in August 2017; for convenience, a copy of this memo is presented in Appendix F.

3.3 Impact Assessment

To estimate ex post gross savings for the AIC program[56], the evaluation team applied in-service rates (ISRs) and savings algorithms from the IL-TRM V5.0 using program-tracking database inputs. The evaluation team applied the SAG-approved NTGRs to ex post gross savings to determine ex post net impacts.

3.3.1 Measure Verification

The program offers a variety of measures to participants, including interior in-unit and common area lighting measures, in-unit water-savings measures and programmable thermostats, and major measures (air sealing and attic insulation). To determine the verified measure quantities, the evaluation team applied ISRs provided in the IL-TRM V5.0 to ex ante measure quantities. Table 14 provides the ISRs for each measure.

[56] In reference to impact evaluation research, "AIC Program" and "The Program" refers exclusively to the AIC Multifamily Program

Table 14. PY9 AIC Multifamily Program Verified Measure Quantities

Measure	Unit	Ex Ante Measure Quantity	ISR	Verified Measure Quantity[a]
Air Sealing – With Gas Heat	CFM	1,080,749	100%	1,080,749
Attic Insulation (R11 to R49) - With Gas Heat	Sq.Ft.	629,034	100%	629,034
CFL – Low In-Unit	Bulb	30,347	97%	29,406
14W Globe - In-Unit	Bulb	11,549	97%	11,191
CFL – Medium In-Unit	Bulb	7,258	97%	7,033
9W Candelabra In-Unit	Bulb	4,523	97%	4,383
Aerator (Electric Water Heater) - 1.5 GPM	Aerator	3,406	95%	3,236
Showerhead (Electric Water Heater) - 1.75 GPM	Shower Head	2,976	95%	2,827
Aerator (Electric Water Heater) - 2.0 GPM	Aerator	2,442	91%	2,222
9W LED In-Unit	Bulb	2,026	95%	1,925
15W Reflector In-Unit	Bulb	1,959	97%	1,898
Showerhead (Gas Water Heater) - 1.75 GPM	Shower Head	1,741	95%	1,654
Aerator (Gas Water Heater) - 2.0 GPM	Aerator	1,694	91%	1,542
Aerator (Gas Water Heater) - 1.5 GPM	Aerator	1,665	95%	1,582
CFL – High In-Unit	Bulb	1,375	97%	1,332
Thermostat – With Electric Resistance Heat	Thermostat	1,132	100%	1,132
Thermostat – With Gas Heat	Thermostat	966	100%	966
13W Interior - Common Area Lighting	Bulb	615	98%	603
9W Candelabra - Common Area Lighting	Bulb	476	98%	466
15W Reflector - Common Area Lighting	Bulb	344	98%	337
20W Interior - Common Area Lighting	Bulb	278	98%	272
23W Interior - Common Area Lighting	Bulb	196	98%	192
23W Exterior - Common Area Lighting	Bulb	182	98%	178
13W Exterior - Common Area Lighting	Bulb	97	98%	95
15W Reflector Exterior - Common Area Lighting	Bulb	95	98%	93
Thermostat – With Heat Pump Heating	Thermostat	93	100%	93
14W Globe - Common Area Lighting	Bulb	61	98%	60
20W Exterior - Common Area Lighting	Bulb	45	98%	44
9W Candelabra Exterior - Common Area Lighting	Bulb	44	98%	43
Thermostat – With Gas Heat Only	Thermostat	7	100%	7
14W Globe Exterior - Common Area Lighting	Bulb	4	98%	4
Total[b]		**1,787,379**	**100%**	**1,784,600**

[a] Verified measure quantity = ex ante quantity * ISR
[b] Numbers may not total due to rounding.

3.3.2 Ex Post Gross Impact Results

The total ex post gross impacts for the PY9 AIC Multifamily Program were 4,601 MWh, 0.82 MW, and 189,395 therms. As shown in Table 15, ex post gross impacts were higher than ex ante gross impacts, with gross realization rates of 103% for energy savings and 109% for therm savings. The program did not claim any ex ante demand savings.

Table 15. PY9 AIC Multifamily Program Gross Impacts

Program	Ex Ante Gross[a]			Ex Post Gross			Gross Realization Rate[b]		
	MWh	MW[c]	Therms	MWh	MW	Therms	MWh	MW	Therms
AIC Multifamily	4,476	n/a	174,043	4,601	0.82	189,395	103%	n/a	109%

[a] Source of ex ante savings: PY9 program-tracking database.
[b] Gross Realization Rate = ex post gross value ÷ ex ante gross value * 100.
[c] Ex ante program tracking data provided to the evaluation team did not report PY9 demand savings.

As shown in Table 16, gross electric realization rates varied by measure. Differences in ex ante and ex post gross savings, seen in Table 16, stemmed from differences in input values for the savings algorithms for six of 12 measures. In particular, differences in the inputs for air sealing, attic insulation, and common area lighting measures together increased the overall program-level realization rates for electric impacts. Air sealing and attic insulation measures had the highest gross energy realization rates of 128% and 141%, respectively, while faucet aerators had the lowest realization rate (90%).

Table 16. PY9 AIC Multifamily Program Gross Electric Impacts by Measure

Measure	Verified Measure Quantity	Ex Ante Gross MWh	Ex Post Gross MWh	Gross Realization Rate[a]
In-Unit CFLs – Interior	37,772	973	973	100%
Showerhead	4,481	840	840	100%
Programmable Thermostat	2,198	788	794	101%
In-Unit Specialty CFLs – Interior	17,472	595	595	100%
Air Sealing	1,080,749	284	362	128%
Faucet Aerator	8,581	374	336	90%
Common Area Standard CFLs – Interior	1,067	223	245	110%
Common Area Specialty CFLs - Interior	863	208	228	110%
Attic Insulation	629,034	90	127	141%
LED	1,925	53	53	100%
Standard CFLs - Exterior	318	32	32	100%
Specialty CFLs - Exterior	140	15	15	100%
Total	**1,784,600**	**4,476**	**4,601**	**103%**

[a] Gross Realization Rate = ex post gross value ÷ ex ante gross value.

Note: Ex ante claimed no demand savings, therefore ex post demand savings and demand realization rates are not included here.

Numbers may not total due to rounding.

Table 17 summarizes the ex post gross gas impacts by measure; all realization rates are greater than 100%. Differences in ex ante and ex post gross savings stem from the application of heating penalties to lighting measures. Specifically, ex ante therm savings calculations include heating penalties associated with lighting measures. In contrast, the evaluation team excluded heating penalties from ex post calculations per the previous agreement between ICC staff and AIC staff. Because lighting measures accounted for 92% of the total program ex ante energy savings, these differences are the primary reason that the overall gross realization rate for gas savings is 109%. It is important to note that ex ante net gas savings do not include heating penalties, a further discussion of this reporting discrepancy is available in the following section, "Ex Post Net Impacts Results".

Table 17. PY9 AIC Multifamily Program Gross Gas Impacts by Measure

Measure	Verified Measure Quantity	Ex Ante Gross Therms	Ex Post Gross Therms	Gross Realization Rate[a]
Air Sealing	1,080,749	79,837	79,841	100%
Attic Insulation	629,034	39,289	39,289	102%
Programmable Thermostat	2,198	34,042	34,997	101%
Showerhead	4,481	24,496	24,496	100%
Faucet Aerator	8,581	10,639	10,772	101%
Common Area Standard CFLs – Interior	1,067	0	0	n/a
Common Area Specialty CFLs - Interior	863	0	0	n/a
Standard CFLs - Exterior	318	0	0	n/a
Specialty CFLs - Exterior	140	0	0	n/a
LED	1,925	-38	0	n/a
In-Unit Specialty CFLs – Interior	17,472	-6,017	0	n/a
In-Unit CFLs - Interior	37,772	-8,206	0	n/a
Total	**1,784,600**	**174,043**	**189,395**	**109%**

[a] Gross Realization Rate = ex post gross value ÷ ex ante gross value * 100.
Note: Numbers may not total due to rounding.

Table 18 summarizes the sources of differences between ex ante and ex post gross savings from Table 16 and Table 17.

Table 18. Reasons for Realization Rates per Measure

Measure	Gross Realization Rate		Source of Discrepancy				
	MWh	Therms	SEER[a]	Heating Penalties	CF. WHFe, WHFd[b]	Fan Run Time Savings	Other (Specified)[c]
Attic Insulation	141%	100%	✓			✓	• Ex ante analysis applied incorrect N_Cool and N_ Heat[f] values
Air Sealing	128%	100%	✓			✓	
Common Area Standard CFLs – Interior	110%	n/a		✓	✓		
Common Area Specialty CFLs - Interior	110%	n/a		✓	✓		
Programmable Thermostat	101%	n/a					• Some projects had conflicting information in measure type and heating type[d] • Some gas measures' kWh savings incorrectly calculated from therms savings[e]
In-Unit CFLs - Interior	100%	n/a		✓			
LED	100%	n/a		✓			
Faucet Aerator	90%	101%					• Ex ante analysis uses Single Family assumptions from the IL-TRM V5.0, whereas ex post uses Multi Family assumptions

[a] SEER = Seasonal Energy Efficiency Ratio.
[b] CF = Coincidence Factor and WHFe = Waste Heat Energy Factor, and WHFd = Waste Heat Demand Factor
[c] Describes incorrect ex ante assumptions and calculation methods.
[d] For a handful of programmable thermostat measures a gas heating type but electric thermostat are associated with the same project (and vice versa: electric heating type but gas thermostat).
[e] More specifically ex ante omitted the conversion from therms to kWh and the application of furnace fan energy consumption factor
[f] N_Cool /N_Heat = conversion factor from leakage at 50 Pascal to leakage at natural conditions.

Through our discussions with the implementer, we identified the sources of the differences between ex ante and ex post savings. In some cases, these differences meant that ex ante savings are higher than ex post savings, while, in other cases, they meant that ex ante savings are lower than ex post savings. The combination of all inputs brings about the overall realization rate for each measure. We describe the differences in ex ante and ex post savings calculations in detail below.

- **Air Sealing and Attic Insulation Discrepancies:**
  - **Fan Runtime Savings:** The implementer did not include fan runtime savings in ex ante savings calculations for air sealing and attic insulation upgrades, although these savings are relevant for projects with gas furnaces. For the ex post analysis, the evaluation team included fan runtime savings per the IL-TRM V5.0. As a result, ex post electric savings are higher than ex ante estimates.

