

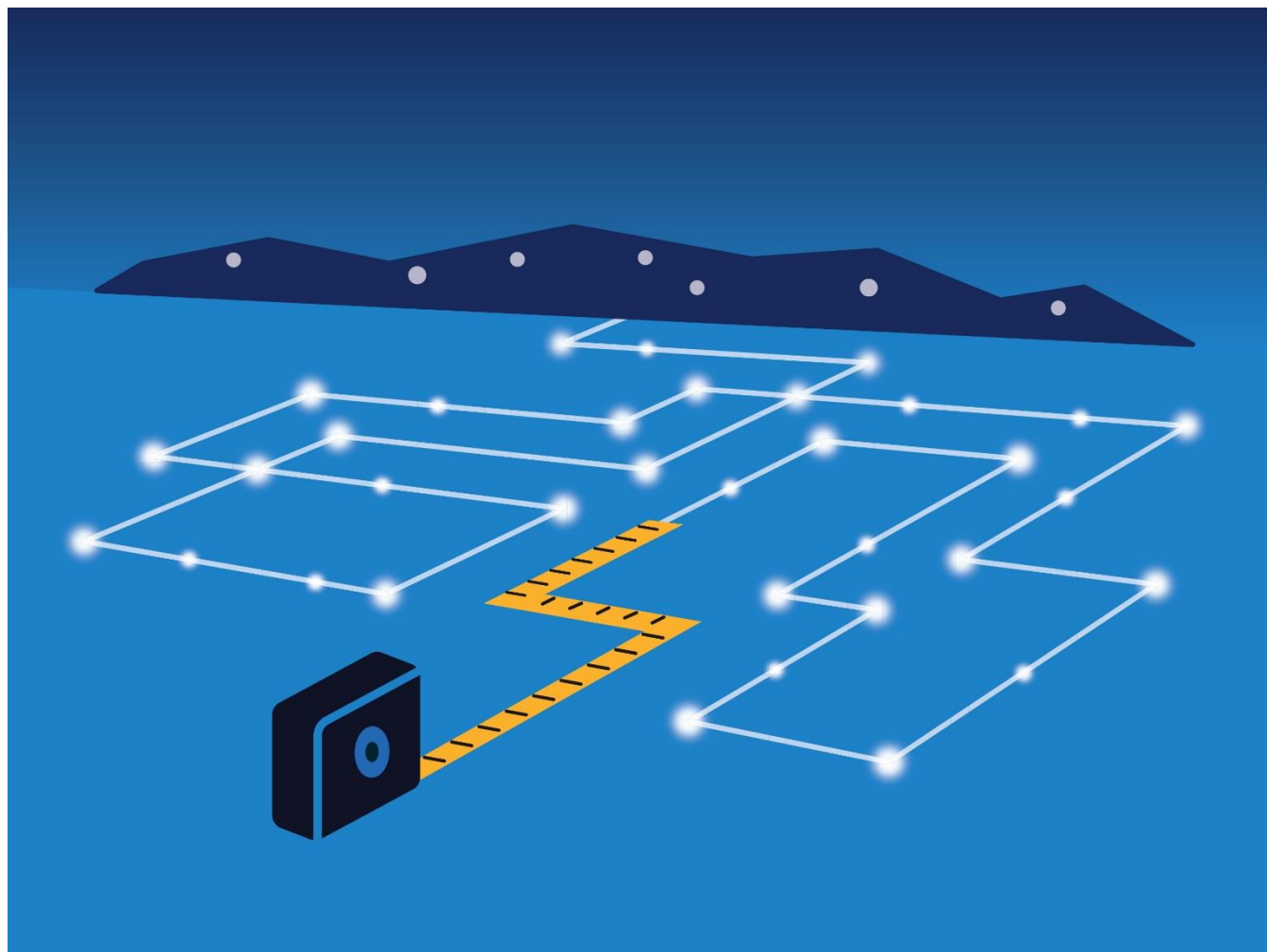


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Impact and Process Evaluation of 2015 (PY8) Ameren Illinois Company ENERGY STAR® New Homes Program

Final

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CADMUS

NAVIGANT



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1. Executive Summary

This report summarizes the evaluation activities and associated findings for the ENERGY STAR® New Homes Program during its eighth year of operation (PY8). During PY8, Leidos Engineering administered the program and CLEAResult implemented it. The program offered builders training, technical information, and financial incentives for the construction of single-family homes and duplexes that achieved a Home Energy Rating System (HERS) index of 65 or lower (a lower HERS index indicates a more efficient home). Participating builders hired a HERS rater to verify savings achieved through energy-efficient practices and equipment. Ameren Illinois Company (AIC) discontinued incentives for newly constructed multifamily properties (i.e., three units or more), during the prior program year (PY7) and ended the ENERGY STAR New Homes Program at the conclusion of PY8 (June 1, 2016).

To assess PY8 performance, the evaluation team conducted in-depth interviews with program staff and participating builders, reviewed building simulation models (REM/Rate) predicting energy savings using specific home characteristics compared to baseline homes, and analyzed the tracking database. Based on AIC's PY8 implementation plan, expected program savings made up 0.1% of the overall PY8 portfolio electric savings and 1.8% of PY8 portfolio natural gas savings.

Program Impacts

Table 1 summarizes the electric and gas savings from the PY8 ENERGY STAR New Homes Program. The evaluation team calculated ex post gross savings by verifying building simulation model runs for participating homes in the program. The program achieved ex ante gross savings of 697 MWh and 62,494 therms and ex post gross savings of 532 MWh and 113,214 therms. As in previous years, compared to planning assumptions, more savings were achieved through gas measures than electricity measures. Ex post gross electric and demand impacts fell short of ex ante planning estimates with realization rates of 76% and 79%, respectively. However, the natural gas realization rate was 181%. While this was due to multiple factors, including home size and changing market conditions, the most important was the high occurrence of gas savings measures applied to gas-heated homes, which increased the ex post savings. In gas-heated homes, over 90% of the energy savings was gas savings. The most common measures applied to gas-heated homes were high efficiency furnaces and tank-less water heaters, both of which offer significant energy savings over federal minimum requirements. In contrast, ex ante savings based on implementer-assumed energy usage¹ and adjusted savings ratios for the 2012 energy code, assumed an equal proportion of gas and electric energy savings within each home. The ex post gross savings were then multiplied by the SAG-approved NTGR of 1.01 to produce the net energy and demand impacts.

¹ Program ex ante energy savings are a deemed savings value based on an assumed energy usage of a HERS 100 home adjusted to the baseline and target HERS score using a percentage reduction of the assumed energy usage values.

Table 1. PY8 ENERGY STAR New Homes Program Net Savings

	Ex Ante Gross	Realization Rate	Ex Post Gross	NTGR	Ex Post Net
Energy Savings (MWh)					
Total MWh	697	0.76	532	1.011	538
Demand Savings (MW)					
Total MW	0.196	0.79	0.154	1.011	0.156
Therms Savings					
Total Therms	62,494	1.81	113,214	1.006	113,893

Note: realization rate = ex post gross savings ÷ ex ante gross savings.

In January 2016, the State of Illinois implemented the 2015 Illinois Energy Conservation Code (IECC), effectively raising the program's baseline. In June 1, 2016, AIC discontinued the program because it was no longer cost-effective given the changes in the home performance baseline to IECC 2015.

Key Findings and Recommendations

The PY8 ENERGY STAR New Homes Program delivered 577 single-family homes, achieving 125% of its goal and a 38% increase over single-family homes completed in PY7. The program also achieved an increase in the number of completed homes that achieved a higher-efficiency HERS rating of 46–55 (62%) compared to PY7 (43%). Of the 577 homes that qualified for program incentives, 107 (18%) achieved ENERGY STAR certification, a slight increase from PY7 (15%). As in PY7, builders continued to report high satisfaction levels with the program. Builders said homebuyers' interest in energy efficiency have increased slightly over the past year, though customers still seldom ask about it.

As noted above, at the end of PY8, AIC decided not to pursue the program in the future. As the evaluation team has seen in other parts of the country, new homes programs must find a balance between ever-increasing building codes and standards and cost-effectively incenting builders to build significantly above the baseline to capture additional energy savings (which can be expensive and difficult for builders to recover in a new home's sale price). Additionally, the intent of the IECC is to require the installation of cost-effective energy upgrades—leaving little room for AIC to incent builders to exceed the IECC.

Despite the ENERGY STAR New Homes Program's discontinuation in PY9, the evaluation team offers the following program conclusions and recommendations to assist AIC if it considers revising and restoring the program in future years.

- **Key Finding #1:** Program incentives alone are not driving builders to build well above the IECC. Rather, it appears to be the incentives in conjunction with the ever more stringent energy codes that are driving builders to reach the higher incentive tiers. Builders typically build new homes with direct venting for heating and water heating equipment because those systems provide greater design flexibility. However, while the equipment is more expensive, the total cost² can be lower than older atmospheric

²Atmospherically vented gas equipment requires a well-designed venting system since it relies on gravity and the lower density of the hot exhaust to properly vent the combustion gasses. While many factors can be considered when builders and architects choose the type of venting systems, the flexibility and simplicity of direct venting systems make these more preferable.

venting systems. Direct venting (and condensing) heating and hot water heating equipment are inherently more fuel efficient than the federal minimum efficiency standards. With the adoption of IECC 2015, most envelope improvement measures that go beyond the code do not prove cost-effective for builders. Nevertheless, incremental efficiency increases in heating and water heating equipment are less expensive than envelope improvements and therefore become attractive measures for meeting program HERS requirements.

- **Recommendation:** Inform builders they can still qualify for Heating and Cooling Program rebates, even though the ENERGY STAR New Homes program is ending. Additionally, as the price of ductless heat pumps decreases and availability becomes more available, explore incentives for these systems, specifically with homebuilders. Multi-zone ductless systems continue to become increasingly popular for efficient homes, especially when the energy code requires a very well-insulated envelope. This means a home's heating demands can become sufficiently low to make high-efficiency ductless systems a viable option.³ Additionally, as builders favor high-efficiency water heating systems, explore this option as a possible addition to existing programs.
- **Key Finding #2:** Cadmus' experience evaluating new homes programs and the AIC builder interviews found that homebuyers do not make purchasing decisions based on energy efficiency since they do not perceive the added value of program-homes and assume all new homes are energy-efficient. Builders need AIC's support to educate the public and distinguish the value of their program homes.
- **Recommendation:** Should the program become cost effective in the future, increase program advertising and consider developing public education and awareness programs that encourage home buyers to look for and ask about energy efficiency features beyond ENERGY STAR appliances.

³ <http://www.greenbuildingadvisor.com/blogs/dept/musings/just-two-minisplits-heat-and-cool-whole-house>

2. Evaluation Approach

The PY8 assessment of the ENERGY STAR New Homes Program included process and impact analyses.

2.1 Research Objectives

The PY8 ENERGY STAR New Homes Program evaluation primarily sought to estimate ex post gross and net energy and demand savings associated with the program. The evaluation team investigated program changes, program progress, and participating homebuilders' interactions with the program. The team designed the evaluation to answer the following questions:

2.1.1 Impact Questions

- How many homes were built to program standards in PY8?
- What was the appropriate baseline for estimating program savings?
- What was the program's estimated net-to-gross ratio (NTGR) for future planning purposes?

2.1.2 Process Questions

- What program changes occurred in PY8? What were the impacts from those changes?
- How well did program processes work?
- What motivated builders to participate in the program?
- What were the barriers to increased builder participation?
- How satisfied were builders with the program?
- With the program ending, are there next steps to help transition the market and the builders participating in the program?

2.2 Evaluation Tasks

Table 2 summarizes PY8 evaluation activities conducted for the ENERGY STAR New Homes Program.

Table 2. PY8 ENERGY STAR New Homes Evaluation Methods

Activity	PY8 Process	PY8 Impact	Forward Looking	Details
Program Staff Interviews	✓		✓	One interview with Leidos, AIC's program administrator, and one with CLEAResult, the program implementer, to discuss program design, implementation, marketing, and market trends.
Materials and Data Review	✓			Review of the program brochures and database.
Participating Builder Surveys	✓		✓	Assess builder participation and satisfaction, and to collect NTGR data for prospective use.

Activity	PY8 Process	PY8 Impact	Forward Looking	Details
REM/Rate File Review/ Simulations		✓		Reviewing REM/Rate project files and running simulations to verify savings for each as-built home against an appropriate PY8 baseline for each jurisdiction.

2.2.1 Program Staff In-Depth Interviews

The evaluation team conducted two interviews with program staff: one with AIC's program administrator and one with the program implementer. These interviews explored questions regarding the program's design, implementation, communication, and customer feedback. The team also inquired about data tracking related to the program.

2.2.2 Review of Program Materials and Data

The evaluation team reviewed the program-tracking database (updated August 25, 2016), residential energy efficiency brochures for customers (which included information on the ENERGY STAR New Homes Program), and a PDF advertisement promoting AIC's energy efficiency programs to a homebuilders' association.

2.2.3 Participating Builder Surveys

The evaluation team conducted surveys with participating builders that constructed homes within AIC's service territory during 2015, covering parts of PY7 and PY8 (as shown in Table 3). The team conducted interviews with these builders to assess their views of the program and to determine the program's influences on them. Builder interviews covered topics such as program requirements, motivations to participate, program satisfaction, building practices, program processes, free-ridership, and spillover. Of 13 completed surveys, nine builders were active during PY7 and PY8, and four were active only during PY7.

