2012 Residential New Construction Program Impact and Process Evaluation Report

Prepared for FirstEnergy Ohio Companies:

The Cleveland Electric Illuminating Company

Ohio Edison Company

The Toledo Edison Company

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1. Executive Summary

For 2012, the Ohio operating companies The Cleveland Electric Illuminating Company (CEI), Ohio Edison (OE), and Toledo Edison (TE) (collectively "Companies") offered the Residential New Construction program. The Companies sought to increase the energy efficiency of 1,300 new homes in 2012 by providing incentives to home builders that construct their homes to be 15% to 30% better than the minimum building code standards (IECC 2006). The ENERGY STAR® rating or equivalent Home Energy Rating System Program (HERS) score was used to determine eligibility. Participants received a rebate based on the calculated energy savings related to the home's construction as reported on the "fuel summary report" or similar. Rebates for appliances, lighting and other plug loads were aggregated within the Residential New Construction program. The Companies contracted with Performance Systems Development (PSD) to provide supporting program components including builder recruiting, verification of building plans and documentation to qualify for the incentives, provision of on-site notification of receipt of award under the program, as well as for marketing and outreach services to the builder community.

A total of 1344 homes in the service territories of the Companies received rebates through the Residential New Construction Program in 2012. The number of participating builders within each utility is shown in Table 1-1.

Table 1-1: Program Builder Participation by Utility

Utility	*Number of Participants*
CEI	12
OE	13
TE	5
All Companies	30

Ex post gross electric savings were estimated through detailed analysis of program tracking data and participant survey data. ADM Associates, Inc. (ADM) verified program savings through REM/Rate by comparing the user-defined reference home as specified in the draft *State of Ohio Energy Efficiency Technical Reference Manual* ("TRM")[1] to the as-built home model generated by the HERS rating company from plan sets and field data.

Ex post verified electric savings was 3,061,354 kWh annually (a realization rate of 91 percent). *Ex post* verified peak demand reduction was 431 kW. For detailed tables listing energy savings and demand reductions by measure type, please refer to Appendix A. *Ex post* gross energy savings (kWh) and peak demand reduction (kW) for the program in the three service territories are reported in Table 1-2.

[1] Vermont Energy Investment Corporation (VEIC), *State of Ohio Energy Efficiency Technical Reference Manual,* Prepared for Public Utilities Commission of Ohio, Draft of August 6, 2010.

Table 1-2. Overall Evaluation Results

Utility	*Ex Ante Expected Gross Savings*		*Ex Post Verified Gross Savings*	
	Gross kWh	*Gross kW*	*Gross kWh*	*Gross kW*
CEI	728,156	115	657,246	111
OE	1,989,724	268	1,789,601	261
TE	659,277	62	614,506	59
All Companies	3,377,157	445	3,061,354	431

Key findings from the process evaluation of the 2012 Residential New Construction program include:

- Builders are relying heavily on raters to learn about and comply with the program.
- The cost of going to ENERGY STAR® Version 3.0 is too high for some builders.
- The program appears to be popular with multi-family builders.
- "Green communities" are becoming popular but they do not recognize ENERGY STAR® any more.
- Perception of ENERGY STAR® Version 3.0 from homebuyers is that it is expensive and they do not recognize the value.
- Builder satisfaction is high with the program.
- Program training attendance is low among builders.
- The participating builders we spoke with plan to have all of their buildings qualify for the program in 2013.
- Raters report an excellent working relationship with PSD.
- Raters report the COMPASS software provided by PSD as being easy to use although improvements can be made.
- Notification of a failed Quality Assurance (QA) sometimes came too late.
- Rater satisfaction with the program is high.
- Raters are having a hard time getting builders, contractors, and architects to understand ENERGY STAR® Version 3.0 and how to become compliant.
- Raters expressed concerns about the dependency the builders have on them.
- Local and state building code changes could be a future challenge to the program.

Since its inception two years ago, the Companies' Residential New Construction Program has seen a fair amount of success. Future success will be somewhat limited by the lack of energy efficiency awareness and the value of ENERGY STAR® homes amongst builders and homebuyers. Identifying ways to educate these stakeholders will be key to the continuing success of the program and increasing builder participation from those not currently building to ENERGY STAR® Version 3.0 standards.

Continued support by the raters will also be key to the continued success of the program. Builders are influenced by rater's suggestions and buy-in into the program. Maintaining a close working relationship between PSD and the raters will provide the support the raters need to continue to promote the program.