- **SEER Values:** Ex ante and ex post analyses are largely aligned, as both largely followed the IL-TRM V5.0 approach and assigned cooling efficiencies by project, based on the age of the property's cooling equipment. However, ex ante and ex post methods differed in terms of how to assign SEER for equipment that was missing an age. Specifically, for projects with unknown cooling equipment age, the implementer applied a weighted average cooling efficiency of 11.05 SEER based on an assumed mix of cooling equipment ages, while the evaluation team applied an average of 10.06 SEER, derived as an average from participants with cooling equipment age (n=252).

- **N_ Cool and N_Heat (Air Sealing):** The IL-TRM V5.0 recommends N_Cool and N_Heat values based on project location. For six projects, the evaluation team found that the implementer assigned N_Cool and N_Heat values for Springfield, IL, whereas program-tracking data indicated that projects were closer to cities other than Springfield. In ex post calculations, we applied IL-TRM V5.0 values for the city closest to the project location. Based on actual project locations, ex post savings for these six projects are higher than ex ante savings.

- **Lighting Discrepancies:**

  - **WHFe (Common Area Lighting)**: Ex ante savings for common area lighting measures were calculated using WHFe assumptions for multifamily in-unit CFL installations. Since lighting installed in common areas typically reflects commercial usage patterns, the evaluation team applied IL-TRM V5.0 commercial assumptions for CFLs installed in multifamily buildings. Compared to ex ante assumptions, WHFe increased from 1.04 to 1.14. Overall, this difference resulted in an increase in ex post energy savings.

  - **Heating Penalties**: Ex ante gross analysis included the waste heat factor heating penalty for all in-unit CFLs and in-unit LEDs lighting measures. However, consistent with past evaluations, and per agreements between ICC staff and AIC staff regarding the treatment of heating penalties, we did not include heating penalties for lighting in the ex post gross savings calculations. This resulted in an increase in ex post gas savings.

- **Programmable Thermostat Discrepancies:**

  - **Incorrect Savings Algorithm:** Ex ante energy savings calculations for five projects either incorrectly excluded fan runtime savings from the energy savings algorithm or applied an incorrect heating type assumption. Ex post savings calculations are based on the correct algorithm and assumptions, which increased the overall energy savings relative to ex ante calculations.

- **Faucet Aerator Discrepancies:**

  - **Single Family Assumptions:** For ex ante savings inputs dependent on home type, the implementer used the single family assumptions from the IL-TRM V5.0, rather than multifamily assumptions. For instance, the household factor decreased from 2.56 (single family) to 2.1 (multifamily). Ex post savings from multifamily assumptions are smaller than the ex ante savings derived from single family assumptions.

3.3.3 Ex Post Net Impacts Results

The evaluation team calculated PY9 ex post net impacts by applying SAG-approved NTGRs to ex post gross savings (Table 19). AIC Multifamily Program implementers calculated net impacts the same way, except for lighting measures. For lighting measures, the program implementer included heating penalties in ex ante gross therm savings (Table 17), where the evaluation team did not. Rather than correct for the heating penalties at

the gross savings level, the implementation team removed negative therm values at the net therm savings level only. For this reason, the gross therm savings realization rate is higher than the net therm realization rate reported below in Table 19.

Table 19. PY9 AIC Multifamily Program Net Impacts

Program	Ex Ante Net			Ex Post Net		
	MWh	MW	Therms	MWh	MW	Therms
Multifamily Program	4,344	n/a[a]	161,161	4,444	0.79	162,233
Net Realization Rate[b]				**102%**	**n/a**	**101%**

[a] Program did not report ex ante demand savings.
[b] Net Realization Rate = ex post net value ÷ ex ante net value * 100.

4. Key Findings and Recommendations

- **Key Finding #1:** It is important to ensure that the program-tracking platform accurately calculates and claims savings that are representative of actual installation parameters and which reflect the most appropriate assumptions from the IL-TRM V5.0. More specifically, common area lighting measures should reference the commercial and industrial IL-TRM V5.0 while all remaining measures should apply residential multifamily assumptions from the IL-TRM V5.0, By doing a complete QA/QC review of all measures, the implementers can minimize data entry errors, however small, and ensure that all algorithms and the assumptions programmed in the program-tracking database reflect best practice.
  - **Recommendation #1:** It is important to ensure that the program-tracking platform accurately calculates and claims savings that are representative of actual installation parameters and which reflect the most appropriate assumptions from the IL-TRM V5.0. By doing a complete QA/QC review of all measures, the implementers can minimize data entry errors, however small, and ensure that all algorithms and the assumptions programmed in the program-tracking database reflect best practice.
- **Key Finding #2:** The Ameren Illinois Multifamily Program relies on program allies to deliver its major measures program offering—following a program best practice identified in the program benchmarking exercise. Still, some program allies noted that they are facing some business challenges in serving the program as they attempt to adapt to midyear program funding disruptions (PY9 and in past years) and an increasingly-saturated marketplace.
  - **Recommendation #2:** As the Ameren Illinois Multifamily Program is expected to undergo changes in design and funding in PY10, Ameren Illinois program administrators should work closely with program allies and program implementers in the transition period (if possible) and early in PY2018 to help the program allies and implementers plan for and navigate changes. Clear and timely communication is an opportunity to enable the allies to plan for any adaptations needed so that they can deliver the program effectively and efficiently, to maintain allies' overall trust in the program as a dependable part of their business, and to ensure that program changes are seamless from the customer's perspective.
- **Key Finding #3:** Most program allies feel that they have already worked through many of the easier-to-serve properties. As a result, they view the remaining buildings as being more scattered throughout the territory and less cost-effective to serve. The program benchmarking process identified practices for addressing saturated markets including expanding offerings for comprehensive upgrades and promoting them through escalating incentives and financing options.
  - **Recommendation #3:** Consider expanding program offerings or guidelines to open up new cost-effective savings opportunities for program allies. Also consider whether new incentive structures could help balance the program's budgetary constraints with the need to continue addressing property owners' split incentives.
- **Key Finding #4:** Engaging with organizations that are also involved in multifamily energy efficiency is a best practice for ratepayer-funded programs seeking to expand their reach. AIC staff continue to attend annual landlord association meetings in the Peoria, IL area and have identified leads from these venues. In addition, program allies have had success marketing the program by actively recruiting property managers at rental property professional association meetings. In addition, the benchmarking review process identified several opportunities for Ameren Illinois to expand these types of partner outreach efforts to achieve increased savings.

- **Recommendation #4:** Ameren Illinois should continue to build on efforts to market the Multifamily Program via existing networks of multifamily organizations. Potential opportunities to consider include placing advertisements in housing trade association publications or developing new partnerships with organizations that can provide Ameren Illinois with a single point of access to a wide variety and number of properties, such as regional housing companies and financial institutions.

Appendix A. Data Collection Instruments

PY9 Ameren Illinois MF Program Ally IDI

PY9 Ameren Illinois MF Staff Guide.pdf

Appendix B. Engineering Analysis Algorithms

In PY9, the impact evaluation efforts estimated gross impact savings for the AIC Multifamily Program by applying savings algorithms from the IL-TRM V5.0 to the information in the program-tracking database.

We present the algorithms and input variables used to calculate all evaluation program savings below.

In-Unit CFL Algorithms

The evaluation team determined ex post in-unit lighting savings using the algorithms below. All variable assumptions are from the IL-TRM V5.0.

Equation 1. In-Unit Standard and Specialty CFL Algorithms

Energy Savings: $\Delta kWh = ((WattsBase - WattsEE) / 1{,}000) * Hours * WHF_e$

Demand Savings: $\Delta kW = ((WattsBase - WattsEE) / 1{,}000) * WHF_d * CF$

Where:

Table 20. Measure Specific Inputs for In-Unit Lighting Measures

Measure Name	WattsBase	WattsEE	CF	Hours	Resource
14W Globe In-Unit	60	14	0.075	639	IL-TRM V5.0
15W Reflector In-Unit	65	15	0.091	861	
9W Candelabra In-Unit	40	9	0.121	1,190	
CFL High	72	23	0.074	793	
CFL Low	43	13	0.074	793	
CFL Medium	53	20	0.074	793	

WattsBase = Wattage of existing equipment (see Table 20)

WattsEE = Wattage of installed CFL (see Table 20)

Hours = Annual operating hours (see Table 20)

WHF_e = Waste heat factor for energy (accounts for cooling savings from efficient lighting) = 1.04

WHF_d = Waste heat factor for demand (accounts for cooling savings from efficient lighting) = 1.07

CF = Summer Peak Coincidence Factor (see Table 20)

Interior Common Area CFL Algorithms

The evaluation team determined ex post in-unit lighting savings using the algorithms below. All variable assumptions are from the IL-TRM V5.0.

Equation 2. Interior Standard and Specialty CFL Algorithms

Energy Savings: $\Delta kWh = ((WattsBase - WattsEE) / 1{,}000) * Hours * WHF_e$

Demand Savings: $\Delta kW = ((WattsBase - WattsEE) / 1{,}000) * WHF_d * CF$

Where:

Table 21. Baseline and Efficient Wattages for Interior Common Area Lighting Measures

Measure Name	WattsBase	WattsEE	Resource
13W Interior CAL	43	13	IL-TRM V5.0
14W Globe CAL	60	14	
15W Reflector CAL	65	15	
20W Interior CAL	53	20	
23W Interior CAL	72	23	
9W Candelabra CAL	40	9	

WattsBase = Wattage of existing equipment (see Table 21)

WattsEE = Wattage of installed CFL (see Table 21)

Hours = Annual operating hours = 5,950

WHF_e = Waste heat factor for energy (accounts for cooling savings from efficient lighting) = 1.14

WHF_d = Waste heat factor for demand (accounts for cooling savings from efficient lighting) = 1.32

CF = Summer Peak Coincidence Factor = 0.64

Exterior Common Area CFL Algorithms

The evaluation team determined ex post in-unit lighting savings using the algorithms below. All variable assumptions are from the IL-TRM V5.0.

Equation 3. Exterior Standard and Specialty CFL Algorithms

Energy Savings: $\Delta kWh = ((WattsBase - WattsEE) / 1{,}000) * ISR * Hours * WHF_e$

Demand Savings: $\Delta kW = ((WattsBase - WattsEE) / 1{,}000) * ISR * WHF_d * CF$

Where:

Table 22. Baseline and Efficient Wattages for Exterior Common Area Lighting Measures

Measure Name	WattsBase	WattsEE	Resource
14W Globe Exterior CAL	60	14	IL-TRM V5.0
15W Reflector Exterior CAL	65	15	
9W Candelabra Exterior CAL	40	9	
13W Exterior CAL	43	13	

Measure Name	WattsBase	WattsEE	Resource
20W Exterior CAL	53	20	
MF_23W Exterior CAL	72	23	

WattsBase = Wattage of existing equipment (see Table 21)

WattsEE = Wattage of installed CFL (see Table 21)

ISR = In-service rate of installed CFLs= 96.9%

Hours = Annual operating hours = 2,475

WHF_e = Waste heat factor for energy (accounts for cooling savings from efficient lighting) = 1

WHF_d = Waste heat factor for demand (accounts for cooling savings from efficient lighting) = 1

CF = Summer Peak Coincidence Factor = 0

In-Unit LED Algorithms

The evaluation team determined ex post in-unit LED lighting savings using the algorithms below. All variable assumptions are from the IL-TRM V5.0.