Table 3. Summary of Survey Response Rates

Activity	Number in Sample	Number in Sample Attempted to Contact	Refused/ Bad Number	Quota	Interviews Completed	Overall Response Rate ^b
Survey Participant Homebuilders ^a	72	72	28	20	13	29%

^a The evaluation team conducted participant builder surveys in February 2016, utilizing a list of active PY7 participants, provided by program implementation staff.

^b The number of completed interviews divided by the number of individuals the team attempted to contact (up to four times).

2.2.4 REM/Rate File Review

In past evaluations, the evaluation team reviewed a sample of 70 REM/Rate files. For PY8, the team developed a Microsoft Access tool to gather information from the REM/Rate files automatically; this enabled the team to review nearly a census of REM/Rate files submitted to the program. The team requested all REM/Rate files submitted to the program for PY8. We received 566 REM/Rate files (out of 577 included in the program database) and attempting to match those files to participants in the program tracking database using the project ID and home address. Table 4 shows the results.

Table 4. REM/Rate Analysis Sample

Activity	Number in Population	Attempted Sample Size	Unable to Match Participant ID's	Excluded for Address Errors	Included in Final Analysis	Sample Percentage
REM/Rate Analysis	577	566	31	31	504	87%

Of the 566 files, 504 conclusively matched the database using home addresses and participant IDs. An additional 31 files matched project IDs, but had incorrect addresses. Due to the overwhelming majority of files so closely matching, the team excluded those with data inconsistencies (e.g., incorrect addresses) from the analysis. The realization rates determined from the 504 analyzed homes were applied to the population of the entire program.

2.2.5 Impact Analysis

Gross Impacts

The evaluation team first reviewed the program tracking database for several errors, including duplicate entries, inconsistent savings, and miscategorized measures. The team then compiled details from each home in the sampled REM/Rate files and compared the results to home characteristics and HERS index information in the tracking database to ensure consistency. The team performed energy simulations for each home against local code and federal standards using the User Defined Reference Home feature in REM/Rate for each of the 504 homes. The team developed a set of baseline home characteristics representing the minimum energy code and federal appliance requirements. Given those characteristics, REM/Rate is able to automatically run two energy simulations for each home. The first simulation represented the energy usage of the home as recorded by the HERS Rater and the second represented the energy usage of the home using the characteristics of the current energy code requirements. This analysis produced gross realization rates which the team applied to remaining homes in the tracking database.

Net Impacts

The team applied NTGRs (approved by the SAG) to PY8 program savings. Table 5 summarizes NTGRs used in the net impact analysis.

Table 5. SAG-Approved PY8 NTGRs

Measure Description	Electric NTGR	Gas NTGR
Single-family only	1.011	1.006

2.3 Sources and Mitigation of Error

Table 6 summarizes possible error sources associated with data collection conducted for the ENERGY STAR New Homes Program. Detailed discussions of each item follow.

Table 6. Possible Error Sources

Research Task	Survey Error		Non-Survey Error
	Sampling Error	Non-Sampling Error	
Builder Surveys	N/A, census attempt	<ul style="list-style-type: none"> • Measurement error • Nonresponse 	
Gross Impact Calculations (REM/Rate file review)	N/A	N/A	<ul style="list-style-type: none"> • Data processing error
Net Impact Calculations	N/A	N/A	<ul style="list-style-type: none"> • Data processing error

Throughout the PY8 evaluation’s planning and implementation process, the evaluation team took a number of steps to mitigate potential sources of error. To minimize data processing errors, different evaluation team members reviewed all calculations to verify their accuracy.

Survey Error

■ Sampling Errors

- The team attempted to contact all builders on the list and review all REM/Rate files received, which resulted in no sampling error.

■ Non-Sampling Error

- **Non-Response Bias:** Given a 29% response rate for builder surveys, potential existed for non-response bias. The team, however, attempted to mitigate this possible bias by trying to contact each builder in the sample up to four times (unless receiving a hard refusal or all available contact information proved invalid), calling at different times of the day, as appropriate. Based on our analysis of builder characteristics, we expect potential bias to be minimal. Responding builders averaged 8.1 homes built in the past year, compared to the non-responding builders who built an average of 8.3 homes. Responding builders built slightly higher efficiency homes, averaging a HERS Index of 51.6 compared to non-responding builders averaging a HERS Index of 54.2.

Non-Survey Error

■ Data Processing Errors

- **Gross Impact Calculations:** To minimize data processing errors, the evaluation team had all calculations reviewed by a team member who did not perform the original calculations to verify computation accuracy.
- **Net Impact Calculations:** To estimate the program’s net impacts, the team applied deemed NTGRs to the gross impact calculations. For prospective NTG research, the team followed free-ridership and spillover calculation methods provided in the Illinois Statewide TRM (IL-TRM) Version 5.0. These methods have been designed to help evaluators understand the program’s influence on builders to achieve program efficiency levels for homes within and outside the program.

3. Detailed Evaluation Findings

3.1 Program Description

In PY8, the AIC ENERGY STAR New Homes Program offered builders training, technical information, and financial incentives for the construction of single-family homes and duplexes that achieved a Home Energy Rating System (HERS) index of 65 or lower. Homes meeting ENERGY STAR 3.0 standards and achieving a HERS index of 65 or lower were eligible to receive additional incentives. Homebuilders constructing single-family homes and duplexes using AIC-provided fuel for heat qualified to participate in the program. Builders hired a HERS rater to verify savings achieved by energy-efficient practices and equipment and, as needed, provided technical assistance about energy-efficient practices. Typically, HERS raters completed program applications for the builder and interacted with the program implementer on the project's status.

Additionally, through a tiered incentive structure, the program defrayed the costs of hiring HERS raters and contributed to covering expenses and time required to install higher-efficiency measures. In PY7, AIC discontinued incentives for multifamily units, but, for PY8, single-family incentives and HERS rating requirements did not change from PY7. At PY8's conclusion, AIC discontinued the ENERGY STAR New Homes Program.

Table 7 details incentives and associated tiers offered through the program during PY8. ENERGY STAR certified homes received higher incentives because in addition to achieving the ENERGY STAR HERS Index Target, they must also complete five mandatory requirements including:

- Rater design review checklist
- Rater field checklist
- HVAC design report
- HVAC commissioning checklist
- Water Management System builder requirements

By completing these five steps, in addition to achieving the ENERGY STAR HERS Index Target and achieving the ENERGY STAR certification, homeowners are assured their new homes have undergone a process of independent third-party inspections and testing to guarantee a high level of energy performance and meet the Environmental Protection Agency's strict energy efficiency requirements.

Table 7. PY8 ENERGY STAR New Homes Program Incentive Structure

Tier	Heat Provider	PY8	
		HERS Rated	ENERGY STAR Rated
Base Incentive (HERS Rating 56-65)	A/C Gas Heat	\$500	\$600
	A/C Electric Service other Gas Provider	\$500	\$600
	A/C Gas and Electric Heat	\$800	\$1,000
	A/C Electric Heat	\$800	\$1,000
Tier II (HERS Rating 46-55)	A/C Gas Heat	\$1,000	\$1,200
	A/C Electric Service other Gas Provider	\$1,000	\$1,200
	A/C Gas and Electric Heat	\$1,600	\$2,000
	A/C Electric Heat	\$1,600	\$2,000
Tier III (HERS Rating 0-45)	A/C Gas Heat	\$1,500	\$1,800
	A/C Electric Service other Gas Provider	\$1,500	\$1,800
	A/C Gas and Electric Heat	\$2,400	\$3,000
	A/C Electric Heat	\$2,400	\$3,000

3.2 Process Findings

3.2.1 Program Performance

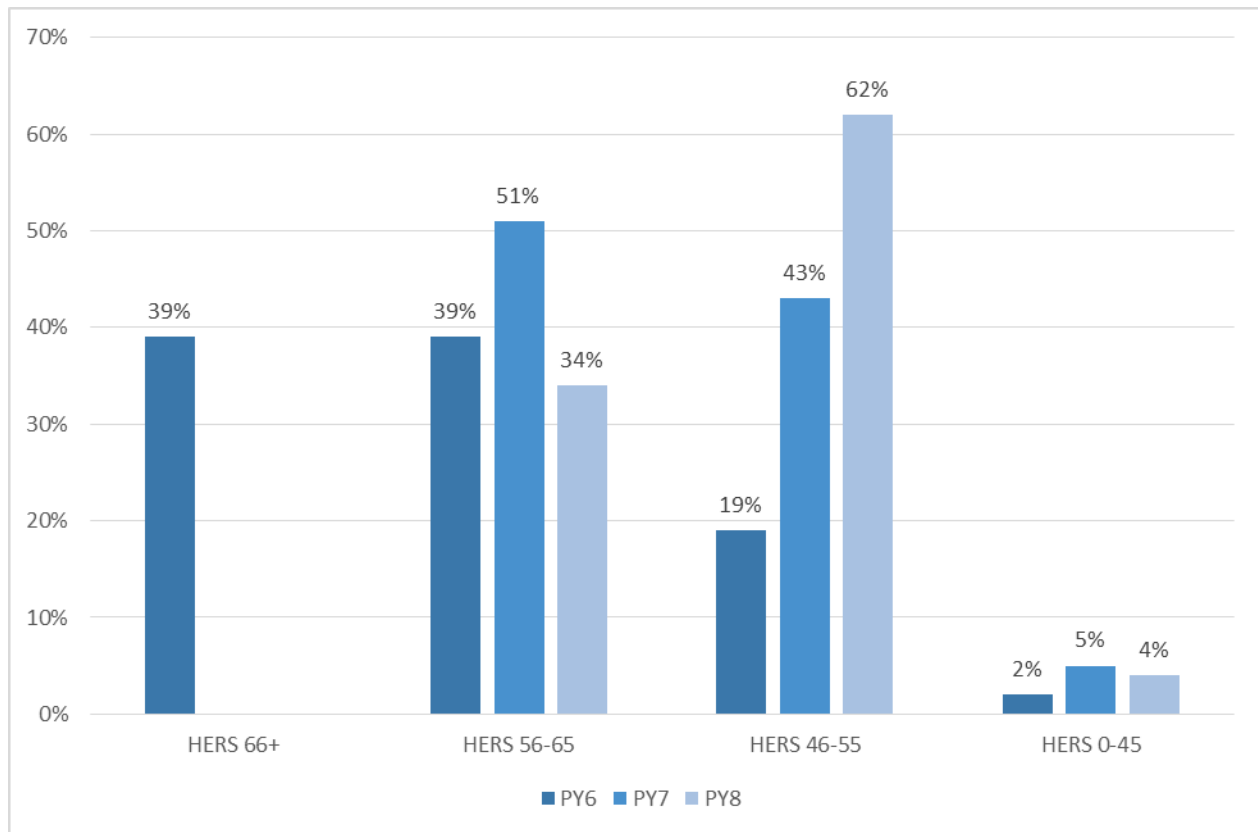
In PY8, the ENERGY STAR New Homes Program started with an original participation goal of 420 homes. After a midyear program review to realign program goals with participation expectations, the program administrator revised the goal upwards to 462. In PY8, the program exceeded the extended target with 70 participating builders completing 577 program-eligible, single-family homes. This represented a 38% increase in completed single-family homes when compared to PY7 data (417 single-family homes) and a 5% increase in completed program homes overall. Table 8 compares actual participation to the corresponding goals for PY7 and PY8.

Table 8. Historical Program Participation

Program Year	Home Type	Goal (Number of Homes)	Actual (Number of Homes)	Percentage Achieved
PY7	Single-family & multifamily	420	547	130%
PY8	Single-family only	462	577	125%

As shown in Figure 1, about one-third (34%) of completed PY8 homes achieved a HERS index of 56 to 65, with 65 as the maximum rating allowed to receive a program incentive. While homes in the lower-efficiency HERS range of 56 to 65 decreased between PY7 and PY8, the program achieved an increase in the number of completed homes attaining a higher efficiency HERS rating of 46 to 55 (62% in PY8 compared to 43% in PY7).

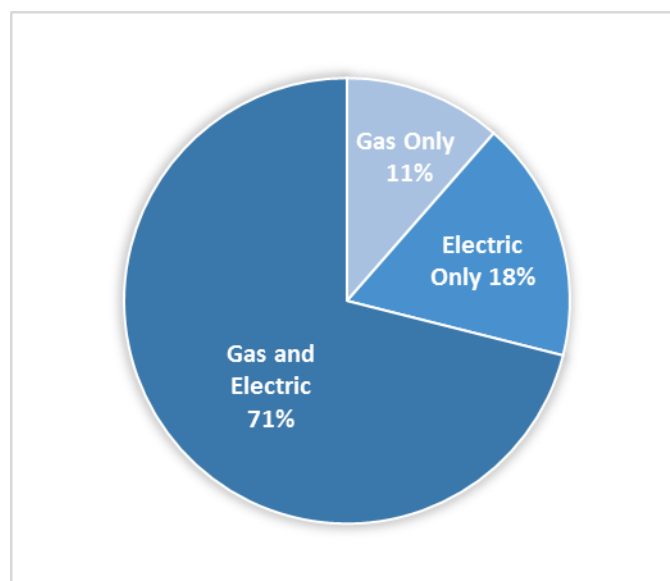
Figure 1. HERS Indices of Historical Program Homes (PY6 (n=302), PY7 (n=547), PY8 (n=577))



Note: In PY7 and PY8, homes with a HERS score greater than 65 were not eligible for program incentives.

As shown in Figure 2, AIC served as the gas and electric provider for the majority of program homes (71%).