2. Introduction and Purpose of Study

Under contract with the Companies, ADM is performing measurement and verification (M&V) activities to confirm the energy savings and demand reduction being realized through the energy efficiency programs that the Companies are implementing in Ohio in 2012. The purpose of this report is to present the results of the impact evaluation effort undertaken by ADM to verify the energy savings and peak demand reductions that resulted from the implementation of the Residential New Construction Program during 2012. Additionally, this report presents the results of the process evaluation of the program focusing on participant and program staff perspectives regarding the program's first year of implementation. The impact evaluation component in 2012 will estimate gross energy savings (kWh) and peak demand reduction (kW) as framed by the following research questions:

- How many builders participated in the program and how many homes were constructed per plan type per builder?
- What is the correct baseline energy code for each permitted home?
- Do the sample homes modeled in the energy modeling software reflect the as-built homes in the field? Do they reflect the architectural details shown on the city approved plan set?
- What were the savings generated per model home for each sample home?

The goal of the process evaluation component will be to determine how effective the program is in terms of customer satisfaction, builder and home buyer awareness, and stakeholder interaction. The process evaluation will be framed, therefore, by the following research questions:

- What were the most common measures installed to meet program eligibility guidelines?
- How effective were the marketing efforts for the program? Which marketing methods were most effective?
- How well did Company staff and the implementation team work together?
- What changes can be made to the program's design or delivery to improve its effectiveness in future program years?

Additional research questions that will be answered during the course of the evaluation year are:

- Which installed measure have the greatest homebuyer perceived value and the least homebuyer perceived value?
- What do builders feel are the greatest challenges or obstacles to program participation?
- Which individual measure types are generating the greatest kW savings?

3. Description of Program

The Residential New Construction Program encourages the building of energy efficient homes for increased comfort, enhanced energy performance and savings, and increased marketability of the home. Homes must meet third-party verification standards for energy efficiency to qualify for incentives. A full remodel of an existing home (gutting the home down to the studs) also qualifies under this program.

The Companies offer rebates for builders of new, energy efficient homes. Each newly built home is eligible for a rebate of $400, and $0.10/kWh saved annually over the reference home, as calculated by the modeling software, REM/Rate. The ENERGY STAR® rating or equivalent Home Energy Rating System Program (HERS) score is used to determine eligibility. Participants can receive a rebate based on the calculated energy savings related to the home's construction as reported on the "fuel summary report" or similar. The maximum rebate amount per home is $1,200 and all construction and installation requirements of the program must be met. Qualifying homes will be built to ENERGY STAR® Version 3.0 requirements, be at least 15 percent more efficient than the 2006 IECC, and be located within the service areas of one of the Companies.

The Companies contracted with Performance Systems Development to implement the program on their behalf to eligible customers. PSD promotes the program to builders and raters and is a resource for program participation. PSD processes the rebates to builders once eligibility of the home has been determined and met.

The EM&V effort for the Residential New Construction program has two goals:

- Determine the gross energy savings and demand reductions due to the features of the homes which caused it to perform better than the IECC 2006 baseline efficiency home
- Determine builder and HERS rater satisfaction with the program design.

In addition to paying cash incentives, this program also represents a market transformation program, aimed at reducing multiple barriers to this higher level of construction standards. Builders can attend training sessions which highlight the improved energy performance of the homes, promote The Program, and communicate the associated benefits of buying a program-qualified home. The following are examples of the types of training opportunities that are provided:

- Sales staff training sessions on how to use the program and energy efficiency as a strong selling point
- Technical training sessions on building to program specifications and energy-efficient construction practices

Program participation is contingent upon an internal eligibility review and verification process conducted by the implementation contractor. This process provides a first layer of assurance to the Companies and the participating builders that the homes will meet program specifications and be at least 15% more efficient than required by code (IECC 2006). The first level of quality control is implemented through HERS (Home Energy Rating System) Raters who implement the RESNET (Residential Energy Services Network) testing processes and procedures or the equivalent. All participating builders must meet the quality control requirements of the approved HERS Providers including the use of certified HERS Raters to perform inspections of the home during construction and just prior to occupancy. The second level of quality control involves plan reviews for each plan type and for all participants.

The plan review is conducted by the implementation contractor. All participating homebuilders are assigned an Account Manager to help them maximize their benefits from participation and leverage available incentives and opportunities for market differentiation.

4. Methodology

This chapter provides a description of the methodology applied by ADM in the evaluation of the 2012 Residential New Construction program. The chapter is divided into two sections: impact evaluation methodology and process evaluation methodology.

4.1 Impact Evaluation Methodology

Our approach for M&V of the Residential New Construction Program included:

- Determining quantity of homes in population and plan types per builder
- Performing engineering calculations and desk reviews of energy modeling data
- On-site data collection

The impact evaluation component in 2012 estimated gross energy savings (kWh) and peak demand reduction (kW) as framed by the following research questions:

- How many builders participated in the program and how many homes were constructed per plan type per builder?
- What is the correct baseline energy code for each permitted home?
- Do the sample homes modeled in the energy modeling software reflect the as-built homes in the field? Do they reflect the architectural details shown on the city approved plan set?
- What were the savings generated per model home for each sample home?