Equation 4. In-Unit Standard and Specialty CFL Algorithms

Energy Savings: $\Delta kWh = ((WattsBase - WattsEE) / 1{,}000) * Hours * WHF_e$

Demand Savings: $\Delta kW = ((WattsBase - WattsEE) / 1{,}000) * WHF_d * CF$

Where:

WattsBase = Wattage of existing equipment = 43 Watts[57]

WattsEE = Wattage of installed LED = 9 Watts

Hours = Annual operating hours = 759

WHF_e = Waste heat factor for energy (accounts for cooling savings from efficient lighting) = 1.04

WHF_d = Waste heat factor for demand (accounts for cooling savings from efficient lighting) = 1.07

CF = Summer Peak Coincidence Factor = 0.071

[57] Based on the EISA adjusted baseline wattage in the IL TRM V5.0 Section 5.5.8 for the 9 Watt LED lumen range.

Lighting Measures Heating Penalty

The evaluation team determined heating penalties using the algorithms below. Based on the agreement between the ICC and AIC, we did not include heating penalties in the ex post energy savings, but will include this in the data for the PY9 cost-effectiveness analysis.

In-Unit Heating Penalties

The evaluation team determined heating penalties for in-unit lighting installations by heating equipment type, using the algorithms below. For measures where the heating fuel type is unknown, the IL-TRM V5.0 assumes gas heating.

Equation 5. Heating Penalty Algorithms for In-Unit Lighting

Electric Heating Penalty: $\Delta kWh = -(((WattsBase - WattsEE) / 1{,}000) * Hours * HF) / \eta Heat$

Gas Heating Penalty: $\Delta therms = -(((WattsBase - WattsEE) / 1{,}000) * Hours * HF * 0.03412) / \eta Heat$

Where:

WattsBase = Wattage of existing equipment (see Table 20)

WattsEE = Wattage of installed equipment (see Table 20)

Hours = Annual operating hours (see Table 20)

HF = Heating factor = 0.49

ηHeat = Efficiency of heating equipment (see Table 23).

Table 23. ηHeat for Lighting Heating Penalties

Heating Fuel Type	ηHeat	Units
Electric Resistance	1.00	Coefficient of Performance (COP)
Gas Heating	0.70	Annual Fuel Utilization Efficiency (AFUE)
Heat Pump	2.22	Coefficient of Performance (COP)
Unknown	0.70	Annual Fuel Utilization Efficiency (AFUE)

Table 24 summarizes the per-measure heating penalties for the six lighting measures installed in multifamily units offered through the program by heating equipment type.

Table 24. Per-Measure Heating Fuel Penalties for In-Unit CFL Lighting

Heating Equipment	Measure	ΔkWh	Δtherms
Electric Resistance	CFL - High	-19	n/a
	CFL - Low	-12	n/a
	CFL - Medium	-13	n/a
	14W Globe In-Unit	-14	n/a
	15W Reflector In-Unit	-21	n/a
	9W LED In-Unit	-12	n/a
	9W Candelabra In-Unit	-18	n/a
Gas Heating	CFL - High	n/a	-0.47

Heating Equipment	Measure	ΔkWh	Δtherms
	CFL - Low	n/a	-0.19
	CFL - Medium	n/a	-0.27
	14W Globe In-Unit	n/a	-0.39
	15W Reflector In-Unit	n/a	-0.32
	9W LED In-Unit	n/a	-0.01
	9W Candelabra In-Unit	n/a	-0.29
Heat Pump	CFL - High	n/a	n/a
	CFL - Low	-5	n/a
	CFL - Medium	-6	n/a
	14W Globe In-Unit	-6	n/a
	15W Reflector In-Unit	-10	n/a
	9W LED In-Unit	n/a	n/a
	9W Candelabra In-Unit	-8	n/a

Common Area Lighting Heating Penalties

The evaluation team determined heating penalties for lighting installed in common areas using the algorithms below from the IL TRM V5.0. All values are from the TRM unless otherwise noted.

Equation 6. Heating Penalty Algorithms for Common Area Lighting

Electric Heating Penalty: $\Delta kWh = -(((WattsBase - WattsEE) / 1{,}000) * Hours * IFkWh$

Gas Heating Penalty: $\Delta therms = -(((WattsBase - WattsEE) / 1{,}000) * Hours * IFTherms$

Where:

WattsBase = Wattage of existing equipment (Table 20)

WattsEE = Wattage of installed equipment (actual wattage used)

Hours = Annual operating hours = 5,950

IFTherms = Lighting-HVAC Integration Factor for gas heating impacts; this factor represents the increased gas space heating requirements due to the reduction of waste heat rejected by the efficient lighting = 0.025[58]

IFkWh = Lighting-HVAC Integration Factor for electric heating impacts; this factor represents the increased electric space heating requirements due to the reduction of waste heat rejected by the efficient lighting = 0.596 (Electric Resistance) and 0.259 (Heat Pump)[19]

[58] Based on IL TRM V5.0 Vol 2. Table in section 4.5 for Multifamily.

Table 25 summarizes the per-measure heating penalties for the lighting measures installed in common areas offered through the program.

Table 25. Per-Measure Heating Fuel Penalties for Common Area (Interior) CFL Lighting

Heating Equipment	Measure	ΔkWh	ΔTherms
Electric Resistance	13W Interior CAL	-106	n/a
	20W Interior CAL	-117	n/a
	23W Interior CAL	-174	n/a
	14W Globe CAL	-163	n/a
	15W Reflector CAL	-177	n/a
	9W Candelabra CAL	-110	n/a
Gas Heating	13W Interior CAL	n/a	-3.89
	20W Interior CAL	n/a	-5.55
	23W Interior CAL	n/a	-7.81
	14W Globe CAL	n/a	-7.05
	15W Reflector CAL	n/a	-6.18
	9W Candelabra CAL	n/a	-0.94
Heat Pump	13W Interior CAL	-46	n/a
	20W Interior CAL	n/a	n/a
	23W Interior CAL	n/a	n/a
	14W Globe CAL	-71	n/a
	15W Reflector CAL	-77	n/a
	9W Candelabra CAL	-48	n/a

Water Heating Conservation Measure Algorithms

The evaluation team determined ex post water heating conservation measure savings using the algorithms below. All variable assumptions are from the IL-TRM V5.0 unless otherwise referenced.

Equation 7. Low-Flow Shower Head Algorithms

Energy Savings: $\Delta kWh = \%ElectricDHW * ((GPM\_base * L\_base - GPM\_low * L\_low) * Household * SPCD * 365.25 / SPH) * EPG\_electric$

$Demand\ Savings: \Delta kW = \Delta kWh / Hours * CF$

Therm Savings: $\Delta Therms = \%FossilDHW * ((GPM\_base * L\_base - GPM\_low * L\_low) * Household * SPCD * 365.25 / SPH) * EPG\_gas$

Equation 8. Low-Flow Faucet Aerator Algorithms

Energy Savings: $\Delta kWh = \%ElectricDHW * ((GPM\_base * L\_base - GPM\_low * L\_low) * Household * 365.25 * DF / FPH) * EPG\_electric$

$Demand\ Savings: \Delta kW = \Delta kWh / Hours * CF$

Therm Savings: $\Delta Therms = \%FossilDHW * ((GPM\_base * L\_base - GPM\_low * L\_low) * Household * 365.25 * DF / FPH) * EPG\_gas$

Where:

%ElectricDHW = 100% if electric water heater, 0% if gas water heater

%GasDHW = 100% if gas water heater, 0% if electric water heater

GPM_base = Flow rate of the baseline shower head or faucet aerator (Table 26)

GPM_low = As-used flow rate of the low-flow shower head or faucet aerator (Table 26)

Table 26. GPM for Water Heating Measures

Measure	GPM_base	GPM_low
Faucet Aerator (1.5 GPM)	1.39	0.94
Faucet Aerator (2.0 GPM)	1.39	0.94
Shower Head	2.67	1.75

L_base = Length (in minutes) per baseline shower head or baseline faucet (Table 27)

L_low = Length (in minutes) per low-flow shower head or low-flow faucet (Table 27)

Table 27. L_base and L_low for Water Heating Measures

Measure	Minutes
Faucet Aerator (1.5 GPM)	1.6
Faucet Aerator (2.0 GPM)	4.5
Shower Head	7.8

Household = Average number of people in household for multifamily units = 2.10

SPCD = Showers per capita per day = 0.60

SPH = Shower heads per household for multifamily units = 1.30

DF = Drain factor of the low-flow shower head or faucet aerator (Table 28)

Table 28. Drain Factors for Water Heating Measures

Measure	DF
Faucet Aerator (1.5 GPM)	0.9
Faucet Aerator (2.0 GPM)	0.75
Shower Head	n/a

FPH = Faucets per household for multifamily units (Table 29)

Table 29. Faucets and Showerheads per Household for Water Heating Measures

Measure	FPH/SPH
Faucet Aerator (1.5 GPM)	1.5
Faucet Aerator (2.0 GPM)	1.0
Shower Head	n/a

EPG_electric = Energy per gallon of hot water supplied by electric water heater (Table 30)

EPG_gas = Energy per gallon of hot water supplied by gas water heater (Table 30)

Table 30. EPG for Water Heating Measures

Measure	EPG_electric	EPG_gas
Faucet Aerator (1.5 GPM)	0.0795	0.004
Faucet Aerator (2.0 GPM)	0.0969	0.0048
Shower Head	0.117	0.0058

Hours = Annual recovery hours for shower head or faucet use

Table 31. Annual Recovery Hours for Water Heating Measures

Measure	Hours
Faucet Aerator (1.5 GPM)	22
Faucet Aerator (2.0 GPM)	77
Shower Head	248

CF = Summer Peak Coincidence Factor

Table 32. Coincidence Factors for Water Heating Measures

Measure	CF
Faucet Aerator (1.5 GPM)	0.0220
Faucet Aerator (2.0 GPM)	0.0220
Shower Head	0.0278

Programmable Thermostat Algorithms

The evaluation team calculated the ex post programmable thermostat savings using the algorithms below. All variable assumptions are from the IL-TRM V5.0 unless otherwise referenced.