Figure 2. PY8 Program Homes AIC Services(n=577)



3.2.2 Program Status

The program administrator described changes occurring during PY8, beginning with a program redesign in November 2015. To improve cost-effectiveness, program staff took the following actions:

- Promoted air-source heat pumps to drive more electrical savings
- Moved program funding from administrative tasks to incentives to capture more energy savings without increasing the overall program budget
- Placed more responsibility on the builders to drive the program
- Adjusted deemed ex ante gas and electric savings for each home relative to previous years. More detail is found in Table 15 Section 3.3.1

Program staff reported cost-effectiveness as the primary challenge facing the program, given the increasing baselines for new homes in Illinois.

The 2015 Illinois Energy Conservation Code took effect for homes permitted on or after January 1, 2016. The program implementer explained that amendments made by the State of Illinois resulted in the 2015 energy code essentially equaling the 2012 energy code in terms of energy use, except for adding the Energy Rating Index (ERI)⁴ path as a code compliance option. As a result, the User Defined Reference Home (UDRH) used to assess energy savings did not change. While the program was in progress when the energy code changed, PY8 homes would not have been affected as they received building permits before the code change.

3.2.3 Market Performance

Program staff said they continued to see consistent growth in the new housing market in PY8, estimating the program's share approached 15% (compared to 12% in PY7). As in past years, a shortage of HERS raters continued, although the program implementer brought three new raters into the program in PY8, for a total of 10 raters.

Eight builders accounted for 50% of the program's homes in PY8, compared to five builders in PY7.

3.2.4 Program Communication

In PY7, the evaluation team found the availability of qualified HVAC contractors limited builders' ability to use the ENERGY STAR option to certify homes for the program. Raters reported only three certified contractors served the central Illinois area, limiting their ability to certify homes. Contractors sporadically participated and they exhibited poor follow through for paperwork required for ENERGY STAR-certified homes. The team

⁴ Daggers, Steve. International Code Council News Release-2015 IECC Adoption, Compliance Make New U.S. Homes More Energy Efficient, July 13, 2015. The ERI is a numerical value based on a scale of 0-100; for example, a home using no net purchased energy has an index value of zero. Using HERS rating is the existing compliant ERI method, nationally recognized for inspecting and calculating a home's energy performance.

recommended that program staff offer special training on ENERGY STAR to HVAC contractors to help increase the pool of qualified contractors.

Program staff acknowledged the program's difficulty in attracting HVAC contractors. In PY8, the program implementer began streamlining the collection of paperwork and waited to determine if that affected HVAC contractors' willingness to participate. In a follow-up discussion to the original interviews between the evaluation team and the program implementer, the program implementer reported not seeing noticeable impacts on HVAC contractors' willingness to participate, and several builders shifted their focus away from achieving ENERGY STAR qualification to achieving better performance on the HERS Index. The program implementer added that, during PY8, only builders with established relationships with participating HVAC contractors completed a significant volume of ENERGY STAR-certified homes. In PY8, 18% of total program homes were ENERGY STAR certified.

In PY8, the program implementer also added a new northern account manager to improve communications with raters, who in turn communicated with builders. Staff also began developing a portal to allow raters to submit program applications and track their projects throughout the program process. Staff also offered a quarterly newsletter to provide information to the home contractors more frequently.

To further improve the relationship with raters, the program recognized three raters (out of 10) with the most program production volume, paying their registration fees and hotel costs to attend the 2016 RESNET conference. Attending the RESNET conference helped raters satisfy continuing education requirements.

3.2.5 Program Processes

Marketing

As in years past, program marketing was limited to the program implementer attending home shows and advertising with homebuilder associations to avoid oversubscribing to the program.

Data Tracking

Historically, program staff used a Microsoft Excel spreadsheet to track program data. Beginning in December 2015, all new projects were entered into the program implementer's new relational database. As part of this switch, the program implementer planned to open a new construction portal to allow builders and raters to track the status of their projects in real-time. Follow-up conversations reported, however, that the program administrator decided in spring 2016 that all projects would be entered into the administrator's database system for PY9, rather than continuing data entry into the implementer's database. Consequently, the implementer abandoned further development of their database. A program ally portal had been neither fully completed nor approved for implementation before the program's cancellation.

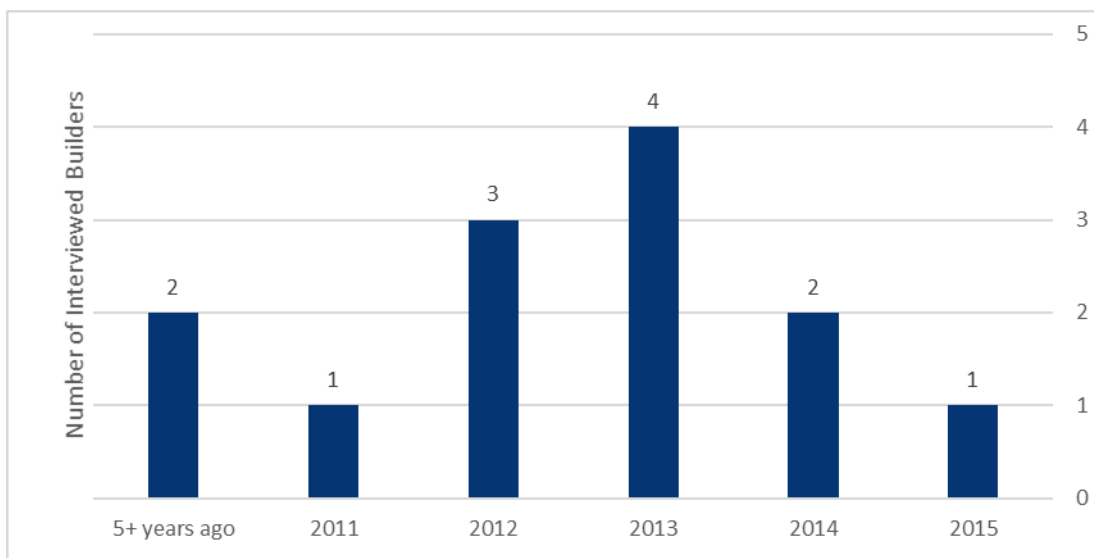
Verification Process

Program staff, said in previous years they relied on RESNET procedures to ensure raters performed their quality assurance inspections and assessments of project homes. In PY8, the program implementer increased their quality assurance procedures by sending account managers into the field to inspect six houses every one to two weeks to make sure that the raters performed quality assurance steps and that their actions followed the correct timing and sequence for home inspections.

3.2.6 Builder Feedback

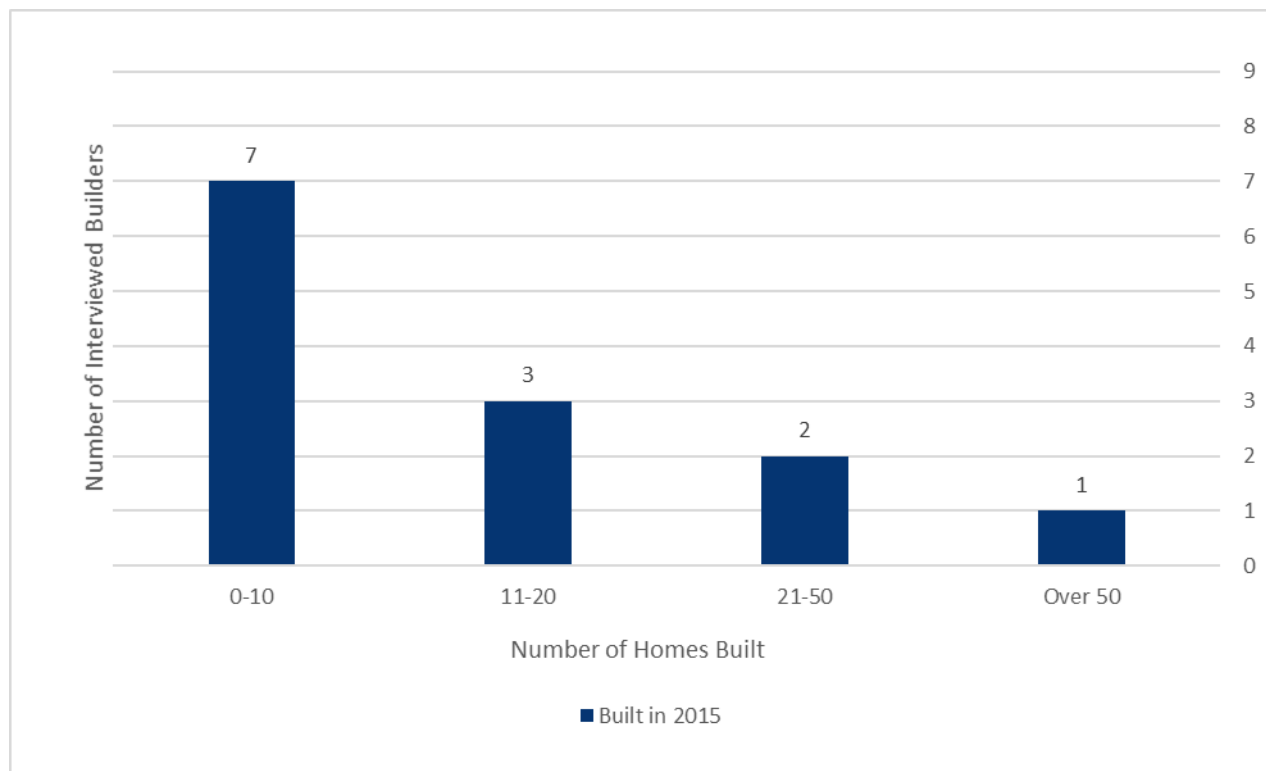
The evaluation team surveyed 13 participant builders within AIC service territory. Though the team sought to interview builders who joined the program at different times, the builder sample file did not contain this information. Hence, the team relied on self-report data to categorize participation start years. Figure 3 shows the approximate program year that each interviewed builder joined the program.

Figure 3. When Participant Builders Joined the Program



Q3. When did you first join the program? (n=13)

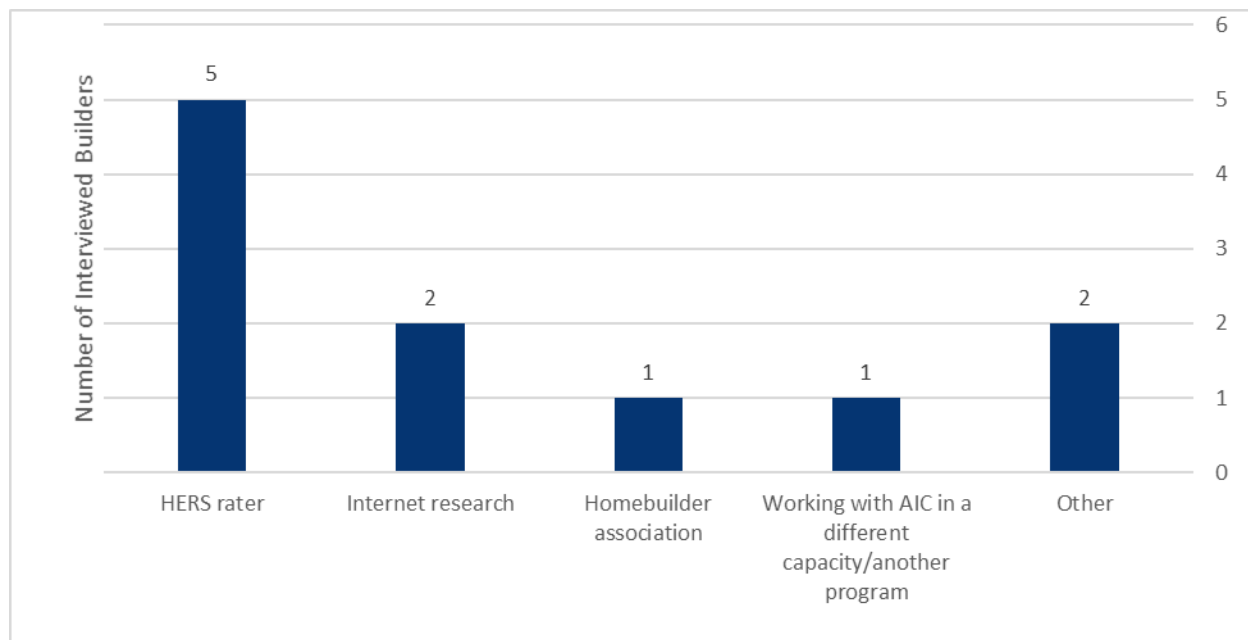
The evaluation team also gathered information about the type and quantity of homes that participant builders constructed in 2015 as well as the percentage of these homes built within AIC's service territory. Of 13 builders interviewed, nine only built single-family homes, three built multifamily and single-family homes, and one only built multifamily homes. As shown in Figure 4, most builders built 10 or fewer homes in 2015. Six builders stated that they constructed all their homes within AIC's service territory, five builders stated that they built over half their homes in AIC's service territory, and two builders stated that they built less than half their homes in AIC's service territory. Builders also stated that all single-family homes that they constructed in AIC's service territory qualified for the ENERGY STAR New Homes Program.