4.1.1 Data Collection and Verification of Program Population

The first aspect of conducting measurements of program activity was to verify the numbers of home participating in the program and the plan types of each home. Our verification work was based on using program tracking data. To begin the verification effort, we reviewed the tracking system data on reported homes to determine that all homes were eligible for the program. Additionally, the tracking system was reviewed to insure that the proper data fields required to support this evaluation as well as future evaluations were included. The tracking system was reviewed for completeness, accuracy, and efficiency.

4.1.2 Engineering Review

Due to the limited availability of data for ADM's evaluation effort, ADM had to use various sources for the engineering review of the 2012 Residential New Construction program. There were five types of data collected for

evaluation of the 2012 Residential New Construction program; homes had either the Companies' QA/QC field visit data, ride along data, rater interviews, builder interviews, homeowner surveys, plan sets, or ADM's field visit verification information. Plan sets generally included information about the insulation levels in the ceiling and wall. QA/QC data included more detailed information, like duct testing values and infiltration, as well as insulation values. As for builder interviews, these data sets had the most detailed information, including percentages of CFLs and window u-values and SHGC values, as well as the information previously mentioned. Through the review process, ADM assessed the reasonability of the model's input and outputs.

ADM reran each of the provided models to reproduce the *ex ante* savings estimates. This step served as an initial check to evaluate potential reasons for discrepancy between the *ex ante* and e*x post* savings (i.e. data entry error or variant models).

The architectural plans were reviewed to verify that the construction of the simulation accurately represented that of the incentivized home. Each of the builders was also interviewed with regards to construction practices and material selection. Then, ADM leveraged the data collected from visits to partially constructed homes to verify that the construction techniques and materials being modeled were appropriate. ADM then verified each home's orientation[2] using satellite mapping techniques and/or on-site verification. Finally, ADM verified the builder provided lighting and appliances by interviewing home builders and home owners over the phone.

4.1.3 On-site Data Collection Procedures

ADM staff conducted on-site visits to verify home builders' construction practices and plan types. During the on-site visits, ADM implemented standard HERS rater performance verification procedures to test the home's duct leakage and infiltration. Builder provided appliances were verified against model numbers listed in site documentation and percentage of high efficiency lighting was documented. While on-site, ADM documented the following items:

- Attic insulation thickness, application and R-values
- Presence of radiant barriers
- Window glazing and frame materials
- Architectural plan options
- Window ratings
- Appliance model numbers
- Installation percentage of CFLs
- Air Conditioning and Furnace SEER rating

[2] With respect to the four Cardinal points (North, South, East, and West)

4.1.4 Gross Savings Estimates

The performance of each prototype home was verified by obtaining the original electronic data file from the builder's simulation software and updating it to match the as-built conditions observed during the on-site data collection and monitoring visit. To account for natural variation in building orientation and to verify major equipment efficiencies of the homes, a simple random sample from the tracking system data was taken. An on-site verification of this sample determined if the home was constructed or not, and if it is occupied or not, the home's actual cardinal orientation. While on-site ADM also verified heating fuel type and outside unit air conditioner/heat pump efficiency. The overall realization rate was determined by summing up the appropriate quantity of each plan type, for the frequency of orientations found in the drive-by site visit. Follow-up telephone interviews were required in some cases to verify equipment efficiency if not accessible during the drive-by visit. Updates to the prototype REM/Rate models may have included:

- HVAC systems (capacity and efficiencies)
- Window square footage
- Duct leakage
- House infiltration
- Actual widow orientations
- Efficient Appliances, lighting, appliance, and other plug loads

The energy savings and demand reductions for any energy efficiency components not incorporated into the comprehensive building simulation model, and any measures installed through the other residential rebate programs, were determined based upon the methods outlined in those programs. For example, additional CFL's beyond the number assumed in the REM/Rate calculation were given the deemed savings associated with CFL's as per the TRM.

ADM used the REM/Rate "Fuel Summary" report to evaluate both the as-built and baseline simulated home's annual energy use. An example of this report is given in Figure 4-1.