Equation 9. Programmable Thermostat Algorithms

Electric Energy Savings: $\Delta kWh\_heating\ (electric\ heat) = \%ElectricHeat * Elec\_Heating\_Consumption * Heating\ \_\ Reduction * HF * Eff\_ISR$

Therm Savings: $\Delta Therms = \%FossilHeat * Gas\_Heating\_Consumption * Heating\_Reduction * HF * Eff\_ISR$

Gas Energy Savings: $\Delta kWh\_heating\ (gas\ heat\ furnace\ fan\ run\ time\ reduction) = \Delta Therms * F_e * 29.3$

Total Energy Savings: $\Delta kWh\ Total = \Delta kWh\_heating\ (electric\ heat) + \Delta kWh\_heating\ (gas\ heat\ furnace\ fan\ run\ time\ reduction)$

Where:

%ElectricHeat = 100% if electric space heating fuel, 0% if gas space heating fuel

%FossilHeat = 100% if gas space heating fuel, 0% if electric space heating fuel

Elec_Heating_Consumption = Estimated annual household heating consumption for electrically heated homes (applied per participant based on project location)

Table 33. Electric Heating Consumption by Climate Zone

Climate Zone	kWh	
	Electric Resistance	Heat Pump
1 (Rockford)	21,741	12,789
2 (Chicago)	20,771	12,218
3 (Springfield)	17,789	10,464
4 (Belleville)	13,722	8,072
5 (Marion)	13,966	8,215

Gas_Heating_Consumption = Estimated annual household heating consumption for gas-heated homes (applied per participant based on project location)

Table 34. Gas Heating Consumption by Climate Zone

Climate Zone	Therms
1 (Rockford)	1,052
2 (Chicago)	1,005
3 (Springfield)	861
4 (Belleville)	664
5 (Marion)	676

Heating_Reduction = Reduction in heating energy consumption due to installing programmable thermostat = 6.2%

HF = Household factor to adjust heating consumption for multifamily homes = 65%

Eff_ISR = Percentage of thermostats installed and effectively programmed = 100% (Direct Install)[59]

F_e = Furnace fan energy consumption as a percentage of annual fuel consumption = 3.14%

Air Sealing Algorithms

The evaluation team determined ex post air sealing savings using the algorithms below. All variable assumptions are from the IL-TRM V5.0 unless otherwise referenced.

Equation 10. Air Sealing Algorithms

$$Total\ \Delta kWh = \Delta kWh\_cooling + \Delta kWh\_heating$$

$$\Delta kWh\_cooling = [(((CFM50\_existing - CFM50\_new)/N\_cool) * 60 * 24 * CDD * DUA * 0.018) / (1000 * \eta Cool)] * LM$$

$$\Delta kWh\_heating\ gas\ furnace = \Delta Therms * Fe * 29.3$$

$$\Delta kW = (\Delta kWh\_cooling / FLH\_cooling) * CF$$

[59] Based on the IL-TRM V5.0.

*ΔTherms = (((CFM50_existing - CFM50_new)/N_heat) * 60 * 24 * HDD * 0.018) / (ηHeat * 100,000)*

Where:

CFM50_existing = Infiltration at 50 Pascals as measured by blower door before air sealing

CFM50_new = Infiltration at 50 Pascals as measured by blower door after air sealing

N_Cool = Conversion factor from leakage at 50 Pascal to leakage at natural conditions (applied per participant based on location and assumption that multifamily residencies average 1.5 stories per household)

Table 35. N_Cool by Climate Zone

Climate Zone	N_Cool
1 (Rockford)	35.0
2 (Chicago)	34.4
3 (Springfield)	36.5
4 (Belleville)	35.8
5 (Marion)	38.6

N_Heat = Conversion factor from leakage at 50 Pascal to leakage at natural conditions (applied per participant based on location and assumption that multifamily residencies average 1.5 stories per household)

Table 36. N_Heat by Climate Zone

Climate Zone	N_Heat
1 (Rockford)	21.1
2 (Chicago)	21.1
3 (Springfield)	21.5
4 (Belleville)	22.5
5 (Marion)	24.6

CDD = Cooling Degree Days (applied per participant based on location)

HDD = Heating Degree Days (applied per participant based on location)

Table 37. Cooling and Heating Degree Days by Climate Zone

Climate Zone	CDD	HDD
1 (Rockford)	820	5,352
2 (Chicago)	842	5,113
3 (Springfield)	1,108	4,379
4 (Belleville)	1,570	3,378
5 (Marion)	1,370	3,438

DUA = Discretionary Use Adjustment = 0.75

ηCool = Seasonal Energy Efficiency Ratio (SEER) of Central AC (applied per participant based on existing equipment age provided in database)

Table 38. ηCool Values based on Equipment Age

Cooling Equipment Age	CAC SEER
Before 2006	10.0
During or after 2006	13.0
Unknown[a]	10.06

[a] For measures where the cooling equipment age is not provided in the database (n=252), we calculated an average cooling efficiency based on SEER values derived from measures with cooling equipment age information.

LM = Latent Multiplier to account for latent cooling demand (applied per participant based on project location)

Table 39. Latent Multiplier by Climate Zone

Climate Zone	Latent Multiplier
1 (Rockford)	3.3
2 (Chicago)	3.2
3 (Springfield)	3.7
4 (Belleville)	3.6
5 (Marion)	3.7

ηHeat = Efficiency of space heating equipment = 0.70 for gas heating

FLH_cooling = Full Load Cooling Hours (applied per participant based on project location)

Table 40. FLH_cooling by Climate Zone

Climate Zone	FLH_cooling
1 (Rockford)	467
2 (Chicago)	506
3 (Springfield)	663
4 (Belleville)	940
5 (Marion)	820

CF = Summer Peak Coincidence Factor for Central ACs = 0.68 (0.72 for Heat Pumps)

F_e = Furnace fan energy consumption as a percentage of annual fuel consumption = 3.14%

Attic Insulation Algorithms

The evaluation determined ex post attic insulation savings using the algorithms below. All variable assumptions are from the IL-TRM V5.0 unless otherwise referenced.

Equation 11. Attic Insulation Algorithms

Energy Savings (Cooling): $\Delta kWh\_cooling = (((1/R\_old - 1/R\_new) * A\_attic * (1\text{-}Framing\_factor)) * 24 * CDD * DUA) / (1{,}000 * \eta Cool) * ADJcool$

Energy Savings (Gas Heating): $\Delta kWh\_heating = \Delta Therms * Fe * 29.3$

Demand Savings: $\Delta kW = (\Delta kWh\_cooling / FLH\_cooling) * CF$

Gas Savings: $\Delta Therms = (((1/R\_old - 1/R\_new) * A\_attic * (1\text{-}Framing\_factor)) * 24 * HDD) / (\eta Heat * 100{,}067\ Btu/therm) * ADJheat$

Where:

R_old = Total attic assembly R-value prior to installing insulation

R_new = Total attic assembly R-value after the installation of additional insulation

A_attic = Total area of insulated attic (ft^2)

Framing_factor = Adjustment to account for area of framing = 0.07

ADJcool = Adjustment for attic insulation to account for prescriptive engineering algorithms over claiming savings = 80%

ADJheat = Adjustment for attic insulation to account for prescriptive engineering algorithms over claiming savings = 60%

CDD = Cooling Degree Days (applied per participant based on project location; Table 37)

HDD = Heating Degree Days (applied per participant based on project location; Table 37)

DUA = Discretionary Use Adjustment = 0.75

ηCool = Seasonal Energy Efficiency Ratio (SEER) of Central AC (applied per participant based on existing equipment age provided in database; Table 38)

Table 41. ηCool for Attic Insulation Measures

Cooling Equipment Age	CAC SEER
Before 2006	10.0
During or after 2006	13.0
Unknown[a]	10.06

[a] For measures where the cooling equipment age is not provided in the database (n=252), we calculated an average cooling efficiency based on SEER values derived from measures with cooling equipment age information.

ηHeat = Efficiency of space heating equipment = 0.70 for gas heating

FLH_cooling = Full Load Cooling Hours of air conditioning (applied per participant based on project location; Table 40)

CF = Summer Peak Coincidence Factor for Central ACs = 0.68

F_e = Furnace fan energy consumption as a percentage of annual fuel consumption = 3.14%

Appendix C. Cost-Effectiveness Inputs

Table 42 presents total gross impacts for AIC cost-effectiveness calculations. These values differ from those included in the main report due to the inclusion of heating penalties for lighting measures. This approach was taken based on discussions with AIC and past agreements between AIC and ICC staff that heating penalties would not be included in savings calculations for goal attainment. Overall, total gross program savings are reduced by 12% for kWh and 12% for therms after the application of waste heat factors.

Table 42. PY9 Multifamily Program Gross Impacts (Including Heating Penalties)

	kWh	kW	Therms
Gross Savings	4,600,937	820	189,395
Heating Penalty	-564,069	n/a	-23,515
Total Gross Savings with Heating Penalty	**4,036,868**	**820**	**165,880**

Lighting Heating Penalty

The inclusion of waste heat factors for lighting is based on the concept that heating loads are increased to supplement the reduction in heat that was once provided by the existing lamp type. The heating penalty was applied to 57,168 in-unit lamps and 1,931 interior common area lamps based on the specific heating fuel type (if known) and installed lamp type.

Common Area Lighting

Using the space heating types specified within the program-tracking database, we calculated heating penalties at the measure level. When aggregated, the total gross heating penalties for common area lighting measures are -94,614 kWh and -8,467 therms.

In-Unit Lighting

Like Common Area Lighting, we calculated the In-Unit Lighting Heating penalties at the measure level, taking into account the space heating type for each project location. In-unit lighting measures capture both CFL and LED measures. Total heating penalties are -469,455 kWh and -15,050 Therms.

Appendix D. Program Benchmarking Literature Review Detailed Methods

Benchmarking Approach

The evaluation team saw the conclusion of the program's ninth year of operation as an opportunity to reflect on the program's successes over time and determine which lessons-learned can help shape the path forward for the program. We completed a program benchmarking exercise by synthesizing past performance reports, assessing current performance in light of past results, and comparing the program to its peers –all with the goal of arming program administrators with knowledge to enhance program design and implementation in the future.

This memo reports draft results of a Ameren Illinois Multifamily program benchmarking analysis covering the eight program years spanning 2008 through May 2016 (PY1 through PY8). Benchmarking can draw on a variety of sources at any level of detail; given our PY9 evaluation resources, we used secondary sources identified through a review of the literature and focused on high-level program metrics.