Figure 4. Number of Homes Built by Participating Builders

Q5: During 2015, about how many homes did you build? (n=13); Q6: For the year 2015, about what percent of these homes are built in Ameren Illinois territory, which covers central and southern Illinois? (n=13) – Homes built in Ameren Illinois territory calculated from responses to Q6

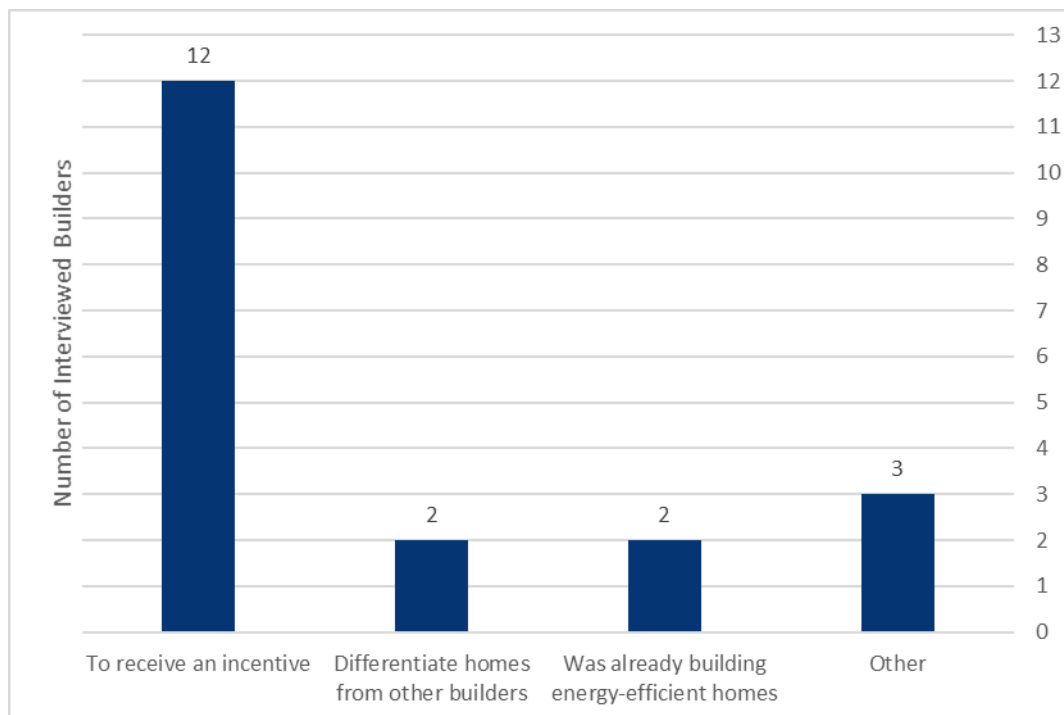
Builder Awareness and Reasons for Participation

Participant builders most commonly learned of the program through a HERS rater or through Internet research. None of the builders learned about the program through customer inquiries. Figure 5 shows ways that participant builders learned about the program. The two “other” responses included learning about the program from a contact at the ENERGY STAR Program and from Absolute Green (an organization that processes builders’ ENERGY STAR Program paperwork).

Figure 5. How Participant Builders Learned About the Program

Q8. How did you first learn about the Ameren Illinois program? (n=11)

Though builders cited a variety of reasons for joining the program, they most commonly wanted to receive a financial incentive, as shown in Figure 6. Builders also said they joined the program to differentiate themselves from other builders or because they already built efficient homes. “Other” responses included complying with code, gaining publicity as an efficient builder, and passing energy savings on to homebuyers. One builder explained that the State implemented new building standards without providing builders with incentives to achieve the higher standards. The ENERGY STAR New Homes Program incentives made building to higher standards “more tolerable.”

Figure 6. Why Builders Joined the Program

Q9. What were the reasons you decided to participate? (n=13, multiple responses allowed)

Program Design

As in PY7, builders in PY8 reported shortages of ENERGY STAR-certified HVAC contractors to complete the ENERGY STAR 3.0 HVAC checklist, saying the contractors' availability did not change over the last year. Two builders said this shortage meant they could not achieve ENERGY STAR certifications for their homes, and one contractor said the shortage affected his price for an ENERGY STAR home.

The evaluation team also asked builders about impacts of new HERS program requirements implemented during PY7, which lowered HERS scores required for different incentive payments. Seven (out of 11) builders reported no changes in their building practices. Of three builders who reported an effect from the change, all added extra insulation to their homes and one began sealing ductwork to meet program requirements.

A majority of builders (eight of 12) said the incentive increase occurring between PY6 and PY7 did not affect how they built their homes. Three builders said the higher incentives allowed them to add air seals, increase insulation, focus on air filtration issues, and upgrade HVAC equipment. One builder said the increase further encouraged him to participate in the program. Appendix A provides more detail on the program's influence on builder behaviors (in the Free-ridership and Spillover section).

Homebuyer Interest in Energy Efficiency

Builders said few homebuyers were familiar with the ENERGY STAR New Homes Program. As shown in Table 9, only two builders thought at least half of their buyers knew of the program before visiting the builder. Most responding builders (eight of 12) said far fewer homebuyers (between 0% and 10%) knew of the program before visiting the builder.

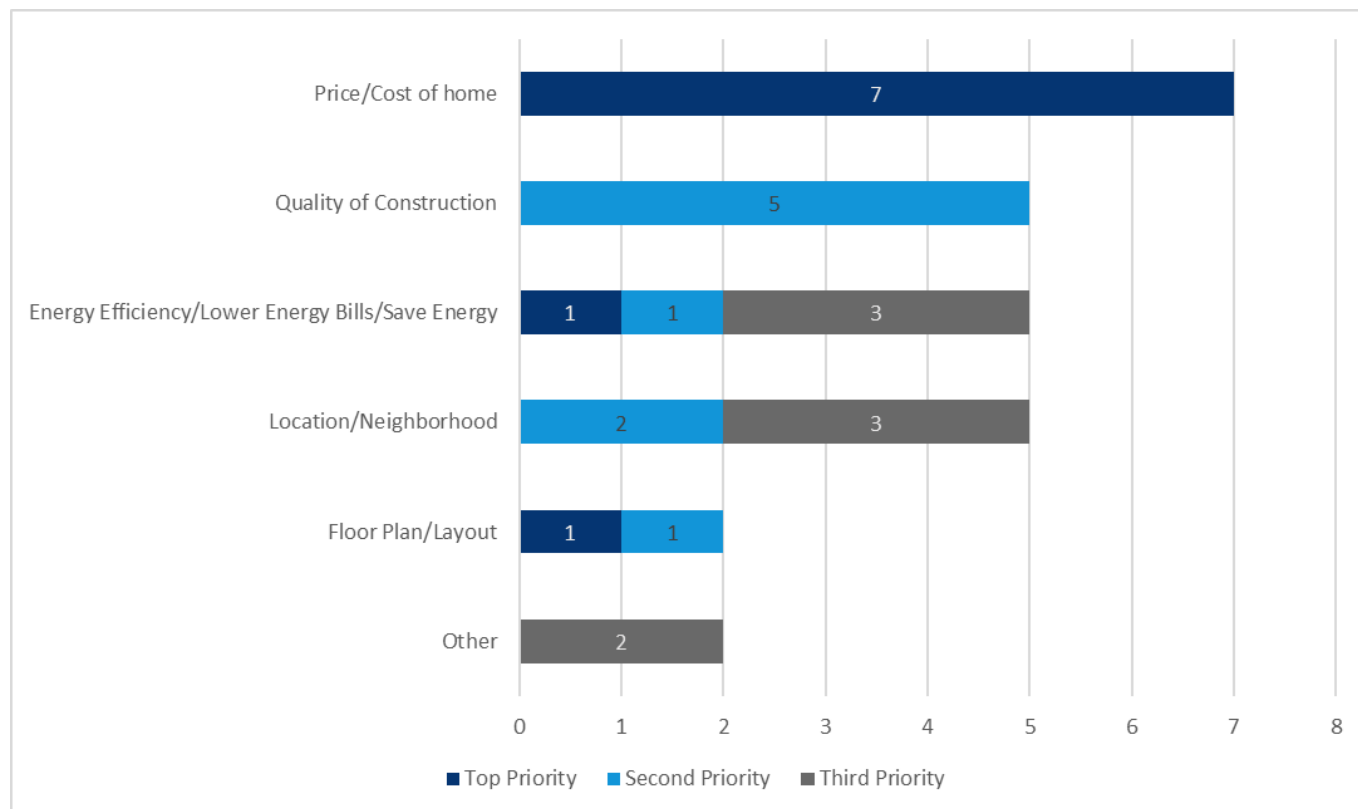
Table 9. Percent of Homebuyers Familiar with the ENERGY STAR New Homes Program

	0%	5%	10%	30%	50%
Responses	4	1	3	2	2

Q36: About what percentage of homebuyers would you say are familiar with the ENERGY STAR New Homes Program before they visit with you? (n=12)

Builders also perceived relatively low homebuyer interest in energy efficiency. Eight of 10 responding builders said homebuyers rarely (if at all) ask about energy efficiency when visiting their model homes. Two builders said homebuyers occasionally asked about energy efficiency.

Despite buyers' reported low interest in energy efficiency, seven of 12 builders who offered to gauge customer interest reported that customer interest increased over the last year, and five builders reported customer interest did not change. Builders told the evaluation team that homebuyers made the home's cost their top priority, followed by construction quality, energy efficiency, and location. Figure 7 shows builders' perceptions of homebuyers' purchase priorities.

Figure 7. Perceived Top Homebuyer Home Purchase Priorities

Q39: In order of importance from most important to less important, what are the top three priorities of your homebuyers when purchasing a new home from you? (n=9) – one respondent did not provide a third priority

Builder Satisfaction

Builders expressed strong satisfaction levels with the program. Of 13 builders interviewed, all said they were either very satisfied (nine builders) or somewhat satisfied (four builders) with the program. The evaluation

team asked builders what they thought worked well about the program. Of nine builders offering observations, five builders praised their HERS raters, saying they were great to work with, knew the program well, and took care of paperwork, which made the process simple and efficient for builders. All 13 builders were very satisfied (nine builders) or somewhat satisfied (four builders) with rater communications, and eight builders noted that rater communications improved over the last year. The remaining five builders said rater communications remained unchanged.

The evaluation team also asked builders to identify program aspects that could have improved. Of 13 builders, nine offered suggestions addressing an array of topics. Three suggestions focused on educating the public and homebuyers about energy efficiency, and two suggestions focused on increasing incentives. Other suggested program improvements included expanding the builder network, sharing program information more frequently, ensuring that program design considered code requirements, increasing publicity for builder participation, and reducing paperwork required by the program.

Regarding the recommendation that program design should consider building code requirements, one builder elaborated, saying: “Building codes required us to increase the insulation of our buildings and bring in extra air (we use high-efficiency heat pumps). That caused us to get marked down. We received a lower incentive because of it, and there was nothing we could do about it.”

Builder Training and Communication

Five of 13 builders said they received training about the program, although they exhibited limited recollection of training event details. Three recalled receiving training on changing energy codes, general energy efficiency, and general program information. Two builders recalled HERS raters providing program updates, and one builder recalled attending a seminar on changing energy codes, provided by a local homebuilders’ association.

While builders recalled limited details about the training content, they generally expressed satisfaction with training. Four builders said they were very satisfied, and three said they were somewhat satisfied. Two builders offered recommendations for improved trainings:

- Increasing the availability and frequency of trainings
- Offering seminars on products that help builders exceed building codes
- Providing more consistent updates on the meaning of changed HERS scores

Most builders (nine of 12), expressed satisfaction with communication they received from program staff about the program or their projects. Six of 12 builders said communications from program staff improved over the last year, while four said communication remained unchanged. One builder noted that staff used to be unresponsive about incentive processing but their responsiveness improved

Three builders, however, reported not being too satisfied or not at all satisfied. Two noted that program staff communications became worse during the last year, and one noted that communications were confusing as

the builder worked with the program implementer rather than directly with AIC. When this builder directed a question towards AIC, AIC redirected questions and communications to the implementer.⁵

When asked how program staff communications could improve, seven builders thought improvement unnecessary; four builders offered the following recommendations:

- Call builders at least once per year in addition to generic e-mails builders received “once in a while”
- Provide more frequent communications; update builders about program changes three times per year (this builder also remarked that “we hardly ever hear from Ameren currently”)
- Have AIC staff visit the sites to “see how it is going” and “answer questions”

3.3 Impact Assessment

The evaluation team verified participating homes and ex ante savings estimates by reviewing energy analysis models of 504 participating homes in the tracking database. The team verified that the model used input values consistent with identifying information in the tracking database and that HERS ratings levels matched model outputs.⁶ Further, the team verified that participants in the sample frame were correctly categorized by HERS index, incentive level, and building type. We identified several inconsistencies between REM/Rate files and the fuel types recorded in the tracking database. Table 10 shows that six homes were incorrectly classified as using gas and electric service while two homes were incorrectly classified as using electric heating systems.

Table 10. Database Inconsistencies

Inconsistency Found	Action Applied	Number of Instances
Home tracked as a gas and electric home; however, REM/Rate file detailed an electric heating and domestic hot water system	Reclassified as homes with electric heating systems	6
Home tracked as having an electric heating system; however, REM/Rate file detailed a natural gas fired heating system	Reclassified as homes with gas heating systems	2
Total Number of Inconsistencies		8

As shown in Table 11, the team compared the number of participating homes (by rating type and fuel type) to REM/Rate files. While we verified all 577 homes, some of the homes were incorrectly classified.

⁵ The evaluation team recognizes that builders are supposed to directly contact the program implementer, not AIC.

⁶ Neither the program implementer nor AIC used the REM/Rate files to develop savings.