Figure 4-1
Example REM/Rate Fuel Summary Report

FUEL SUMMARY

Date:	November 24, 2008	Rating No.:	2437
Building Name:	1202	Rating Org.:	Energy Inspectors
Owner's Name:		Phone No.:	(702)365-8080
Property:	Newcastle	Rater's Name:	
Address:	Las Vegas, NV	Rater's No.:	
Builder's Name:	American West Homes		
Weather Site:	Las Vegas, NV	Rating Type:	Based on Plans
File Name:	Plan 1202 ES Base.blg	Rating Date:	9/2/08

		1202
Annual Energy Cost ($/yr)		
Natural gas	$	397
Electric	$	1110
Annual End-Use Cost ($/yr)		
Heating	$	251
Cooling	$	584
Water Heating	$	116
Lights & Appliances	$	556
Photovoltaics	$	-0
Service Charges	$	156
Total	$	1663
Annual End-Use Consumption		
Heating (Therms)		326
Heating (kWh)		428
Cooling (kWh)		6614
Water Heating (Therms)		177
Lights & Appliances (Therms)		104
Lights & Appliances (kWh)		5514
Annual Energy Demands (kW)		
Heating		0.2
Cooling		3.4

REM/Rate calculates simulated energy use on an annual basis (not hourly) and reports maximum peak demand reduction instead of coincident peak demand. Therefore, ADM used the methodology defined in the TRM to calculate coincident peak demand reduction.

4.2 Sampling Plan for the Impact Evaluation

Program participants accumulated over time as the program was implemented. Thus, a complete list of all projects was not available until the end of the program year. For this reason, a systematic sampling approach was used to select sample sites as program implementation proceeds such that sample selection is spread over the entire implementation period. The sample design was used for selecting program projects which allowed estimates of savings to be determined with ±90% precision at a 7.2% confidence level for the program.

ADM conducted a stratified random sampling approach, whereby we first select a sample of representative home builders and then select a random sample of prototype homes within each builder. When possible, ADM selected several prototype homes for each builder. This selection represented the range of home sizes and floor plans offered by that builder. Concurrent with the on-site evaluation of the prototype homes, ADM conducted verification and data collection for a sample of participant homes of the same floor plan as the prototype homes. Depending on the stage of construction, the following items were documented in the participant's homes:

- Presence of radiant barrier
- Insulation depth, application, and R-Values
- Window ratings
- Appliance model numbers
- Installation percentage of CFLs
- Air Conditioning and Furnace SEER rating

Table 4-1
Sampling Frame, Sample Size, and Relative Precision by Activity

Sampling Frame	Sample Size	Relative Precision
Program population through December	18	±7.2

4.3 Process Evaluation Methodology

The process evaluation component was designed to answer the following four research questions:

- What were the most common measures installed to meet program eligibility guidelines.
- How effective were the marketing efforts for the program? Which marketing methods were most effective?
- How well did Company staff and the implementation team work together?
- What changes can be made to the program's design or delivery to improve its effectiveness in future program years?

ADM initiated the impact and process evaluations in the fall of 2012 with the development of surveys and sampling frames and to field the telephone surveys beginning in January. Table 4-2 summarizes the focus of the five impact evaluation research questions along with their associated methods of data collection and analysis.

Table 4-2
Summary of Process Evaluation Questions and Methods

Evaluation Question	Data Collection Method	Data Analysis Method
How effective was the program marketing?	Participant Survey Stakeholder Interviews	Qualitative Analysis
How well did Company staff and the implementation staff work together?	Stakeholder Interviews	Qualitative Analysis
Which were the most common measures installed to meet program guidelines?	Participant Survey	Qualitative Analysis
What changes can be made to the program's design/delivery to improve effectiveness?	Participant Survey Stakeholder Interviews	Qualitative Analysis

4.3.1 Effectiveness of Program Marketing

ADM relied on the participant survey to determine the marketing channels through which participants become aware of the program. Survey respondents were asked a series of questions aimed at determining the reasons for participating in the program and their company's energy conservation objectives prior to participation. These questions helped determine how effective the marketing materials are at inducing program participation and the general attitudes of the homebuilders about efficiently building practices prior to program implementation.

4.3.2 Stakeholder and Participant Interviews

To address research questions one, two, and four, ADM and TetraTech conducted open-ended interviews by telephone and in-person with key program staff, including the:

- Company Program Manager
- Implementation Contractor Staff
- Program Participants

Interview topics varied by respondent, as appropriate to the respondent's role and history with the Residential New Construction program. General topics included program design, whether there have been any changes in implementation, communication between the utility and implementation staff, marketing efforts, quality control, customer communication, and implementation barriers.

5. Detailed Evaluation Findings

This chapter provides the detailed findings from both the impact and process components of the evaluation.

5.1 Impact Evaluation Findings

This section presents the findings of the impact evaluation of the 2012 Residential New Construction program.

5.1.1 Verification of Program Population

As a first step toward estimating program level kWh and kW impacts, ADM reviewed program tracking data provided by PSD for accuracy. No duplicate entries were discovered. To verify that the homes in the population were eligible for rebate ADM performed review of vintage of all home. All homes were found to qualify within the program guidelines. During the home vintage review and desk review of rater documentation and RemRate files ADM discovered multiple incorrect address. It was determined through discussions with PSD that this was primarily caused by raters entering data based on RemRate file names. Oftentimes these file names contained lot numbers or tentative address instead of physical street address from a final county assessor recorded subdivision map.