We focused on answering the following research questions:

- What progress towards program goals has the Ameren Illinois Multifamily Program made since PY1?
- How does Ameren Illinois' Multifamily Program compare to other ratepayer-funded multifamily programs from other parts of the United States, in terms of factors like market and housing characteristics, program goals, and program design and implementation?
- How do the Ameren Illinois Multifamily Program's outcomes compare to those achieved by similar multifamily programs?
- What best practices have been key to the Ameren Illinois Multifamily Program's success over time (and therefore may be important to carry forward)?
- Are there any lessons-learned from other programs that Ameren Illinois could start following to enhance program design and implementation to achieve additional persistent savings?

Methods

We followed best practices for program benchmarking.[60] These best practices include using program objectives to guide the benchmarking process, selecting metrics to measure progress towards these objectives, developing a plan for data collection, and comparing the program's processes and outcomes to those of other similar programs. Benchmarking can be completed from a variety of perspectives. For this analysis, we completed benchmarking in terms of the program's historical performance and in terms of its relative performance in the multifamily sector. Throughout the report, we summarize these two types of assessments:

[60] For example, the U.S. DOE Better Buildings 2015 white paper, "Guide for Benchmarking Residential Energy Efficiency Program Progress with Examples," available at https://www.veic.org/documents/default-source/resources/reports/veic-guide-for-benchmarking-residential-energy-efficiency-program-progress.pdf?sfvrsn=2

- **Historical Performance**: We reviewed the program's achievements over time in the context of any changes in its goals and budget. To complete this, we reviewed Ameren Illinois Multifamily Program implementation plans and program evaluations from PY1 (2008) through PY8 (2015/2016). We compiled historical performance metrics that were available for each program year, including budget, participation, savings, measure mix, and researched net-to-gross (NTG) ratios.[61]

- **Peer Comparisons:** We compared the Ameren Illinois Multifamily Program to "peer" programs (i.e., other administrators' programs that serve multifamily markets in other parts of the country). To complete this, we gathered reports by the American Council for an Energy Efficient Economy (ACEEE).[62] The ACEEE reports identified and compared several multifamily programs from New England, California, and other parts of the country that ACEEE determined were "representative" programs. To these, we also added recent program evaluation reports from other Illinois multifamily programs. We focused our attention on cases where lessons-learned seemed transferrable to Ameren Illinois based on similarity in programs' scope, funding, regulation, and other attributes that influence program design and goals.

Additionally, we selected a set of high-level program metrics to compare over time and across programs. We used our research questions, suggestions for metrics of interest from program and implementation staff, and a review of metrics reported in ACEEE benchmarking reports to select benchmarking metrics. The metrics cover program design, implementation, and results across programs. Table 43 shows the metrics we used.

Table 43. Program Metrics Used for Internal and External Benchmarking

Category	Metric	Historical Performance	Peer Comparisons
Context	Multifamily markets (eligible units and units served)		✓
Program Design and Implementation	Delivery model	✓	✓
	Budget	✓	✓
	Measure offerings	✓	✓
Achievements	Annual savings	✓	✓
	Annual participation	✓	✓
	Cumulative participation as a percentage of building stock		✓
	Net-to-Gross Ratios	✓	

Finally, during our assessment, we took note of best practices for designing and implementing multifamily programs and later assessed Ameren Illinois' progress towards adopting each one. This best-practice review serves as a list of action items that Ameren Illinois may be able to take to ensure continued success.

Selecting Peer Programs for Comparison

A brief search for multifamily energy efficiency programs in the United States shows that 32 of the 51 largest U.S. electric utilities offer multifamily energy efficiency programs.[63] It was beyond the scope of our effort to

[61] For program administrators that track individual programs' goal achievement as a performance metric, reviewing historical goal achievement can be part of this exercise. However, given that AIC manages to a portfolio-level goal as opposed to program specific goals, we do not report on program year goal achievement over time.
[62] See ACEEE's series of reports published under their Multifamily Energy Efficiency Project. http://aceee.org/multifamily-project
[63] Relf, G., S. Nowak, and B. Baatz. (2017). Utility Energy Efficiency Scorecard. Retrieved from: http://aceee.org/research-report/u1707

review each of these 32 programs. As a result, we relied on existing program syntheses to identify representative energy efficiency programs against which we could compare the Ameren Illinois Multifamily Program.

We reviewed seven synthesis reports on multifamily energy efficiency program best practices[64],[65],[66],[67],[68],[69],[70]. From these, we determined whether the programs summarized in the reports were comparable to the Ameren Illinois Multifamily Program. We retained programs that met at least one of two criteria:

- The program serves multifamily properties in the state of Illinois, and/or
- The program was identified as a best-in-class program by Ross et al. (2016).[71]

Table 44 contains the seven programs that we compared to the Ameren Illinois Multifamily Program.

[64] ACEEE. (2014). Recommendations and Best Practices for Revising Incentive Structure. Retrieved from http://aceee.org/sites/default/files/pdf/revising-incentive-structure.pdf

[65] Cluett, R., & Amann, J. (2015). Multiple Benefits of Multifamily Energy Efficiency for Cost-Effectiveness Screening. Retrieved from http://aceee.org/research-report/ie1502

[66] Farley, K., & Mazur-stommen, S. (2014). Saving Energy with Neighborly Behavior: Energy Efficiency for Multifamily Renters and Homebuyers. ACEEE White Paper. Retrieved from http://aceee.org/sites/default/files/pdf/white-paper/saving-energy-with-neighborly-behavior.pdf

[67] Johnson, K. (2013). Apartment Hunters: Programs Searching for Energy Savings in Multifamily Buildings. Retrieved from http://aceee.org/research-report/e13n

[68] McKibbin, A. (2013). Engaging as Partners in Energy Efficiency: A Primer for Utilities on the Energy Efficiency Needs of Multifamily Buildings and Their Owners. Retrieved from http://www.elevateenergy.org/wp/wp-content/uploads/2014/01/Engaging_as_Partners_in_Energy_Efficiency_Primer_for_Utilities_on_the_Energy_Efficiency_Needs_of_Multifamily_Buildings.pdf

[69] Ross, L., Jarrett, M., & York, D. (2016). Reaching More Residents: Opportunities for Increasing Participation in Multifamily Energy Efficiency Programs. Retrieved from http://aceee.org/research-report/u1603

[70] Vermont Energy Research Organization. (2014). Guide for Benchmarking Residential Energy Efficiency Program Progress. Retrieved from https://energy.gov/eere/better-buildings-residential-network/downloads/guide-benchmarking-residential-energy-efficiency

[71] Ross et al.'s paper focused on programs that embody typical multifamily program characteristics seen throughout the United States, in terms of program design, budget and participation. We determined that the programs which Ross et al. (2016) identified are all similar enough to the Ameren Illinois program to provide a good basis of comparison: notably, like the Ameren Illinois' Multifamily Program, all have dual fuel offerings, offer direct install and major measure components, and realize a high energy savings per unit.

Table 44. Ameren Illinois' and Comparison Multifamily Programs and Budgets

Utility, Program, and State	Year Compared	Total Annual Budget	Marketing Budget
Ameren Illinois: AIC and IPA Multifamily (IL)	2016	$17,176,270	$25,807
BayREN: Multifamily Building Enhancements (CA)	2015	$9,003,227	$146,339
Con Edison: Multifamily Energy Efficiency Program (NY)	2015	$12,000,000	$325,000
National Grid: Multifamily Retrofit + Low Income Retrofit (MA)	2014	$44,023,522	$459,301
National Grid: Energywise Multifamily + Income Eligible Multifamily (RI)	2014	$7,697,800	Unknown
Puget Sound Energy: Multifamily Existing (WA)	2014	$13,697,885	Unknown
ComEd, Nicor Gas, and People's Gas: Multifamily Comprehensive Energy Efficiency Program (IL)	2013	$19,000,000	$300,00
CNT Energy Savers Program (IL)	2012-2013	$5,269,0942	$2,505,951

Sources:
BayREN, ConEd, DCSEU, NGRID MA, NGRID RI, Puget Sound Energy: Ross, L., Jarrett, M., & York, D. (2016). Reaching More Residents: Opportunities for Increasing Participation in Multifamily Energy Efficiency Programs. Retrieved from http://aceee.org/research-report/u1603
Ameren Illinois: Opinion Dynamics. (2017). Evaluation of the 2016 (PY8) Illinois Power Agency Residential Multifamily Program. Retrieved from http://ilsagfiles.org/SAG_files/Evaluation_Documents/Ameren/AIU_Eval_Reports_PY8/PY8_AIC_Multifamily_Evaluation_Report_FINAL_2017-02-21.pdf
CNT Energy Savers and ComEd, Nicor, and People's: Johnson, K. (2013). Apartment Hunters: Programs Searching for Energy Savings in Multifamily Buildings. Retrieved from http://aceee.org/research-report/e13n

Best Practice Compilation

The evaluation team organized and analyzed reports in the qualitative data analysis software NVIVO. Before starting the qualitative analysis, we selected specific themes to look for in each report. These themes corresponded with the research objectives and included:[72]

- General best practices and strategies to overcome barriers aggregated from multiple programs (without specific relevance to Ameren Illinois)
- Strategies for increasing program participation in saturated markets
- Best practices with relevance for Ameren Illinois' Multifamily Program
- Case studies of how other individual multifamily programs employ best practices

We did not record best practices that fall outside Ameren Illinois' decision-making authority. For example, we did not include best practice suggestions for changing cost effectiveness test requirements because the Illinois Commerce Commission (ICC) has jurisdiction over cost-effectiveness testing requirements, not Ameren Illinois.

[72] Additional themes were added throughout the literature review process so there may be some overlap between themes.

Appendix E. Additional Benchmarking Report Best Practices

Practices that Ameren Illinois is Currently Following

The ACEEE best practice reports offered several recommendations, which Ameren is currently following with the implementation of their Multifamily Program. In this section, we discuss how the Multifamily Program is currently following each best practice recommendation as well as include suggestions for how the program can continue moving forward with each best practice. These best practices include:

Partner with program allies to implement and market the program

Collaborating with program allies can increase the program's reach and provide mutual benefit to both the allies and the administrator. Allies often bring access to a network of customers in the program administrator's service territory, and through their process of reaching out to customers to market the program, the allies boost program engagement and generate additional business for their company.[73] The Ameren Illinois Multifamily Program follows this best practice and relies on program allies to deliver the major measures program offering. Program allies are responsible for generating leads, enrolling customers and completing installations for the major measures component of the Multifamily Program.

Mckibbin (2013) emphasizes that once a program is using program allies, their ability to foster relationships with multifamily customers becomes a vital way to encourage program participation. Given the importance of ally-driven participation, it benefits the administrator to consider program ally perspectives when considering a design change[74]. Where program changes are needed, minimizing funding disruptions and providing program allies and other implementers time to adapt to the new format can minimize risks of the program not meeting its annual goals or, in the long term, hurting relationships with these vital program partners.