Table 11. Verified Participants

Rating Type	Fuel Type	Tier	Tracking Participants	Verified Participants	Verification Rate
ENERGY STAR	Electric Heat	Tier I	25	28	112%
		Tier II	8	9	113%
		Tier III	2	2	100%
	AIC Electric Service	Tier I	5	5	100%
		Tier II	16	16	100%
		Tier III	2	2	100%
	AIC Gas Heat and Electric Service	Tier I	7	4	57%
		Tier II	21	20	95%
		Tier III	2	2	100%
	AIC Gas Service Only	Tier I	18	18	100%
		Tier II	1	1	100%
HERS	Electric Heat	Tier I	1	1	100%
		Tier II	4	4	100% ^a
		Tier III	8	8	100% ^a
	AIC Electric Service	Tier I	4	4	100%
		Tier II	22	21	95%
		Tier III	1	1	100%
	AIC Gas Heat and Electric Service	Tier I	112	112	100% ^a
		Tier II	262	263	100%
		Tier III	9	9	100%
	AIC Gas Service Only	Tier I	25	25	100%
		Tier II	22	22	100%
Totals			577	577	100% ^b

^a The total number of verified participants is 100%, one home was removed from the category and one was added to this category

^b While the total number of verified participants is 100%, 6 of those were not correctly classified according to the tracking data and energy models resulting in a 99% overall verification rate.

3.3.1 Gross Impacts

Baseline Characterization

Typical for new construction programs and outlined in the IL-TRM V4.0, the building code and federal standard serve as the baseline condition. In recent years, Illinois quickly adopted the newest IECC codes after publication. As shown in Table 12, the newest IECC 2015 code was adopted as of January 1, 2016.

Table 12. Residential Code History in Illinois

2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
IECC 2006		IECC 2009			IECC 2012			IECC 2015		

This update to the energy code did not affect program participants in PY8, given the time elapsed between a builder pulling a permit for a home and the date that they complete the home and submit to the program. In

effect, a home must be built to the energy code at the time of permit approval. As homes typically take more than six months for completion, a home finished at the end of the program year would have its permits issued before Jan 1, 2016. For all homes completed in PY8, the team used IECC 2012 as the baseline energy code.

The IECC 2012 baseline was used to calculate energy savings from REM/Rate models utilizing the User Defined Reference Home (UDRH) feature of REM/Rate. For each of the 504 homes, the features detailed below in Table 13 were modified by REM/Rate to create a baseline model for each of the participant homes. The baseline home is the same size and shape as the participant home but uses the minimum requirements of IECC 2012 and current federal standards.

Table 13. Baseline Home Characteristics

Component	IECC 2012 Zone 4	IECC 2012 Zone 5
Thermostat	Heating 72F Cooling 75F Programmable Thermostat	Heating 72F Cooling 75F Programmable Thermostat
Ceiling	U-0.026	U-0.026
Walls	U-0.057	U-0.057
Floors	U-0.033	U-0.033
Slab	R-10, 2ft	R-10, 2ft
Windows	U-0.35	U-0.32
Infiltration	5ACH50	5ACH50
Duct Leakage	4CFM/100CFA	4CFM/100CFA
Duct Insulation	R-8 Attic Supply, R-6 Otherwise	R-8 Attic Supply, R-6 Otherwise
Heat Pump	8.2 HSPF 14 SEER	8.2 HSPF 14 SEER
Furnace	80 AFUE	80 AFUE
Boiler	82 AFUE	82 AFUE
AC	13 SEER	13 SEER
Lighting	75% CFL	75% CFL
Appliances	RESNET Default	RESNET Default
Gas Water Heat	0.59 EF	0.59 EF
Electric Water Heat	0.91 EF	0.91 EF

Modeling Results

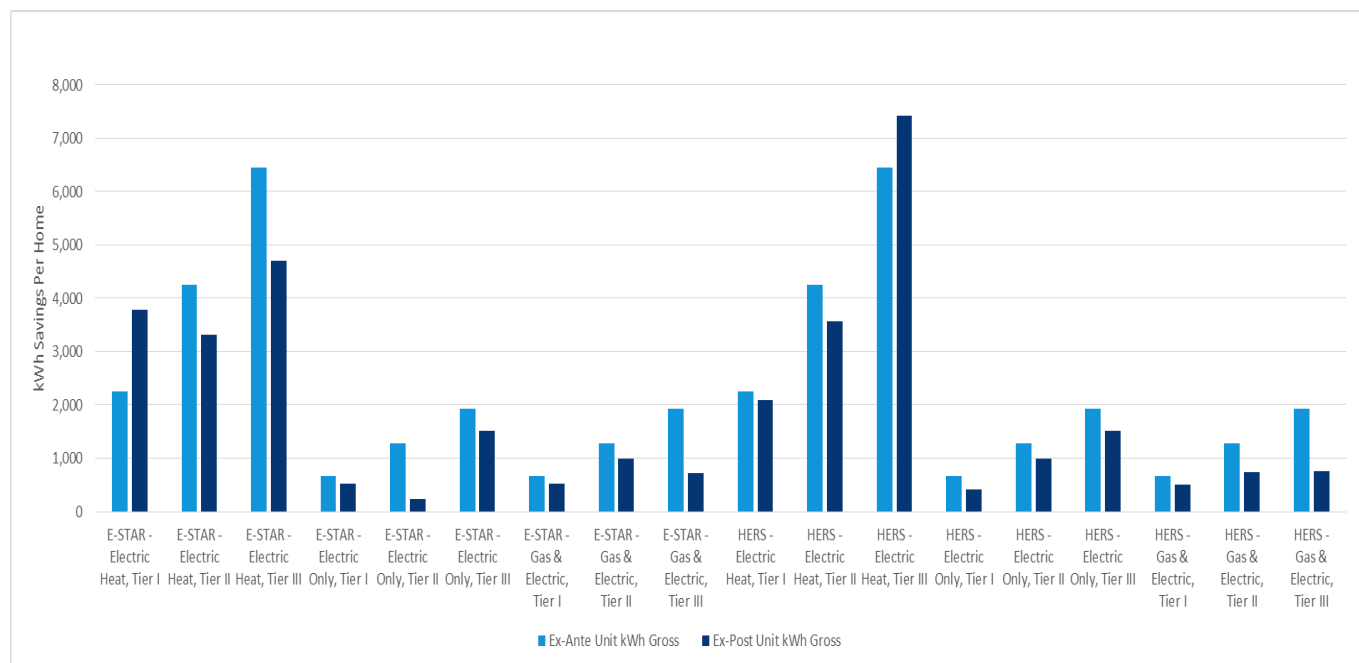
Of 577 homes in the PY8 program population, the REM/Rate analysis included 504, representing 87% of the program population.

The evaluation team requested all REM/Rate files submitted to the program for PY8, and received a total of 566 REM/Rate files (i.e., of 577 in the program database). The team attempted to match those files to participants in the program tracking database using the project ID and home address. Of the 566 files, 504 conclusively matched to the database using the home addresses and participant IDs. An additional 31 files

matched on the basis of project ID, but had incorrect addresses⁷. Due to the overwhelming majority of files matching so closely, the team excluded those with data inconsistencies (e.g., incorrect addresses) from analysis.

Across the sample, energy modeling showed energy savings 24% lower than ex ante deemed kWh savings. The variance seen in ex ante and ex post energy savings for this program most likely resulted from the difference in program assumptions regarding home size and installed energy features, which varied significantly across the sample. As shown in Figure 8, of 22 participant incentive categories, only two indicated electric energy savings higher than the ex ante estimate.

Figure 8. kWh Savings by Incentive Category

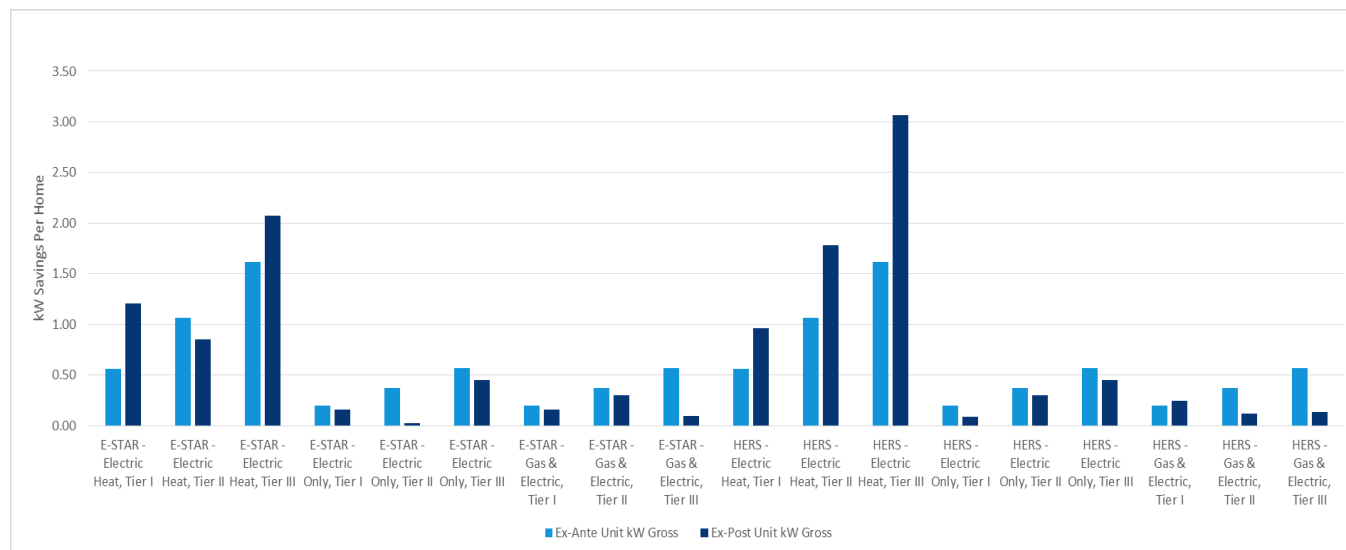


Note: Details on realization rates are shown below in Table 14.

Across the sample, the REM/Rate analysis showed demand savings 21% lower than ex ante deemed kW savings. As shown in Figure 9, five of six electric heat home categories showed savings higher than ex ante deemed savings. However, electrically heated homes represented less than 10% of the PY8 program homes.

⁷ Some homes had addresses that appeared to be only slightly off and we did not drop those projects from the analysis. If the HERS rater file indicated a lot number instead of an address those were also included in the analysis since lot numbers are common identifiers when homes are being constructed. Examples of where we excluded homes from analysis include (both city and address were different, builder did not match HERS raters' files, or obviously different addresses)

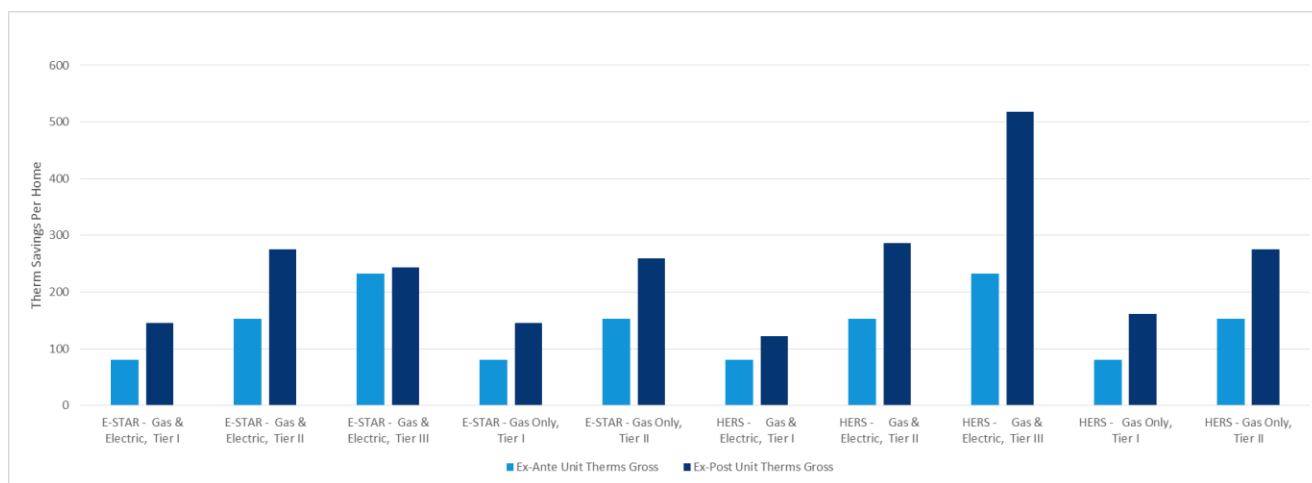
Figure 9. kW Savings by Incentive Category



Note: Details on realization rates are shown below in Table 14.

Across the sample, the REM/Rate analysis showed gas savings 81% higher than ex ante deemed gas savings, a result similar to that observed in past program years. Program homes commonly feature energy-efficient water heating and gas furnaces, both of which significantly drive gas savings. As shown in Figure 10, gas savings are higher than ex ante deemed savings across every incentive category.

Figure 10. Therm Savings by Incentive Category



Note: Details on realization rates are shown below in Table 14.

Realization Rate Details

In PY8, the program implementer provided calculations for ex ante deemed savings values, which had been developed based on assumed heating and cooling energy usage of a typical code-built home. Percent savings values applied to each measure assumed the maximum HERS rating for that category and the actual heating

fuel used. The implementer methodology also assumed that builders would build homes which equally save gas and electricity.

The HERS score is based on how much total energy a home saves in comparison to a baseline. Since both therms and kWh are units of energy, reducing the usage of either fuel (or both concurrently) results in a lower HERS score. The evaluation team's analysis finds that on average, and given the opportunity, builders choose to achieve their HERS score for gas-heated homes primarily with gas savings measures.