5.1.2 Gross Annual kWh Savings

Gross annual kWh savings were calculated as described in chapter four of this report. The details and results of these calculations are reported in this section.

Table 5-1 shows the quantities of homes, ex ante and ex post kWh, and realization rate for each stratum. For the final sampling plan kWh was stratified by rater. The four raters with the largest program contribution in kWh were separated into individual strata. These strata made up 95 percent of the program kWh. The raters associated with the remaining 5 percent of program savings made up stratum 5.

Table 5-2 shows the variance of energy savings and realization rates by Company. The main cause of variation in the kWh savings was the orientation of the homes. ADM adjusted orientations in the ex post RemRate models based on site verification and satellite mapping technologies. Other less common causes of variation were SEER values on AC, systems efficiencies of water heaters, and higher tested duct leakages than modeled.

Table 5-1. Summary of Energy Impacts for the Residential New Construction program by Strata

Strata	*Ex Ante Total (kWh)*	*Ex Ante Sampled (kWh)*	*Weight*	*Ex Post Sampled (kWh)*	*Ex Post Total (kWh)*
Stratum 1	1,875,499	27,417	68.4	23,990	1,641,070
Stratum 2	1,160,662	14,077	82.5	13,117	1,081,509
Stratum 3	87,514	31,789	2.8	31,370	86,361
Stratum 4	85,536	10,086	8.5	10,077	85,460
Stratum 5	167,946	16,087	10.4	15,992	166,954
Program Totals	**3,377,157**	**99,456**		**94,546**	**3,061,354**

Table 5-2. Variance of Energy Savings and Realization Rate

EDC	*Ex Ante Annual Energy Savings (kWh)*	*Ex Post Annual Energy Savings (kWh)*	*Variance (kWh)*	*Realization Rate*
CEI	728,156.00	657,246	70,910	90%
OE	1,989,724.00	1,789,601	200,123	90%
TE	659,277.00	614,506	44,771	93%
Total	**3,377,157**	**3,061,354**	**315,803**	**91%**

5.1.3 Gross Peak Demand (kW) Savings

Gross peak demand savings were calculated per the TRM. The difference in electricity demand for the user defined reference home (UDRH) and the rated home was calculated and multiplied by a coincidence factor of .5

(based on the Energy Center of Wisconsin, May 2008 metering study). ADM generated fuel savings reports for the rated home's RemRate model in the version of RemRate the home was originally modeled. This eliminated any possibility of savings discrepancies due to RemRate version changes. In some versions RemRate, illogical values were assigned to duct leakage in the rated home models. Since all homes in the sample had significantly better than average leakage during the duct leakage testing the kW usage in the reference home for duct leakage was conservatively adjusted to account this discrepancy. Gross peak demand for the 2012 program year was 431 kW.

5.2 Process Evaluation Findings

This section provides the findings of the process evaluation component of this report. Tetra Tech, working in conjunction with ADM and Associates, conducted in-depth interviews with staff from the Companies, PSD, and raters and builders (both active and inactive in program participation). Interviews were conducted in March, 2013. Tetra Tech spoke with the Company program lead, three PSD staff, seven builders, and seven raters. Of the seven builders, two had signed up for the program but had not actively participated. In total, Tetra Tech conducted eighteen in-depth interviews for this qualitative assessment. The objective of these interviews was to gather feedback to determine how the program is operating and to collect suggestions for program improvements.

The in-depth interviews with program staff, implementation staff, raters, and builders addressed the following researchable issues:

- The effectiveness of the program's marketing
- How well the program staff and the implementation staff worked together
- What changes can be made to the program's design/delivery to improve effectiveness
- What do builders and raters feel are the greatest challenges or obstacles to program participation
- Overall satisfaction with the program

5.2.1 Companies Program Staff Administration, Oversight and Communication

The Companies contract with PSD to administer the Residential New Construction Program. AEG houses the program data. Among the PSD program team are the program coordinator, a QA manager, and an administrative assistant. The program coordinator is responsible for overseeing the program's goals, and marketing and outreach efforts. They also assist participants in the sign-up process; help them with technical assistance in submitting the actual home, and review program submissions. The QA manager is responsible for overseeing a team of technical specialists that conduct the QA services. The administrative assistant provides new raters and builders with program documentation and marketing materials once they sign up. The raters are also provided a login ID and password for the COMPASS software. The administrative assistant also handles the completion and submission of W9 forms which are required for all builders receiving a rebate.

Builders communicate directly with their rater, and the raters communicate directly with PSD. Builders mostly coordinate with their rater to ensure program requirements are met. Raters work with PSD to submit the paperwork in order for builders to receive the program incentives. Raters are also required to submit their ratings to their provider. Quarterly, PSD sends the rating submissions of each rater to their respective provider as required by the program.