Considerations

- Ameren Illinois should continue to use program allies to market and deliver the program to customers.
- AIC program administrators should work closely with program allies and program implementers in PY10 when the program is expected to undergo changes. Coordinating with implementers and program allies will help ensure that program changes appear seamless from the customer's perspective.

Integrate direct install measures with more comprehensive program offerings

Multifamily properties involve a variety of building systems, each of which presents a different type of energy-saving opportunity. Programs that offer upgrades for only one building system miss the opportunity to achieve a complete upgrade while they are on site. Additionally, multifamily properties may have a challenge securing capital and this poses a barrier to achieving deep savings beyond simple retrofits for easily-accessible systems, like common areas and tenant units.

[73] Ross, L., Jarrett, M., & York, D. (2016). Reaching More Residents: Opportunities for Increasing Participation in Multifamily Energy Efficiency Programs. Retrieved from http://aceee.org/research-report/u1603

[74] McKibbin, A. (2013). Engaging as Partners in Energy Efficiency: A Primer for Utilities on the Energy Efficiency Needs of Multifamily Buildings and Their Owners. Retrieved from http://www.elevateenergy.org/wp/wp-content/uploads/2014/01/Engaging_as_Partners_in_Energy_Efficiency_Primer_for_Utilities_on_the_Energy_Efficiency_Needs_of_Multifamily_Buildings.pdf

These are sector-wide challenges throughout the country. Some California utilities have tried to achieve deeper savings by offering customers a more custom approach for delivering upgrades. However, early pilots show that designing incentive structures to encourage retrofits that are deeper than what could have been achieved through a simple prescriptive program requires strategic thinking.[75] Johnson (2013) recommends an intermediate approach, which could bundle direct install measures with more comprehensive ones (such as building shell measures).[76] This makes use of early interactions with customers who may initially come into the program via their interest in well-known measures, to encourage them to achieve deeper savings. Direct install components tend to be more palatable for property managers because they are often free or no cost and less intrusive to tenants than more comprehensive upgrades.[77] Once customers begin to see benefits of direct install measures, they are more likely to install more comprehensive measures or seek out more efficient upgrades when their equipment fails.[78] The Ameren Illinois Multifamily Programs currently offers both direct install measures and major measure upgrades, effectively capitalizing the opportunity to reach multiple building systems at once.

Considerations

- Ameren Illinois should continue to offer *both* major measures and direct install offerings to customers.

Offer rebates and program offerings to overcome split incentives

Mckibbin (2013) suggests multifamily programs should offer incentives that are substantial enough to motivate property managers and owners to participate in the program even when they do not directly receive the financial benefits of participating in the program. The Ameren Illinois Multifamily Program offers incentives that essentially cover the entire cost of the upgrades, which addresses the split incentive issue. Furthermore, the program offers measures that result in energy saving benefits in parts of the building where property managers are responsible for paying the energy bills. These measures include common area and major measure upgrades.

Considerations

- Ameren Illinois *should* continue to offer program measures to overcome split incentives, as this best-practice seems to be working well. This includes offering measures at a rate that is free or low cost to customers and continuing to offer measures that result in economic benefits for property managers.

Conduct market characterization surveys and target marketing to appropriate market segments

Multifamily programs tend to serve a variety of property arrangements, including small, medium, and large complexes. These different property arrangements have implications for program delivery as buildings can vary in terms of important delivery factors such as key decision maker contacts and levels of approval and this

[75] Opinion Dynamics. (2014). SCE/SoCalGas Energy Upgrade California Multifamily Pilot Evaluation. Retrieved from http://www.calmac.org/publications/SCE_SoCalGas_EUC_MF_Pilot_Final_Report_2017-05-16.pdf

[76] Johnson, K. (2013). Apartment Hunters: Programs Searching for Energy Savings in Multifamily Buildings. Retrieved from http://aceee.org/research-report/e13n

[77] ACEEE. (2014). Recommendations and Best Practices for Revising Incentive Structure. Retrieved from http://aceee.org/sites/default/files/pdf/revising-incentive-structure.pdf

[78] McKibbin, A. (2013). Engaging as Partners in Energy Efficiency: A Primer for Utilities on the Energy Efficiency Needs of Multifamily Buildings and Their Owners. Retrieved from http://www.elevateenergy.org/wp/wp-content/uploads/2014/01/Engaging_as_Partners_in_Energy_Efficiency_Primer_for_Utilities_on_the_Energy_Efficiency_Needs_of_Multifamily_Buildings.pdf

can complicate program marketing and outreach strategies.[79] Market characterization surveys can help program administrators better understand the market segments in their service territory. Program administrators can then use this information to target each segment by demonstrating the value of the program to the specific segment. In PY7, Ameren Illinois commissioned a characterization of the multifamily housing market within Ameren Illinois' service territory. The market characterization report presents detailed information about the number of multifamily buildings within AIC's service territory as well as the location of these buildings.[80] Major findings are as follows:

- There are approximately 156,103 multifamily units (3+ occupancy) in the AIC service territory and these units are primarily located in large urban areas. Buildings targeted by the program (3+ units and market rate) tend to be both located on the outskirts of major metropolitan areas (i.e., the suburbs) or in more rural communities and also tend to be smaller (i.e., contain 9 or fewer units). A vast majority (96%) of units in multifamily buildings in Ameren Illinois service territory are occupied by renters, rather than owners.
- According to participating property managers, electricity is the most common space heating (74%) and water heating (67%) fuel type in multifamily buildings within Ameren Illinois' service area.

Considerations

- Ameren Illinois should disseminate findings from the PY7 market characterization report to program allies.

Coordinate program providers and streamline program offerings to simplify customer access to the program

Dual-fuel customers can find it burdensome to participate in separate electric and gas multifamily energy efficiency programs.[81] As such, developing programs that encompass both gas and electric offerings streamlines the program participation process for property managers.[82] In addition, program implementers that coordinate back-end systems (e.g., ally networks, marketing materials, tracking datasets, etc.) may be able to improve program effectiveness and achieve efficiencies.

Johnson (2013) also suggests making customer access to the program and technical services offered by the program as simple as possible by providing customers with a single point of contact throughout the program participation process.[83] A single point of contact or "one stop shop" can help customers with application, QA/QC, rebate, and EM&V processes. Furthermore, a single point of contact can help ensure that a program run by multiple utilities or implementers appears as one coordinated program to the customer.

The Ameren Illinois Multifamily Program currently serves both gas both gas and electric customers through the AIC program and electric-only customers through the IPA program. In line with guidance about streamlining customer experience, the program markets the AIC and IPA programs as a singular integrated program.

[79] Ross, L., Jarrett, M., & York, D. (2016). Reaching More Residents: Opportunities for Increasing Participation in Multifamily Energy Efficiency Programs. Retrieved from http://aceee.org/research-report/u1603
[80] Opinion Dynamics. (2016). Evaluation of the 2014 (PY7) Ameren Illinois Company Residential Multifamily Program. Retrieved from http://ilsagfiles.org/SAG_files/Evaluation_Documents/Ameren/AIU_Eval_Reports_PY7/PY7_AIC_MF_Report_FINAL_2016-01-19.pdf
[81] Johnson, K. (2013). Apartment Hunters: Programs Searching for Energy Savings in Multifamily Buildings. Retrieved from http://aceee.org/research-report/e13n
[82] Ibid
[83] Ibid

While Ameren Illinois' program attempts to streamline the four different actors (Leidos, AIC, ClearResult, and program allies) which currently work together to operate the Ameren Illinois Multifamily Program, the number of actors mean that customers may not always have a single point of contact as they upgrade different building systems. When needed, customers have the option of calling the AIC call center if they have a question during the program participation process, but a true "single point of contact" approach would mean that each customer can reliably call one entity for information from the beginning to the end of their participation.

Considerations

- Ameren Illinois should consider the ways in which it can further enhance customer experience in the program, especially with respect to channeling properties from the implementer to the allies. According to allies, it is becoming more difficult to identify leads and find new savings opportunities. Any additional communication between actors could ensure that no savings opportunities are slipping through the cracks. Without a redesign, it may not be possible to take the most extensive streamlining step of consolidating implementation to a single point of contact that would can usher customers through all stages and elements of the Ameren Illinois program.

Appendix F. Program Ally Research Memo

Memorandum

To: Jonathon Jackson, Ameren Illinois Company; David Brightwell, ICC Staff
From: The Opinion Dynamics Evaluation Team
Date: August 24, 2017
Re: PY9 Multifamily Program Ally Research Findings

Introduction

As the Ameren Illinois Multifamily Program[84] wraps up its ninth year of operation and Ameren Illinois Company (AIC) looks ahead to the next plan cycle, there is an opportunity to reflect on program successes over time, as well as the future path forward for the program. In particular, program administrators and implementers will need to identify best practices from prior program years, while responding to the new framework established by the Illinois Future Energy Jobs Bill.

Within this context, the evaluation team conducted research with Multifamily Program allies, who play an important role in marketing and implementing the Ameren Illinois Multifamily Program's major measure offerings including air sealing and insulation. Furthermore, program allies offer a key perspective on the multifamily property market. Opinion Dynamics completed interviews with five of the six program allies active in the program during PY9 (i.e., which enrolled at least one property). We used the interviews to investigate program allies' success in bringing projects into the program, program ally satisfaction, any impacts of program participation on program ally business and practices, and program allies' suggestions for program improvement. We also asked program allies to think back over their tenure within the program to reflect on their experiences. The team used information from these interviews to understand energy efficient product saturation in the multifamily market from the program allies' perspective, and to learn how program changes over time may have affected allies.

This memo summarizes the findings from these interviews. Due to the small population of allies, we report all findings in terms of absolute prevalence (e.g., 3/5 indicates 3 of 5 interviewees). We recommend that readers keep the small number of respondents in mind when reviewing the findings.

Program Ally Participation and Firmographics

Program Ally Participation

Program implementation staff reported that the level of program ally participation was adequate to meet program goals for the AIC program, but that the IPA program could have benefitted from enrolling additional program allies.[85] In addition, program implementation staff reported the IPA Multifamily Program began two

[84] Funding for major measure upgrades is provided by AIC on the gas side and through the Illinois Power Agency (IPA) procurement process on the electric side. We refer to both the IPA and AIC components together as the "Ameren Illinois" Multifamily Program.

[85] In PY9, four program allies completed projects through both the AIC and IPA programs and two additional allies completed projects strictly through the IPA program.

months late in PY9 due to negotiations between AIC and the program implementer about how to offer the program in a cost-effective way. The program implementer reported that program allies had to shift or lay off work crews in response to the delayed program start. As such, the implementer reported that it would have been beneficial to have additional allies enrolled in the program when the program came back online.