Also in the REM/Rate analysis, significant variances occurred regarding how homes are built and which energy efficiency measures builders choose to achieve the required HERS score. As in Figure 10, homes with electric heating showed significant variance in energy savings and realization rates. As ex ante deemed savings were developed to characterize the entire population, and individual homes greatly differed from each other, this realization rate variance was expected. However, average homes with electric heating received a 1.19 kWh gross realization rate, a figure significantly higher than in the program population.

The following factors affected realization rates:

- Variations in homes sizes and installed measures
- Builders' propensity to choose gas savings measures in gas-heated homes
- Builder compliance approaches
- Limited opportunities to exceed building codes for envelope measures
- High-efficiency heating and water heating systems offer cost-effective ways for builders to achieve the required HERS scores.
- The IECC 2012 building code was optimized to provide cost-effective requirements for building envelopes. Energy savings from exceeding those requirements diminish rapidly due to the inverse relationship between R-values and heat transfer. Doubling the R-values or insulation level of a structure results in diminishing energy saving returns, while incremental costs per unit of insulation stay the same or can even incrementally increase.

REM/Rate analysis of the 504 homes form the basis for the realization rates for each incentive category. The 504 homes analyzed represented greater than 90% of the participants in that category. For incentive categories where the team could not achieve 90% sampling of participants, the average realization rate for all homes was applied (denoted by "a") in Table 14, which details realization rates for each incentive category along with the overall realization rate.

Table 14. Realization Rates by Incentive Category

Rating Type	Fuel Type	Tier	Number of Participants Sampled	Percentage of Participants	Realization Rate MWh	Realization Rate MW	Realization Rate Therms
ENERGY STAR	Electric Heat	Tier I	26	93%	168%	215%	-
		Tier II	8	89%	78%*	80%*	-
		Tier III	2	100%	73%	129%	-
	AIC Electric Service	Tier I	0	0%	78%*	80%*	-
		Tier II	15	94%	19%	6%	-
		Tier III	1	50%	78%*	80%*	-
	AIC Gas Heat and Electric Service	Tier I	2	50%	78%*	80%*	180%*
		Tier II	17	85%	78%*	80%*	180%*
		Tier III	2	100%	37%	17%	105%
	AIC Gas Service Only	Tier I	0	0%	-	-	180%*
		Tier II	1	100%	-	-	169%
HERS	Electric Heat	Tier I	1	100%	93%	170%	-
		Tier II	4	100%	84%	168%	-
		Tier III	8	100%	115%	190%	-
	AIC Electric Service	Tier I	4	100%	62%	45%	-
		Tier II	18	86%	78%*	80%*	-
		Tier III	0	0%	78%*	80%*	-
	AIC Gas Heat and Electric Service	Tier I	104	93%	74%	124%	151%
		Tier II	239	91%	57%	32%	187%
		Tier III	9	100%	39%	23%	223%
	AIC Gas Service Only	Tier I	24	96%	-	-	199%
		Tier II	19	86%	-	-	180%
Totals			504	87%	76%	79%	181%

* Average realization rate applied

The program implementer had adjusted deemed ex ante gas and electric savings in PY8 for each home relative to previous years, based on realization rates from PY6. The original program deemed energy savings prior to PY6 were based on a percentage savings of a HERS 100⁸ house adjusted to the IECC 2009 baseline. These ex ante savings were then adjusted using an average realization rate from PY6 on both gas and electric energy

⁸ A HERS 100 house typically represents the IECC 2006 energy code. The original energy usage assumption by the program implementer assumed a HERS 100 house in Illinois consumed 800 therms and 12,000 kWh (gas-heated home) and 20,000kWh (electric heated home).

savings. Deemed savings were again adjusted by the program implementer in PY7 to account for the advancing baseline under IECC 2012. Table 15 below details both ex ante deemed savings used by the program implementer and the ex post gross savings found from the REM/Rate file analysis.

Table 15. PY8 Per Unit Ex ante and Ex Post Savings by Measure

Rating Type	Fuel Type	Tier	Ex Ante Unit kWh Gross	Ex Ante Unit kW Gross	Ex Ante Unit Therms Gross	Ex Post Unit kWh Gross	Ex Post Unit kW Gross	Ex Post Unit Therms Gross
ENERGY STAR	Electric Heat	Tier I	2,250	0.6	-	3,787	1.21	-
		Tier II	4,250	1.1	-	3,308	0.85	-
		Tier III	6,450	1.6	-	4,706	2.07	-
	AIC Electric Service	Tier I	675	0.2	-	525	0.16	-
		Tier II	1,275	0.4	-	242	0.02	-
		Tier III	1,935	0.6	-	1,506	0.45	-
	AIC Gas Heat and Electric Service	Tier I	675	0.2	81	525	0.16	146
		Tier II	1,275	0.4	153	993	0.30	275
		Tier III	1,935	0.6	232	726	0.10	244
	AIC Gas Service Only	Tier I	-	-	81	-	-	146
		Tier II	-	-	153	-	-	259
HERS	Electric Heat	Tier I	2,250	0.6	-	2,088	0.96	-
		Tier II	4,250	1.1	-	3,575	1.78	-
		Tier III	6,450	1.6	-	7,417	3.06	-
	AIC Electric Service	Tier I	675	0.2	-	419	0.09	-
		Tier II	1,275	0.4	-	993	0.30	-
		Tier III	1,935	0.6	-	1,506	0.45	-
	AIC Gas Heat and Electric Service	Tier I	675	0.2	81	496	0.24	122
		Tier II	1,275	0.4	153	730	0.12	286
		Tier III	1,935	0.6	232	763	0.13	518
	AIC Gas Service Only	Tier I	-	-	81	-	-	161
		Tier II	-	-	153	-	-	275

Table 16 shows total gross energy and demand savings impacts for new homes in PY8.

Table 16. AIC New Homes Gross Savings

Program	Ex Ante			Ex Post		
	MWh	MW	Therms	MWh	MW	Therms
New Homes	697	0.196	62,494	532	0.154	113,214
Realization Rates				76%	79%	181%

3.3.2 Net Impacts

The evaluation team applied SAG-approved NTGR values to the PY8 New Homes Program. The evaluation team conducted new NTG research in PY8 for future planning purposes, should the program be reinstated. The findings from this research are described in Appendix A. PY8 net energy and demand savings are shown below in Table 17.

Table 17. AIC New Homes Program Net Savings

	Ex Post Gross	NTGR	Ex Post Net
Energy Savings (MWh)			
Total MWh	532	1.011	538
Demand Savings (MW)			
Total MW	0.154	1.011	0.156
Therms Savings			
Total Therms	113,214	1.006	113,893

4. Conclusions and Recommendations

The PY8 ENERGY STAR New Homes Program delivered 577 single-family homes, achieving 125% of its goal and a 38% increase over single-family homes completed in PY7. The program also achieved an increase in the number of completed homes with a higher-efficiency HERS rating of 46–55 (62%) in comparison to PY7 (43%). Of 577 homes completed for program incentives, 107 (18%) received ENERGY STAR certifications, an increase over PY7 (when 15% of single-family homes achieved ENERGY STAR certifications).

At the end of PY8, AIC decided not to pursue the program for the future. As the evaluation team has seen in other parts of the country, new homes programs must find a balance between ever-increasing building codes and standards and cost-effectively incenting builders to build significantly above the baseline to capture additional energy savings (which can be expensive and difficult for builders to recover in a new home's sale price). Additionally, the intent of the IECC is to require the installation of cost-effective energy upgrades—leaving little room for AIC to incent builders to exceed the IECC.

Despite the ENERGY STAR New Homes Program's discontinuation in PY9, the evaluation team offers the following program conclusions and recommendations to assist AIC if it considers revising and restoring the program in future years.

- **Key Finding #1:** Program incentives alone are not driving builders to build well above the IECC. Rather, it appears to be the incentives in conjunction with the ever more stringent energy codes that are driving builders to reach the higher incentive tiers. Builders typically build new homes with direct venting for heating and water heating equipment, because those systems provide greater design flexibility. However, while the equipment is more expensive, the total cost⁹ can be lower than older atmospheric venting systems. Direct venting (and condensing) heating and hot water heating equipment are inherently more fuel efficient than the federal minimum efficiency standards. With the adoption of IECC 2015, most envelope improvement measures that go beyond the code do not prove cost-effective for builders. Nevertheless, incremental efficiency increases in heating and water heating equipment are less expensive than envelope improvements and therefore become attractive measures for meeting program HERS requirements.
- **Recommendation:** Increase builder awareness of AIC Heating and Cooling Program rebates available to homebuilders. Additionally, with the price of ductless heat pumps decreasing and availability becoming more available, explore incentives for these systems—specifically with homebuilders. Multi-zone ductless systems are becoming increasingly popular for low-energy homes, especially when energy codes require a very well insulated envelope. This means a home's heating demands may become low enough that high-efficiency ductless systems become a viable option.¹⁰ Additionally, builders favor high-efficiency water heating systems, which may serve as an addition to existing programs.

⁹ Atmospherically vented gas equipment requires a well-designed venting system since it relies on gravity and the lower density of the hot exhaust to properly vent the combustion gasses. While many factors can be considered when builders and architects choose the type of venting systems, the flexibility and simplicity of direct venting systems make these more preferable.

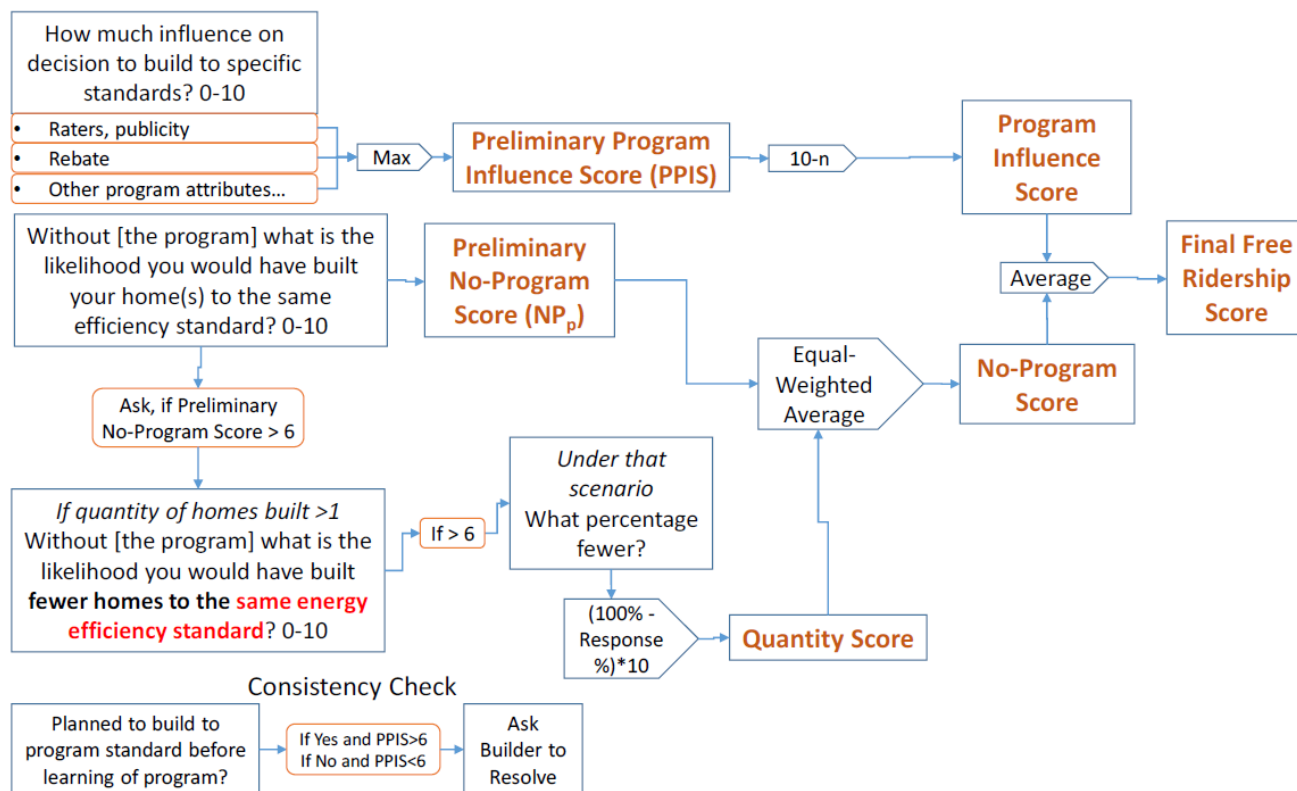
¹⁰ <http://www.greenbuildingadvisor.com/blogs/dept/musings/just-two-minisplits-heat-and-cool-whole-house>

- **Key Finding #2:** Cadmus' experience evaluating new homes programs, and the AIC builder interviews found that homebuyers do not make purchasing decisions based on energy efficiency since they do not perceive the added value of program-homes and assume all new homes are energy-efficient. Builders need AIC's support to educate the public and distinguish the value of their program homes.
- **Recommendation:** Should the program become cost effective in the future, increase program advertising and consider developing public education and awareness programs that encourage home buyers to look for and ask about energy efficiency features beyond ENERGY STAR appliances.

Appendix A. Net-to-Gross Analysis

The evaluation team followed the free-ridership and spillover calculation methods provided in the IL-TRM V5.0 to estimate the NTGR for future program years. The evaluation team used builder surveys to develop PY8 NTG values. The team used the IL-TRM – Attachment A framework to develop surveys and to analyze survey results. Figure 11 shows free-ridership logic outlined in the IL-TRM V5.0.