Raters reported a positive working relationship with PSD. All the raters we spoke to stated they are receiving the support they need in a timely manner.

5.2.2 Effectiveness of program marketing

Marketing efforts are performed by PSD staff and participating raters. Once a builder or rater has signed up for the program, PSD sends a packet containing documentation, explaining the benefits of the program, and examples of available marketing brochures to pass on to sales staff, technical partners, and homebuyers. The kit contains a letter directed to either a builder or a rater explaining the contents of the packet, which includes:

- A technical overview for the builders and raters
- Company pen and carpenter pencil
- Brochure outlining benefits for builders
- Brochure outlining benefits for homebuyers, and
- A sample Homebuyer Certificate.

Builders and raters who participate in the program are listed on the Companies' program website for potential homebuyers and builders to seek approved program partners. Builders and raters have access to training seminars, webinars, conferences, and networking events, along with opportunities to be featured in program outreach efforts.

Five out of the seven builders we spoke to heard about the program from their rater. Only one recalled receiving any marketing material containing information regarding the program. Builders are not discussing the program amongst each other, as becoming an ENERGY STAR®-builder is a competitive marketing tool for them.

5.2.3 Program design and delivery

Currently, eligible homes receive a rebate of $400, and $0.10/kWh saved annually over the reference home, as calculated by the modeling software, REM/Rate. The maximum amount per home is $1,200 and all construction and installation requirements of the program must be met, including being 15 percent more efficient than the 2006 IECC standards.

Builders will typically bring a rater in during the design phase of the building. It is here where the rater would suggest modifications to become ENERGY STAR® Version 3.0 compliant. Some raters will present more than one proposal for builders to choose from, outlining different upgrades and the potential savings they would achieve. This is effective for an incentive-based program because builders can essentially choose their investment and corresponding incentive amount.

Once a building has been completed, a certified HERS rater will conduct a blower-door test and other visual checks to determine whether or not it meets the requirements of the program. If so, the rater submits the results in PSD's COMPASS software and uploads the REM/Rate results.

After submission by raters, the PSD QA manager reviews 100 percent of the entries using pre-programmed mathematical checks in the system to catch any simple data entry errors, such as a wall not being documented. Once approved by the QA manager, arrangements are made for an on-site QA check. Ten percent of all submissions will require an on-site QA. Eight percent will receive a full comprehensive review with a blower-door test and other mechanisms, and the other two percent consists of only a visual review, ensuring the correct number of bulbs is installed, the right equipment models are reported, etc.

If the calculated savings between the raters' reports and the QA's results are within a 15 percent difference, the rating is accepted and a check is issued to the builder. If the savings difference is greater than 15 percent or PSD's QA review results in a failed rating, PSD will go back to the rater and either have them correct the rating or give them the opportunity to work with the builder to become compliant.

5.2.4 Current and future challenges

Builders are having a hard time understanding the ENERGY STAR® Version 3.0 guidelines. Builders rely heavily on raters for program details. They have developed long-term trusted relationships and will often follow the suggestions of their rater. One builder stated the standards are so complicated that they let the rater tell them what they need to do. One builder indicated it was also difficult to communicate the new criteria to their contractors and get them to comply.

The cost to jump to ENERGY STAR® Version 3.0, from any previous code, is too high for some builders. The rebates are not high enough to justify the cost, according to one builder. Another builder was only concerned about meeting the minimum standards to receive the Federal tax credits, while another builder said they would not build to ENERGY STAR® Version 3.0 standards without the consortium of all programs and credits.

Some builders are finding ways to sell the ENERGY STAR® label and are able to recover the costs associated with Version 3.0. One developer is recovering the increased costs of their buildings through increased rent. Using signage and other ENERGY STAR® information, they are able to justify an increase in rent to renters and then able to recoup the costs. According to one builder, "Renters are happy because they are seeing their bills reduced." The four builders who produced more than 100 homes per year, along with the custom builders we spoke to, stated they are already building to ENERGY STAR® Version 3.0 standards as part of their business model. The program did not influence their decision to do so. One custom builder, who is not currently seeking the program rebates, uses geothermal systems in all their homes. One stated, "ENERGY STAR® [label] doesn't help me sell anything, but they [his buildings] would all qualify. I would build this way anyways."

"Green communities" are becoming popular in Ohio but they are not recognizing ENERGY STAR®. ENERGY STAR® is considered the standard rather than the exception in these communities so obtaining the certification does not carry much weight for builders so they do not want to spend the money to get the homes in these communities ENERGY STAR® certified.