Program allies had varying reasons for becoming involved in the program. Most allies (3/5) were primarily looking for business opportunities after they became Building Performance Institute (BPI) certified. Two allies were introduced to the program at an industry group meeting (a conference and a trade show) and began completing projects through the program shortly thereafter. Individual allies also mentioned that they got involved with the program as a result of previous experience with the program through a different organization (1/5) or because they viewed the program as a good business opportunity (1/5). As of today, most allies (4/5) are requesting program incentives for all of the multifamily projects they complete in AIC service territory. One ally serves additional types of multifamily buildings that do not qualify for incentives through the multifamily program.

Program Ally Firmographics

Ameren Illinois Multifamily program allies all operate relatively similar types of businesses, with all interviewed allies (5/5) primarily offering building shell and HVAC upgrades to their customers. Three allies only offer insulation, air sealing, and air infiltration measures. The remaining two allies also offer additional services including roofing, HVAC, plumbing and pool services. Interviewed allies complete all or most of their work in the residential sector, with three of the five also working on projects in light commercial buildings. In addition, most (4/5) allies serve slightly more urban communities than rural communities; specifically, allies reported that urban customers are 50% to 75% of their customer base. Table 45 presents additional characteristics of Multifamily Program allies.

Table 45. Characteristics of Ameren Illinois Program Allies

	Average	Range
Firm size	27 employees	9 to 50 employees
Years active in the program	6 years	3 to 8 years

Program ally firms appear to fall into two sets– “active” allies and “less-active” allies– based on their self-reported descriptions about their relative involvement in, and dependence on, the AIC program to generate business:

- The group of relatively more “active” allies consists of two companies who completed PY9 projects throughout the entire AIC service territory. The active allies both reported that the program had a large influence on their decision to complete upgrades in multifamily buildings in the AIC service territory. Specifically, both of these allies reported that their work in this sector and territory was negligible before they began participating in the program (less than 2% of all work completed in AIC service territory), but that the share of work they complete in multifamily properties jumped to 85% and 99% of their projects in the AIC service territory after they began participating the program. In addition, these two allies also reported their businesses are reliant on air sealing and insulation projects, as they do not offer additional services besides these offerings.

- The other group of allies consists of three companies that are each headquartered within AIC service territory and which generally complete projects within a more limited radius of their headquarters. For these allies, multifamily projects are a smaller share (<10%, on average) of their total projects in AIC service territory. These allies also reported that the share of work they complete in multifamily properties

has not changed much since they started participating in the Multifamily Program. Some of these allies have business models that are less-reliant on air sealing and insulation projects, with two out of these three allies offering services besides air sealing and insulation.

Marketing and Outreach

Lead Generation and Marketing

According to CLEAResult, the program relies almost exclusively on program allies to market the major measures program offerings. When we asked allies about their marketing and outreach strategies, all allies confirmed that they do market the program to customers and further noted that they have developed their own strategies for identifying and recruiting customers to the program.

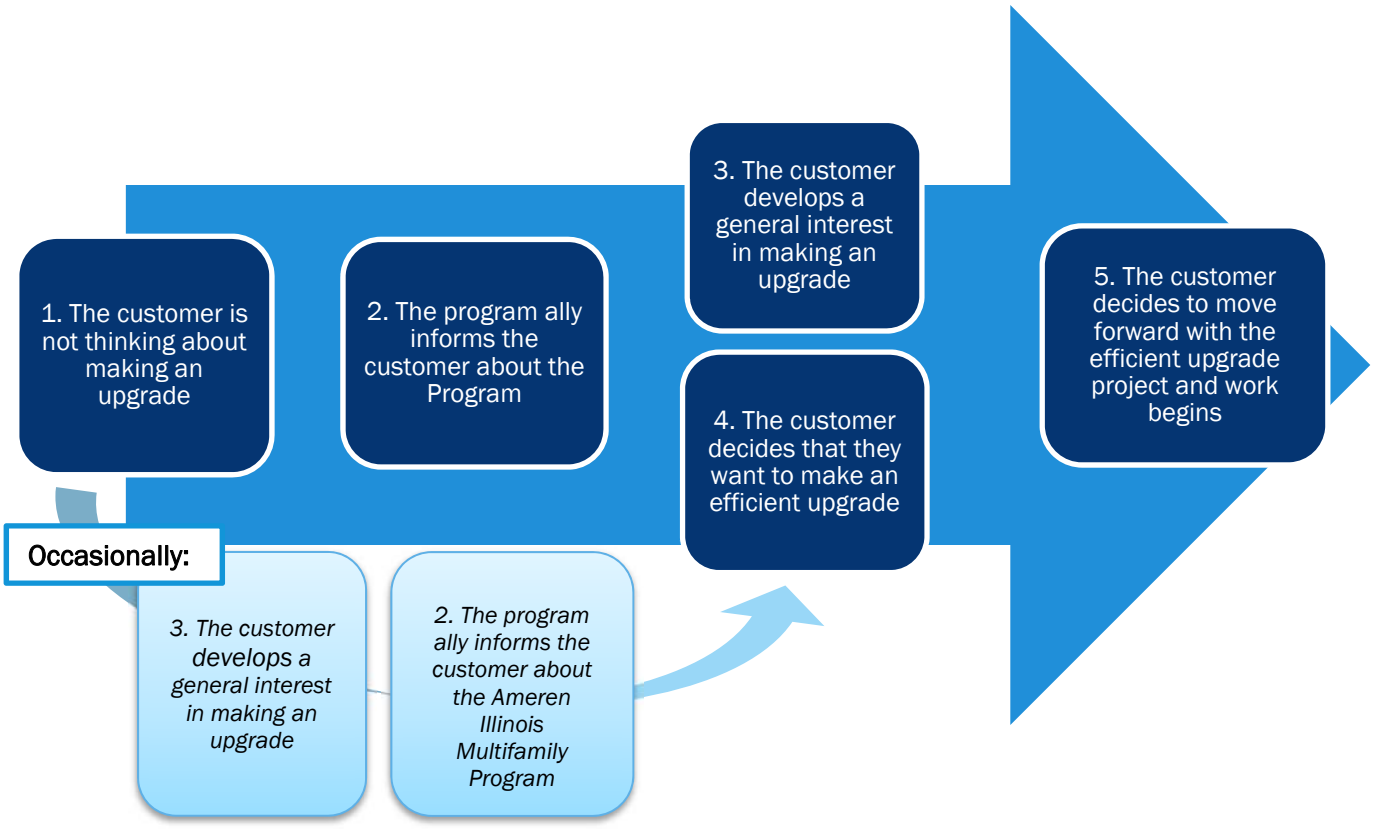
- Program Ally Responsibilities: The Ameren Illinois Multifamily Program design splits program outreach and delivery across program allies and the implementer. Allies focus on major measures, while the implementer focuses on in-unit and common area upgrades. However, since a building may qualify for multiple types of upgrades, the program design relies on informal lead sharing between program allies and the implementer. Program ally feedback suggests that lead sharing tends to flow from allies to the implementer, rather than the other direction. Allies reported that they do most of their own marketing, and only get a negligible share (<2% on average) of their new customers from CLEAResult referrals. All allies reported that they market the Multifamily Program to every one of their customers in the AIC service territory whom they think may qualify for the program.

- Outreach Strategies: Program allies are using a wide variety of different outreach approaches to promote the program. Program allies, for example, identify customers by attending landlord association meetings (1/5), identifying properties on Google Maps (2/5), leveraging existing relationships with property managers (1/5), searching for opportunities via "For Rent" ads on the internet or in person (1/5), becoming involved with community associations (1/5), featuring the program on their webpage (1/5), and searching through county tax assessor data (1/5). After leads are identified, most (3/5) program allies market the program through door-to-door outreach, driving up to complexes which they previously identified and knocking on doors. One ally markets the program by actively recruiting property managers at rental property professional association meetings.

Property Manager Decision-Making

To further understand the customer journey to installing major measures through the program, we asked the PY9 allies to further describe their outreach to, and marketing interactions with, property managers. Based on program ally responses, we developed Figure 3 to show the steps that program allies believe customers take when they make the decision to complete specific energy-efficient upgrades though the Multifamily Program. As noted above, program allies generate most of their leads by cold calling and going door-to-door, instead of fielding inbound phone calls from already-interested customers. This means that allies are recruiting from a pool of all types of property managers, not just those who are interested in energy efficiency. As such, not all property managers are aware of the program when program allies first approach them, and not all have been actively thinking of doing an upgrade. According to allies, customers generally develop an interest in making multifamily upgrades after the program ally tells them about the upgrades (Figure 3).

Figure 3. Program Ally Perceptions of Pathways to Property Manager Participation



Occasionally, steps two and three occur in opposite order (2/3), as indicated by the lighter arrows. In these cases, customers approach allies with a general interest in making an upgrade and then the ally then tells them about the Multifamily Program. All allies (5/5) felt that informing their customers about the incentives available through AIC or IPA specifically leads their customers to choose energy efficient upgrades. Program allies who market to customers with no prior interest in making upgrades indicated that steps 3 and 4 often happen simultaneously because these allies only market efficient upgrades that qualify for incentives from AIC to the customer.

PY9 Program Implementation

PY9 Program Successes & Challenges

In general, allies felt that the program operated in an efficient manner once it was up and running. We discussed CLEAResult's responsiveness with 3 of 5 interviewees; in all 3 cases, interviewees pointed out that CLEAResult was very timely and responsive in terms of processing applications and paying out incentives, which allowed the allies to continue to seek out new jobs. One program ally identified the reservation system as a particularly well-functioning process, because it helped keep them up to date about the status of the program budgets and the amount of incentive left. In addition, another ally reported that their interactions with AIC were very positive, and highlighted the training and application process as specific aspects of the program that functioned well.

Overall, program allies reported that the largest challenges they faced in delivering the program in PY9 were a result of program disruptions and changes. As discussed previously, the PY9 IPA Multifamily Program began two months late due a renegotiation process to make the program cost-effective. Of the two "active allies," both reported that this program delay limited the amount of time they had to recruit participants to the program. Additionally, these two allies felt that program delays made it hard to determine how to allocate staff resources: specifically, the challenge was in terms of keeping enough staff employed so that the company could be prepared take full advantage of the program once it was opened, while avoiding having staff sit idle until that point. One ally also identified turnover in one of the program manager positions at CLEAResult halfway through the year as another challenging program change.

Satisfaction

PY9 Program Satisfaction

Overall, program allies were satisfied with the PY9 Ameren Illinois Multifamily Program. On a scale of 0 (not at all satisfied) to 10 (extremely satisfied), allies provided an average rating of 8.6, with the lowest rating being a 7 (n=5). When prompted to discuss reasons for rating their satisfaction as less than a 10, program allies tended to cite challenges related to funding disruptions and the way that the program handled and communicated those changes to program allies. Allies felt that once the program was up and running, the implementation process ran smoothly and they recalled having positive interactions with AIC and CLEAResult.