Figure 11. Residential New Construction Free-Ridership Logic



To quantify the program's free-ridership level,¹¹ the team calculated both a program influence score and a non-program score. The program influence score was based on the maximum influence level of any program element (e.g., incentive, technical support): "...based on the rationale that if any given program element had a great influence [...] the program itself had a great influence, even if other elements had less influence." The non-program score expresses the likelihood that builders would build "homes to the same standards and same quantities had the program not existed."¹²

¹¹ The IL-TRM V5.0 defines a free-rider as "a builder who would have constructed a home at the program's efficiency level in the program's absence." P. 78.

¹² IL-TRM V5.0, p. 79.

Additionally, to estimate the ENERGY STAR New Homes Program's spillover, the team asked builders if they built any homes in AIC's territory for which they did not apply for a program incentive.

Free-Ridership

The evaluation team estimated free-ridership as the average of the program's influence score and the non-program score.

Program Influence Score

The final program influence score equals the weighted average of one minus each builder's preliminary program influence score (PPIS): the maximum influence score (on a scale of 0 to 10) that each builder awarded any program element in terms of influencing the builder's decision to participate in the program.

The PPIS was scored primarily using the following question:

"I'm going to read a list of items about the Ameren Illinois program. Please rate each item on how important it was in the decision to build homes that are eligible for the Ameren Illinois program. Please use a scale from 0, meaning no importance, to 10, meaning the item was extremely important in your decision?"

We included the following potential influencers: incentive, technical assistance, the HERS rater, marketing support, and previous program participation.

Table 18 shows how the team calculated an average program influence score of 1.4. Builder responses were weighted by the number of homes they built in PY8, as reported in the program tacking data. The PPIS was subject to adjustment according to additional information from builder interviews. The PPIS adjustment was based on a consistency check performed during the interview.

Table 18. Program Influence Score Calculation

Builder		Program Influence Elements (0-10 scale)					Scoring		
Builder Number	Program Homes Built	Incentive	Technical Assistance	HERS Rater	Marketing Support	Previous Program Participation	Preliminary Program Influence Score (PPIS)	PPIS Adjustment	Program Influence Score ¹
1	6	7	5	7	DK	2	7	1 ²	4
2	2	10	DK	10	0	10	10		0
3	8	10	9	10	5	10	10		0
4	33	8	3	4	2	8	8		2
5	11	10	10	8	3	8	10		0
6	1	10	9	9	9	10	10		0
7	3	5	5	5	5	5	5		5
8	5	10	10	10	5	7	10		0
9	4	10	DK	10	N/A	7	10		0
Weighted Average	-	8.6	5.7	6.5	3.0	7.6	8.6	-	1.4

Key: DK= don't know

¹ Program influence score is calculated as (10 – (PPIS – PPIS_{Adjustment}))

² This builder's PPIS was adjusted downwards because the builder stated that he would build homes according to state energy codes regardless of the program, but that the program also had influence construction practices. They perceived that the major impacts on their building practices was due to the energy code and not the program.

Though Builder 1 indicated their highest program influences included the incentive and the HERS Rater (both scoring a 7), they indicated that they planned to build homes to this same standard before they learning of the program. When asked why the incentive and HERS Rater exerted a significant influence as the builder already planned to build homes to a higher standard, they responded:

"The change in state law required homes to be built with more energy-efficient practices, so I had already started following the standards that were set"—Builder 1

To the evaluation team, this indicated that building codes primarily influenced builders' homes rather than the program. While the program required the builder to construct a home even more efficient than the energy code, this participant already planned to build homes to this standard; they perceived the building code as their motivator. Consequently, the team reduced their PPIS score by 1 point (or 10%) based on our interpretation of Builder 1's responses, resulting in a program influence score of 4.

Non-Program Score

The team estimated the non-program score using a set of questions that asked respondents to gauge their likelihood of building homes to the same standards and in the same quantity had the program not existed.¹³ Each builder's non-program score resulted from the average of their preliminary non-program influence score (PNPIS) and the final quantity score. The PNPIS derives from the builders' estimation of the likelihood that they would have built homes to the same efficiency level, had the program not existed.

¹³ IL-TRM V5.0, p. 79.

The following question allowed PNPIS scoring:

“On a scale of 0 to 10, where 0 is not at all likely and 10 is very likely, how likely is it that you would have built your homes to the same efficiency standard if Ameren Illinois did not offer the ENERGY STAR New Homes Program?”

The quantity score (QS) was the builders’ estimation of the likelihood that they would have built fewer homes to the same efficiency standard had the program not existed. The team used the following question to score the QS:

“Using the same scale, how likely is it that you would have built fewer homes to the same efficiency standard if Ameren Illinois did not offer the ENERGY STAR New Homes Program?”

If QS is more than 6, the final no-program score is the equal weighted average of each builder’s PNPIS and QS. If PNPIS or QS was less than 7 or the number of program homes built was not greater than 1, the QS was not factored into the no-program score, in accordance with the IL-TRM V5.0 to estimate the NTGR for future program years. No surveyed participants who built more than one program home had QS more than 6 and thus no QS score factored into the no-program score for any builders represented in Table 19.

Table 19. No-Program Score Calculation

Builder Number	Program Homes Built	Preliminary Non-Program Influence Score (PNPIS) – Likelihood of Building Homes to Same Efficiency Level Without the Program	Quantity Score(QS) – Likelihood of Building Fewer Homes to Same Efficiency Level Without the Program ¹	No-Program Score
1	6	10	NA (0)	10
2	2	7	NA (0)	7
3	8	9	NA (0)	9
4	33	6	NA (PNPIS < 7)	6
5	11	10	NA (2)	10
6	1	9	NA (QTY=1)	9
7	3	10	NA (0)	10
8	5	6	NA (PNPIS < 7)	6
9	4	0	NA (PNPIS < 7)	0
Weighted Average		7.2	NA	7.2

¹ QS was not applicable (NA) for all respondents when calculating the non-program score as no one had QS more than 6 while also having a PNPIS more than 6 and program homes built greater than one. Parentheses with single numeric values indicate the QS for respondents whose PNPIS was more than 6 and built more than one program home. No surveyed participants who built more than one program home had QS more than 6 and no QS score factored into the no-program score for any builders.

Free-Ridership Score

As shown in Table 20, participants’ free-ridership ratio was the average of their program influence score and the no-program score, divided by 10. The overall ENERGY STAR New Homes Program free-ridership ratio of 43% is a program home’s weighted average of individual participants’ final free-ridership ratios.

Table 20. Final Free-Ridership Score and Ratio

Builder Number	Program Homes	Program Influence Score	Final No-Program Score	Final Free-Ridership Score	Final Free-Ridership Ratios
1	6	4	10	7.0	70%
2	2	0	7	3.5	35%
3	8	0	9	4.5	45%
4	33	2	6	4.0	40%
5	11	0	10	5.0	50%
6	1	0	9	4.5	45%
7	3	5	10	7.5	75%
8	5	0	6	3.0	30%
9	4	0	0	0.0	0%
Weighted Average		1.4	7.2	4.3	43%

Spillover Score

According to the IL-TRM V5.0, “participant spillover occurs when, due to program participation, a builder increases the energy efficiency built outside the program (but inside a utility’s service territory).”¹⁴

To estimate the ENERGY STAR New Homes Program’s spillover, the evaluation team asked builders if they built homes in AIC’s territory but did not apply for a program incentive. Only one of 13 responding builders stated that they built homes in AIC’s territory for and not apply for an incentive. This respondent reported building three single-family homes in AIC’s territory during 2015 or 2016 for which they did not apply for a program incentive, though they increased the efficiency of certain measures relative to their previous building practices. The team used the following questions to determine if the energy-efficient upgrades the participant implemented in non-program homes were influenced by their program participation:

“How important was your experience in the Ameren Illinois program in your decision to incorporate this building practice you’re your other homes, using a scale of 0 to 10, where 0 is not at all important and 10 is extremely important?”

“If you had not participated in the Ameren Illinois program, how likely is it that you would still have incorporated this building practice using a 0 to 10, scale where 0 means you definitely WOULD NOT have implemented this measure and 10 means you definitely WOULD have implemented this measure?”

Responses to the first question established spillover measure attribution score 1, and responses to the second question established spillover measure attribution score 2. As set forth in the IL-TRM V5.0, spillover is program-attributable for measures with self-report data meeting the following conditions:

$$\text{Spillover Attribution Rating} = (\text{Measure Attribution Score 1} + (10 - \text{Measure Attribution Score 2})/2) > 7$$

¹⁴ IL-TRM V5.0, p. 81.

Though Builder 6 responded with potential spillover activity, they did not have a spillover attribution rating for any measure greater than 7, and no spillover activity was credited to the program. The highest spillover attribution rating from Builder 6 was 7 and therefore this spillover would have counted had the protocol used a threshold of 5.

Recommended Program NTGRs

Table 21 shows weighting results for each builder's free-ridership and spillover scores to ex post gross savings of PY8 homes, completed by each builder and resulting in the fuel-specific NTG ratios.

Table 21. NTGR by Savings type

Savings Type	Free-Ridership	Spillover	NTGR
Energy (MWh)	43%	0%	57%
Demand (MW)	39%	0%	61%
Gas (Therms)	46%	0%	54%

Note: Free-ridership for each savings type is weight averaged to each respective savings type and therefore the mix of measures results in different values for demand and energy.

Appendix B. Data Collection Instruments

Ameren Illinois ENERGY STAR New Homes Program Evaluation PY 8 Participant Builders Survey Guide

Researchable Subject	Researchable Questions /Discussion	Question
Freeridership and NTG	What is the estimated NTGR of the program?	3-7, 17-35
Program Design and Implementation	<p>Builder motivation</p> <p>What changes occurred in PY 8 and what is the impact of these changes? (Probe changes in incentives and the impact of those changes on electric vs gas savings)</p> <p>How aware are customers, of the program and energy efficiency? How has that changed since PY7? What are their priorities when purchasing a home?</p> <p>What program marketing efforts occurred in PY 8? (builder awareness and program training)</p> <p>What changes have occurred in communication between HERS raters/AIC and builders?</p>	<p>9-10</p> <p>15-16</p> <p>36-39</p> <p>8, 40</p> <p>45-50</p>
Trade ally experience and satisfaction	How satisfied are builders with the program? (Probe is AIC providing adequate feedback on application receipt and status.)	40-53
Market Effects	How has the availability of ENERGY STAR certified HVAC contractors changed since PY7 and what are the impacts of these changes?	11-14
Opportunities for Program Improvement	What changes could the program make to improve customer or trade ally experience and generate greater participation or savings?	42, 44, 47, 50, 52, 53

Survey Guide

Business name _____

Respondent _____

Date _____

Interviewer _____

Introduction

Hello, my name is [NAME] from Cadmus, I am calling on behalf of Ameren IL. May I speak with [INSERT NAME] [OR IF NO NAME SAY, “someone at your company who is familiar with your participation in the Ameren IL Energy Star New Home Program”?] We are conducting a study on behalf of Ameren and we are talking to builders about their experience providing services for Ameren’s ENERGY STAR New Homes Program.

Screening

1. Ameren Illinois identified your company as one of the builders who participates in Ameren Illinois’ ENERGY STAR New Homes Program. Just to verify, does your company participate?
 1. Yes
 2. No (Thank and Terminate)
 3. Don’t know [ASK, is there someone else that I can talk to about this?]
 4. Refused (Thank and Terminate)

[THANK AND TERMINATE TEXT: Those are all of the questions. Thanks for your help. Have a nice day.]

2. The interview will take approximately 20 minutes of your time. Do you have time right now for us to complete the interview?
 1. [IF YES] Thank you. Your individual answers will be kept confidential and only summary information will be shared with Ameren Illinois.
 2. [IF NO] What would be the best time for me to call back and talk with you?

[IF NEEDED:] I am not selling anything. We are interested in your opinions to help improve our programs. Your response will remain confidential.”]IF NECESSARY Jonathon Jackson with Ameren Illinois, 309.677.5093, can be contacted to confirm the validity of this study.

Building Volume

3. When did you first join the program?
4. Does your company build both single-family homes and multifamily homes?
 1. Single only
 2. Multifamily only
 3. Both
 4. Other [RECORD ANSWER _____]
5. During 2015, about how many homes did you build?
6. For the year 2015, about what percent of these homes are built in Ameren Illinois territory, which covers central and southern Illinois? (IF NEEDED: Total homes should include Ameren Illinois ENERGY STAR, non-ENERGY STAR qualified homes, and all non-qualified homes).

Record answer [Single Family: _____] [Multifamily: _____]

7. And of the **single-family** homes you built in 2015 in the same area, what percentage were Ameren Illinois qualified New Homes (ENERGY STAR and HERS only)?

ENERGY STAR 3.0 _____

HERS SCORE ONLY _____

Participation

8. How did you first learn about the Ameren Illinois ENERGY STAR New Homes Program? **[DO NOT**

READ LIST. RECORD ALL]

1. HERs rater
2. Homebuilder association
3. Working with AIC in a different capacity/another program
4. Internet research
5. Other **[SPECIFY]** _____
6. Don't know
7. Refused

9. What were the reasons why you decided to participate? **[DO NOT READ LIST. RECORD ALL]**

1. Differentiate homes from other builders
2. Was already building energy-efficient homes
3. To receive an incentive
4. To receive extra support and training on new building techniques
5. Other **[SPECIFY]** _____
6. Don't know
7. Refused

[ASK IF MORE THAN ONE RESPONSE MENTIONED IN Q9 OR IF ANSWER IS NOT DON'T KNOW OR REFUSED]

10. Of the reasons you stated, which was the most important in your decision to participate? **[READ**

RESPONSES FROM Q9 IF NEEDED]

[RECORD ANSWER] _____

[IF Q7 INCLUDES ENERGY STAR 3.0 HOMES ASK Q11, OTHERWISE SKIP TO Q15]

Market Effects

11. ENERGY STAR 3.0 requires an HVAC checklist, which is completed by an ENERGY STAR-certified HVAC contractor. In past years, we heard there were few ENERGY STAR-certified HVAC contractors to do this work. Did you experience this?