The perception of homebuyers, according to the builders and raters we spoke to, is that ENERGY STAR® is expensive and the homebuyers do not recognize the value, with exception to already "green"-minded people. Energy education is needed to change this perception and increase demand for energy efficient homes. Using cost-benefit modeling tools to show the monthly savings in dollars would help to show the advantage of having an ENERGY STAR® certified home. Homebuyers do not understand the meaning of HERS scores and R-values, according to one builder.

Additionally, the lack of recognition of energy efficiency features in home appraisals may not encourage homebuyers to purchase more energy efficient equipment. According to one builder, homebuyers who are looking to build their dream home have chosen features such as granite countertops over energy efficient equipment because they do not see the value, either due to their lack of energy efficiency knowledge or because the value of it is not reflected in the appraisal. This will continue to be an issue until the appraisal process has adopted energy efficient measures and certifications as part of a building's value.

5.2.5 Program Satisfaction

Program satisfaction is high among participating builders and raters. Raters appreciate the marketing opportunity it provides for selling their services and builders are more satisfied because they are able to build better quality homes, market the energy efficiency of the home, and receive an incentive.

Four out of the seven raters we spoke to were asked to rate their overall satisfaction with the program on a scale of 1 to 5 where 1 means “very dissatisfied” and 5 means “extremely satisfied.” Three of the four raters gave a rating of four or five. One rater said, “We love the program and we’ll stay with it as long as you’re there with it.”

Builder satisfaction is also high with the program. Builders that were asked to rate their level of satisfaction gave a rating of four or five on the same 1 to 5 scale. The program is particularly popular with multi-family builders because, according to one large multi-family builder, they only have to worry about one building envelope and receive an incentive for each unit within that.

Two builders gave a rating of two. One builder gave that rating due to the difficulty in the submission process. This multi-family builder requested the building information only be entered once for multiple unit submissions. The other builder gave the two rating because they build homes that meet higher efficiency standards than ENERGY STAR® Version 3.0 and felt the label did not mean anything in comparison to the home’s other certifications.

6. Conclusions and Recommendations

This chapter reports the conclusions and recommendations resulting from the impact and process evaluation of the 2012 Residential New Construction program.

6.1 Conclusions

A total of 1344 homes in the service territories of the three Companies received rebates through the Residential New Construction program in 2012. The number of participating builders in each service territory was as follows:

- CEI 12
- OEC 13
- TEC 5

Estimated electric impacts were 3,061,354 kWh saved annually, which represents a realization rate of 91 percent. Average on-peak demand reduction was estimated to be 431 kW. For detailed tables listing energy savings and demand reductions by measure type, please refer to Appendix A. Estimates of annual gross energy savings (kWh) and on-peak demand reductions (kW) for the program in the three Companies are reported in Table 6-1.

Table 6-1: Overall Evaluation Results for Gross kWh and kW Savings

Utility	***Ex Ante Expected Gross Savings***		***Ex Post Verified Gross Savings***	
	Gross kWh	***Gross kW***	***Gross kWh***	***Gross kW***
CEI	728,156	115	657,246	111
OE	1,989,724	268	1,789,601	261
TE	659,277	62	614,506	59
All Companies	3,377,157	445	3,061,354	431

Since its inception two years ago, the Companies' Residential New Construction Program has seen a fair amount of success. Future success will be somewhat limited by the lack of energy efficiency awareness and the value of ENERGY STAR® homes amongst builders and homebuyers. Identifying ways to educate these stakeholders will be key to the continuing success of the program and increasing builder participation from those not currently building to ENERGY STAR® Version 3.0 standards.

Continued support by the raters will also be key to the continued success of the program. Builders are influenced by rater's suggestions and buy-in into the program. Maintaining a close working relationship between PSD and the raters will provide the support the raters need to continue to promote the program.

6.2 Process Findings

- **Builders are relying heavily on raters to learn about and comply with the program.** Five out of the seven builders we talked to learned about the program through their rater. The other two do not remember where they first heard about the program. Builders also rely heavily upon the raters for understanding how to comply with the program. Some report that understanding the new standards are too complicated so they depend on the rater to tell them in the design phase what they need to do to qualify for the rebates. One rater said, *"Builders don't have the time, energy, staff, or expertise to understand what they need to do to meet the 3.0 standard so they don't do it."*

- **The cost of going to ENERGY STAR® Version 3.0 is too high for some builders.** The rebates from the New Homes program alone are not high enough to cover the building materials and labor costs, and builders are often unable to recoup the costs in their sale price. This was reported to be a higher concern of smaller builders, those who are building less than 100 homes a year. One builder reported their average cost to go to the ENERGY STAR® Version 3.0 standard is $5,000 on a standard mid-sized home. It was suggested that rebates be increased to around $2,000 to gain participation from currently non-participating builders. None of the builders we spoke to indicated they pass the incentive on to the homebuyer.