Long-term Program Satisfaction

As discussed previously, the Ameren Illinois Multifamily Program is entering its tenth year of operation. We asked allies to characterize their experience with the Multifamily Program as it evolved over time. Allies highlighted a variety of program aspects that have changed since they began serving customers though the program and which influenced their satisfaction with the program. Each ally was able to provide a limited perspective based on their own experiences, but collectively the allies recalled changes in four key program elements: applications, training, guidelines, and program budgets.[86]

Allies noted the program guidelines dictating the type of properties that qualify for the program have become more stringent over time. Program guidelines in the PY9 Program Implementation Plan specify that allies can upgrade properties with a ceiling insulation value of R-11 or less to a minimum of R-49. The PY9 insulation guidelines were stricter than PY8, when allies could upgrade properties with an R-value of R-19 or less. For some allies, the change reportedly makes it more challenging to find buildings to serve through the program. In addition, allies highlighted that multifamily program budgets have increased over time. Program allies had differing views about the effect of the budget increases on their experience with the program. One ally viewed the increased program budgets as a positive change, because the program frequently ran out of funding in early program years. In contrast, most (3/5) allies, particularly the less active ones, perceived that multifamily upgrade opportunities began dwindling after the program increased the budget for incentives. In addition, in PY6 program staff implemented a reservation system that allocated 60% of all multifamily upgrade jobs to one contractor and kept the remaining jobs open to bids by other contractors. There was some sense among the less-active allies that the exclusive contract setup had made it difficult for the less-active allies to really contribute to program savings.

Impacts on Allies' Business Practices

[86] Each program aspect represents the views of one program ally.

The evaluation team asked allies to reflect on whether their participation in the Multifamily Program affected their business practices over time, and if so, how.[87] Overall, program allies reported that the program has had a positive impact on their business, and has helped them increase the quantity of air sealing and insulation projects they complete. Specifically:

- All program allies (5/5) reported the percentage of multifamily upgrade situations in which they complete air sealing and install high-efficiency insulation in AIC service territory increased greatly after they began participating in the Multifamily Program.
- Similarly, all program allies (5/5) reported the total volume of air sealing and insulation projects they complete for multifamily buildings in AIC service territory increased greatly after participating in the program. One ally's explanation of the influence of the program on their business practices was representative of the views of several program allies, noting that:

  "It gave us the opportunity to do work that we wouldn't otherwise do because of the rebates. We did a dramatic amount more work due to the rebates that were available. We were able to offer these rebates to folks that would not otherwise seek out these energy efficient upgrades, but once they were made aware of them they wanted to have them done. The volume of our work and the type of work that we were able to do went up significantly in the last three years due to the Multifamily Program."

- Furthermore, most program allies (4/5) felt that they have a somewhat- or greatly increased sense of comfort in discussing the benefits of air sealing and high-efficiency insulation with multifamily property managers and owners since participating in the program.
- Fewer program allies reported a notable change in their knowledge of air sealing and high efficiency insulation in multifamily buildings due to program involvement. Three of five said their knowledge did not increase, noting that they had received training in this area before they began participating in the program. Remaining (2/5) allies said that the program did greatly increase their knowledge in this area.

Future Opportunities

When asked to consider remaining potential for continued energy savings in the AIC multifamily market, allies reported that it has become more difficult for them to identify upgrade opportunities. Most (4/5) allies feel that almost all the larger buildings that qualify for the program have already received eligible upgrades. Further, program allies believe the large property market is especially saturated with respect to the so-called "low-hanging fruit." Program allies generally expressed frustration with the lack of opportunities left in the market under current guidelines, with one commenting:

"Quite honestly, the market is extremely saturated with the current guidelines set for the electric program"

During the evaluation team's interview with program implementation staff, the staff expressed concern that program allies may have limited interest in serving the remaining eligible properties, which tend to be smaller properties and/or those located in rural areas. Further, the program staff wondered whether allies may react to this challenge by choosing to refocus their efforts on other programs. To gather more information on this topic, we asked program allies about their main considerations when deciding whether to pursue opportunities in urban vs. rural markets in AIC service territory. Most of the allies say they work in both urban and rural areas

[87] When allies were asked about how their business volume of work changed, they were given the following response options; "did not increase", "increased somewhat", and "increased greatly."

(4/5) and all of those who do (4/4) said they do not take the community type into consideration when they decide whether to take a job. Allies expressed a willingness to work wherever there are jobs available.

Despite the perception of overall market saturation, program allies identified low-income multifamily buildings, small towns, smaller complexes, and gas customers as market segments that still offer savings opportunities. Overall, allies feel that many of the smaller towns and complexes have been passed over by companies in pursuit of easier opportunities, but that these smaller towns and complexes do present savings opportunities. In addition, AIC will likely offer upgrades to low income multifamily customers in 2018 and one program ally specifically mentioned this as an important opportunity to continue generating new business. Program allies also suggested that demand for upgrades in gas-fuel buildings exceeds the available incentives. Implementation staff also echoed that they see a demand for upgrades from customers on the gas side.

Program allies noted that to capitalize on opportunities for achieving additional savings in multifamily buildings, program guidelines for qualifying air sealing and insulation projects would need to change, and/or the program would need to add additional measures. Additional measure suggestions included air source heat pumps, crawl space insulation, fans and air circulation measures, attic insulation with higher R-values, and insulating around "knob and tube" wires. Implementing any of these recommendations would require changes in program design, as well as consideration of cost-effectiveness. These changes may or may not be feasible from a program design standpoint. Outside of changing program design, one ally suggested that program staff could assist allies in finding the remaining opportunities for serving multifamily buildings by sharing market research and segmentation studies with them. This would reduce allies' search costs of finding and marketing to the harder-to-serve properties.

Program Allies' Vision for the Future of the Program

As program allies reflected on the program evolution over time, we asked them to highlight ongoing challenges they feel should be addressed in future program years, and to highlight aspects of the program that they would like to see carried forward to future years based on their history of success. Below is a summary of their comments, blended with recommendations.

Successful Program Elements to Continue

- **Incentive Levels:** Overall, most (3/5) program allies identified the incentive level for major measures as a key factor to the success of the program. Major measures offerings are offered at no cost to property owners and program allies feel the no-cost upgrades attract property managers to the program. Allies believe the program should continue to offer major measures for free. Program allies expressed concern that property owners would not participate in the program if they had to pay for upgrades. As two allies said:

  > *"We've seen it time and time again in other markets that they have offered even a 75% incentive, and because the owners do not pay the utility cost, they just won't spend the money on something that is not visible. They're running a business, and I get why they won't do it, but we've seen failure time and time again when it is not subsidized 100% in multifamily."*
  >
  > *"I think the incentive levels are really generous, really good. I would like to see them stay where they are."*

Challenges and Suggested Solutions to Address Them

- **Challenge: Dwindling cost-effective savings opportunities:** Most allies feel that as they have already worked through many of the easier-to-serve properties, they are now seeing remaining buildings that are more scattered throughout the territory than before, and are seeing properties that are less cost-effective for them to work with. In addition, one ally reported that the rate the program pays program allies has not changed since the program began, which suggests allies are expending more effort to receive the same compensation. Reportedly, allies perceive that it is becoming harder make a profit by serving customers through the program as program saturation is increasing. One ally explained the challenge of serving customers in the current market:

  "We're just not able to be cost effective as a company and operate in that territory with only trying to survive on the few, far and in between."

  - **Suggested Solution**: Consider taking a holistic look at program design and operations to identify a path to sustained cost-effective savings for the program. One path forward involves assisting allies with identifying remaining eligible multifamily buildings. If regulatory requirements and portfolio considerations allow for it, additional paths could include bringing new measures into the program and/or modifying program guidelines. For example, to market new measures, allies could utilize existing networks of past participants and revisit these easy-to-find properties.

- **Challenge: Program disruptions and changes in program guidelines:** As mentioned previously, program allies identified dealing with incentive disruptions and guideline changes as the most challenging aspect of delivering the program in PY9. Allies mentioned that this issue was not unique to PY9 and, in fact, noted this has been an ongoing challenge. Previous Multifamily Program evaluations revealed the major measures component of the program also operated for a limited time window in both PY5 and PY6.

  In addition, program allies identified the continual tightening of program guidelines as an ongoing challenge for program delivery. Because their strategy is to recruit customers ahead of time, some allies say that delayed program year launch and midyear changes in guidelines can result in customers no longer qualifying for upgrades after guidelines change or program incentives run out. Some allies have strong feelings about these impacts, expressing a sense of wasted effort in years that there have been big disruptions. Program allies who rely on business created by the Multifamily Program as part of their business model noted that program disruptions and changes have made it difficult to stay committed to the program over the years.

  - **Suggested Solution:** To the extent possible, program staff should continue to clearly and proactively communicate with allies well in advance of anticipated program changes. Two allies recommended that it would be helpful if program staff gave allies plenty of advance notice about changes in program guidelines and program structure. Providing allies with clear communications well ahead of program changes helps allies to plan for adaptation, such as ensuring that they will have the labor capacity to meet program goals once the program launches.

- **Challenge: Barriers to market entry among less active allies:** A few allies (3/5) felt pushed out of the market by more active allies that previously had exclusive contracts with Ameren Illinois. These allies felt that the incentives often ran out by the time that they began signing up participants for the program. In general, these allies also had a more difficult time navigating program processes including keeping up with guideline changes, finding customers to qualify for the program and figuring out how to market the program. One ally in particular felt that their firm had the bandwidth to be more active in the program but the incentives were generally gone by the time they found participants that qualified.

  - **Suggested Solution:** If maintaining a diverse pool of multiple allies continues to be a priority, consider ways to level the playing field, like providing assistance to all allies with respect to lead

generation and marketing. Interviewees identified several opportunities for program staff to assist allies regarding customer recruitment, especially the less active allies who may have fewer in-house administrative staff or less-frequent interaction with program staff, compared to more-active allies. One ally also suggested that it would be helpful if the program adopted a certification process to help property managers market their units as energy efficient; in turn, this could provide another marketing opportunity for allies to promote when selling the program. In addition, another ally suggested that it would be helpful if program administrators provided allies with a brochure describing both the monetary and non-energy benefits of the program that the ally could use for program marketing. Program staff should redouble efforts to ensure all allies receive the marketing materials designed for them.

For more information, please contact:

Hannah Howard
Managing Director

510 444 5050 tel
510 444 5222 fax
hhoward@opiniondynamics.com

1 Kaiser Plaza Suite 445
Oakland, CA 94612