1. Yes

2. No
3. Don't know
4. Refused

12. In what ways if any, has this changed in the last year? **[DO NOT READ LIST]**

1. No change
2. It's gotten easier to find someone
3. It's gotten harder to find someone
4. Other **[RECORD ANSWER]** _____
5. Don't know
6. Refused

[IF Q12=2, 3, OR 4]

13. To what do you credit this change? **[IF NEEDED: Why do you think this?]**

[IF Q12=2, 3, OR 4]

14. In what ways, if any, has this affected your building of ENERGY STAR homes? **(Probe, are they building fewer/more ES homes?)**

[ASK 15 and 16 of everyone]

15. In the last year the program has made the HERS requirements a little more challenging. What, if any effect, has this change had on the way you build your homes?

1. (No change)
2. **[RECORD ANSWER]** _____
3. Don't know
4. Refused

16. How has the incentive increase impacted the way you build homes?

1. No change
2. **[RECORD ANSWER]** _____
3. Don't know
4. Refused

Freeridership

Now I would like to ask you about what your building practices would have been if the program did not exist.

17. On a scale of 0 to 10, where 0 is not at all likely and 10 is very likely, how likely is it that you would have built your homes to the same efficiency standard if Ameren Illinois did not offer the ENERGY STAR New Homes Program?
18. **[IF Q17>6]** Using the same scale, how likely is it that you would have built fewer homes to the same efficiency standard if Ameren Illinois did not offer the ENERGY STAR New Homes Program? **[IF NEEDED: Using the same 0 to 10 scale, where 0 is not at all likely and 10 is very likely.]**
19. **[IF Q18>6]** If you would have built fewer homes, what percentage of those homes would you have built to the program efficiency standard? **[RECORD ANSWER]** _____

Influence is assessed by asking about how important – from 0 (no influence) to 10 (greatly influential) – various program elements had on the decision to build to the program standard. The items selected for rating are specific components of the program being evaluated.

20. I'm going to read a list of items about the Ameren Illinois program. Please rate each item on how important it was in the decision to build homes that are eligible for the Ameren Illinois program. Please use a scale from 0, meaning no importance, to 10, meaning the item was extremely important in your decision.

Item	Rating	Don't know	Not applicable
a. The Ameren Illinois incentive			
b. The technical assistance I receive from the program			
c. The HERS rater			
d. The marketing support Ameren Illinois provides to me to market the program homes			
e. I previously participated in the program			

21. What else, if anything, was highly important in your decision to build homes that are eligible for the Ameren Illinois program we've been talking about?
- [RECORD ANSWER]** _____
 - (Nothing)
 - (Don't know)
 - (Refused)

[IF Q21 IS ACTUALLY A PROGRAM ELEMENT (different wording for a, b, c, d or e ABOVE) ASK Q22]

22. On a scale of 0-10, how important was this to your decision? **[Incorporate Answer into Q20 table to use in questions Q24 and Q25]**

23. Prior to hearing about the program, had you already planned to build your homes to the same level of energy efficiency that you did through the program?
1. Yes
 2. No
 3. Don't know
24. **[IF Q23=1 and Q20a, b, c, d or e >6]** Given that you had plans to meet the standard prior to learning about the program, why do you think the **[insert program element(s) with highest score FROM Q20]** were important in your decision to meet the standard **[OPEN END]**
25. **[IF Q23=2 and Q20a, b, c, d or e <6]** Given that you had no plans to meet the standard prior to learning about the program, why do you think the **[incentive, technical assistance or marketing support or insert answer from Q21]** was/were not more important in your decision to meet the standard? **[OPEN END]**
26. **In your own words, please tell me the influence the program had on your building practices.**

Building Practices/Spillover

Spillover This section will ask customers about any rebate-eligible measures they installed without applying for an Ameren Illinois incentive. The responses are used to estimate free spillover, and are weighted by savings and added to the NTG ratio to estimate the net effects of the program.

27. During 2015 or 2016, did you build any other single family homes in Ameren territory, for which you did NOT apply for a program incentive?
1. Yes
 2. No
 3. Don't know
28. **[IF Q27=YES]** How many?
29. **If [Q27=YES]** Thinking about those homes which were not enrolled in the Ameren Illinois program and for which you did not receive an incentive from the program, how many of them were built to program standards, even though you did not receive an incentive?
30. **If [Q27=YES]** Now I'd like to ask you about any other single family homes you built in 2015 or 2016, in Ameren's territory, which were **NOT** built to the program's energy efficiency standards. Did you increase the energy efficiency of those homes in any way relative to previous building practices? **[IF NEEDED: For example, did you increase insulation, or add high-efficiency heating equipment?]**
1. Yes
 2. No [SKIP TO Q 36]
 3. Don't know [SKIP TO Q 36]

31. **[IF Q30=YES]** In what ways? **[DO NOT READ COMPONENT OR IECC 2012 COLUMN]**

Component	Follow Up Questions	Answer	IECC 2012
Added Programmable Thermostat	N/A	NA	Heating 72F Cooling 75F Programmable Thermostat
Increased Ceiling Insulation	What is the Resistance Value (R) or Heat Loss Value (U)?		U-0.026
Increased Wall Insulation	What is the R or U value?		U-0.057
Increased Floor Insulation	What is the R or U value?		U-0.033
Increased Slab Thickness	What R value or thickness?		R-10, 2ft
Higher Efficiency Windows	What is the U value?		U-0.32
Tightened Infiltration	What Air Changes per Hour?		5ACH50
Tightened Allowed Duct Leakage	What Level in Cubic Feet per Minute in Conditioned Floor Area?		4CFM/100CFA
Increased Duct Insulation	What R Value Attic? What R Value, Other?		R-8 Attic Supply, R-6 Otherwise
Added Heat Pump	What Efficiency Level – Heating Seasonal Performance Factor (HSPF) or Seasonal Energy Efficiency Ratio (SEER)?		7.7 HSPF
High Efficiency Furnace	What Efficiency Level in Annual Fuel Utilization Efficiency (AFUE)?		80 AFUE
Added High Efficiency Boiler	What Efficiency Level in AFUE?		82 AFUE
Added High Efficiency AC	What Efficiency Level in SEER?		13 SEER
Lighting (Percentage of CFL and LED)	What percentage is high efficiency CFL or LED?		75% CFL or LED
Efficient Appliances	What appliance and what efficiency level?		RESNET Default

Efficient Water Heat	What efficiency level in Energy Factor (EF)? What fuel type?		0.59 EF Gas, 0.91 EF Electric
Other	What efficiency level?		

32. **[Ask for each item mentioned in Q31]** In how many of these single family homes, did you install [insert efficiency measure from Q31].

Component	Percentage of Homes
Programmable Thermostat	
Increased Ceiling Insulation	
Increased Wall Insulation	
Increased Floor Insulation	
Increased Slab Thickness	
Higher Efficiency Windows	
Tightened Infiltration	
Tightened Allowed Duct Leakage	
Increased Duct Insulation	
Added Heat Pump	
High Efficiency Furnace	
Added High Efficiency Boiler	
Added High Efficiency AC	
Lighting (CFL, LED)	
Efficient Appliances	
Efficient Gas Water Heat	
Efficient Electric Water Heat	

33. **[Ask for each item mentioned in Q31]**, I'm going to ask you again about each building practice we just discussed. This time, please tell me how likely it is that you would still have incorporated each building practice if you had NOT participated in the Ameren Illinois program. Please rate the likelihood using a scale where 0 means you definitely WOULD NOT have implemented this building practice and 10 means you definitely WOULD have implemented this building practice.

Component	0-10 Rating
Programmable Thermostat	
Increased Ceiling Insulation	
Increased Wall Insulation	
Increased Floor Insulation	
Increased Slab Thickness	
Higher Efficiency Windows	
Tightened Infiltration	
Tightened Allowed Duct Leakage	
Increased Duct Insulation	

Added Heat Pump	
High Efficiency Furnace	
Added High Efficiency Boiler	
Added High Efficiency AC	
Lighting (CFL, LED)	
Efficient Appliances	
Efficient Gas Water Heat	
Efficient Electric Water Heat	

34. **[Ask for each item mentioned in Q31]** And on a 0 to 10 scale, with 0 meaning “not at all important” and 10 meaning “very important,” how important was your experience in the program in deciding to incorporate **[insert building practice]** in your other homes?

Component	0-10 Rating
Programmable Thermostat	
Increased Ceiling Insulation	
Increased Wall Insulation	
Increased Floor Insulation	
Increased Slab Thickness	
Higher Efficiency Windows	
Tightened Infiltration	
Tightened Allowed Duct Leakage	
Increased Duct Insulation	
Added Heat Pump	
High Efficiency Furnace	
Added High Efficiency Boiler	
Added High Efficiency AC	
Lighting (CFL, LED)	
Efficient Appliances	
Efficient Gas Water Heat	
Efficient Electric Water Heat	

35. What else, if anything, was important to your decision to build additional homes or incorporate energy-efficient building practices to the program’s standard without receiving an incentive?

Marketing and Outreach

Now I’d like to ask you about how familiar your customers are with the New Homes Program.

36. About what percentage of homebuyers would you say are familiar with the ENERGY STAR New Homes Program before they visit with you?

[RECORD ANSWER] _____

37. How frequently do buyers ask about energy efficiency when they visit your model homes?
1. Very frequently
 2. Occasionally
 3. Not very often
 4. Not at all
 5. (Don't know)
 6. (Refused)
38. How has the level of interest or inquiry into energy efficiency changed over the last year? Has it ...
- [READ LIST]
1. Increased
 2. Decreased
 3. No change
 4. Other [RECORD ANSWER] _____
39. In order of importance from most important to less important, what are the top three priorities of your homebuyers when purchasing a new home from you? {DO NOT READ. RATE TOP 3 PRIORITIES}
1. (Comfort/Temperature Regulation)
 2. (Energy Efficiency/Lower Energy Bills/Save Energy)
 3. (Floor Plan/Layout)
 4. (Location/Neighborhood)
 5. (Price/Cost of home)
 6. (Quality of Construction)
 7. (School District)
 8. (Other)
 9. (Don't know)
 10. (Refused)

Program Satisfaction

40. What kind of training did you receive about the program, and who conducted it (Rater, CSG/CLEAResult, and Ameren)? [ASK WHO CONDUCTED IT FOR EACH TYPE OF TRAINING RECEIVED]
- [RECORD ANSWER] _____
41. How satisfied are you with the training you received from [INSERT FIRST COMPANY FROM Q40]? Would you say you are: [READ LIST]
1. Very satisfied
 2. Somewhat satisfied
 3. Not too satisfied
 4. Not at all satisfied
 5. Don't know

6. Refused

42. Is there any way in which the training you received could be improved?

[RECORD ANSWER] _____

[IF MORE THAN ONE COMPANY IS MENTIONED IN Q40, ASK Q43 AND Q44.]

43. How satisfied are you with the training you received from [INSERT SECOND COMPANY FROM Q40]?

Would you say you are: [READ LIST]

1. Very satisfied
2. Somewhat satisfied
3. Not too satisfied
4. Not at all satisfied
5. Don't know
6. Refused

44. Is there any way in which the training you received could be improved?

[RECORD ANSWER] _____

45. When thinking about the communication you receive from program staff about the program or your projects, would you say it has...

1. Improved in the past year
2. Gotten worse in the past year
3. Remained unchanged in the past year
4. NA
5. Don't know

46. [SKIP IF Q45 = 4 OR 5] How satisfied are you with the communication you receive from program staff about the program or your projects? Would you say you are: [READ LIST]

1. Very satisfied
2. Somewhat satisfied
3. Not too satisfied
4. Not at all satisfied
5. Don't know
6. Refused

47. How could communication with program staff be improved? [DO NOT READ LIST]

1. No improvement needed
2. Other [RECORD ANSWER] _____

48. When thinking about the communication you receive from raters about the program or your project, would you say it has...

1. Improved in the past year

2. Gotten worse in the past year
3. Remained unchanged in the past year
4. NA
5. Don't know

49. **[SKIP IF Q48 = 4 OR 5]** How satisfied are you with the communication you receive from raters about the program or your projects? Would you say you are: **[READ LIST]**

1. Very satisfied
2. Somewhat satisfied
3. Not too satisfied
4. Not at all satisfied
5. Don't know
6. Refused

50. How could communication with raters be improved? **[DO NOT READ LIST]**

1. No improvement needed
2. Other **[RECORD ANSWER]** _____

51. How satisfied are you with Ameren Illinois' ENERGY STAR New Homes Program overall? **[READ LIST]**

1. Very satisfied
2. Somewhat satisfied
3. Not too satisfied
4. Not at all satisfied
5. Don't know
6. Refused

52. What about the Ameren Illinois' ENERGY STAR New Homes Program works well?

[RECORD ANSWER] _____

53. What about the Ameren Illinois ENERGY STAR New Homes Program could be improved?

[RECORD ANSWER] _____

Thank you for your time. Do you have anything you'd like to add regarding the Ameren Illinois ENERGY STAR Homes Program?

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