- **The program appears to be popular with multi-family builders.** The incentive was perceived as more beneficial to the multi-family builders because they only have to worry about one envelope and a small number of outside walls per unit ratio.

- **"Green communities" are becoming popular but they do not recognize ENERGY STAR® any more.** These communities are looking at higher certifications such as LEED or PassivHaus. ENERGY STAR® is perceived as an assumed standard and does not have the selling impact it used to.

- **Perception of ENERGY STAR® Version 3.0 from homebuyers is that it is expensive and they do not recognize the value.** Builders are reporting that they are having problems selling the upgrade to ENERGY STAR® Version 3.0 is that they understand the value of it versus the initial investment to get there.

- **Builder satisfaction is high with the program.** Builders were asked to rate their overall satisfaction with the program on a scale of 1 to 5 where 1 means "Very dissatisfied" and 5 means "Extremely satisfied." Four of the six builders who answered that question gave a rating of four or five.

- **Program training attendance is low among builders.** Only one builder stated they have attended any of the program offered trainings, whereas most of the raters have attended at least one. This was also confirmed after speaking to program staff at PSD.

- **Raters report an excellent working relationship with PSD.** Robert Shearer at PSD is viewed as responsive, knowledgeable, experienced, and helpful. One rater said, *"Rob is doing a great job working with me and getting together with me often to make sure I clearly understand how this process works so I have nothing to say but good things about them and their work."* Another rater said, *"Definitely Robert Shearer has been a key element in our success in the program".*

- **Raters report the COMPASS software provided by PSD as being easy to use although improvements can be made.** All of the raters we spoke with said the submission process is easy and only two needed

additional assistance from PSD. Raters who primarily work with multi-family buildings expressed dissatisfaction with having to enter in the address information for the building for every unit submitted rather than the system auto-filling the address for subsequent units to help make submission quicker.

- **Notification of a failed Quality Assurance (QA) sometimes came too late.** Notification of a failed QA was reported as being one to two months, and in some cases even longer. During those one to two months, raters and builders stated the homeowners have since moved in and it is too late to address the non-compliant issues, therefore unable to participate in the program when they intended to do so.

- **Rater satisfaction with the program is high.** Four out of the seven raters[3] we spoke to were asked to rate their overall satisfaction with the program on a scale of 1 to 5 where 1 means "very dissatisfied" and 5 means "extremely satisfied." Three of the four raters gave a rating of four or five. The other one said, *"I am really in the middle. I'm satisfied with it so it's good."*

- **Raters are having a hard time getting builders, contractors, and architects to understand ENERGY STAR® Version 3.0 and how to become compliant.** Raters are working to educate the builders and architects on the program requirements but they are finding either they do not have enough time to give or the builders, contractors, and architects are reluctant to change because they cannot see the value. One rater said, *"I've got to say through that for the record that education is very much lacking in the builder world and that includes developers and general contractors, they don't have a clue about this stuff. I tell them time and time again and they still don't have a clue or understand it and I can't even get them to go to the website and read about it. …architects are having a real hard time with the process. They want to know so much more about the program than I have time to give them, like why do you do a blower door test, tough questions like that. So they haven't done any homework. …They need training severely; it is incredible how much the new code has confused them."*

- **Raters expressed concerns about the dependency the builders have on them.** Builders are essentially treating raters as one of their staff whose role is to understand code standards, methods for achieving them, and what other programs are out there, rather than someone who is expected to know those things but hired to come in and rate the buildings. While the raters definitely use this knowledge as a selling attribute, the burden on them can sometimes be significant to keep up with builders' questions and needs, the ratings, coordination of quality assurance (QA) sessions, and submission of paperwork to their own provider. This has sometimes resulted in falling behind on submissions to the program, which has caused some dissatisfaction to the builder when they do not receive their rebates in a timely manner. Raters also stated that the extra time spent on a job in forcing them to increase their costs.

- **Local and state building code changes could be a future challenge to the program.** If the IECC codes go up and the requirements of ENERGY STAR® stay the same, the calculated savings would be reduced. One staff member said, *"If that trend continues then that gap is going to get smaller and smaller because codes keep making houses more and more efficient. Eventually there will be a point of diminishing return. You can only make a house so efficient."*

[3] Three builders were not asked to rate their satisfaction of the program due to time constraints.

6.3 Recommendations

The Companies' Residential New Construction Program is relatively new, less than two years old. During the first year, the program was primarily working to promote the program and get builders and raters signed up. The builders and raters we spoke with that are actively using the program report high levels of satisfaction and state they will continue to use the program as long as it is available. To assist in the continued success of the program, we provide the following recommendations.

- **Allow participation in multiple programs.** Allow Energy Efficient New Homes program participating builders the ability to take advantage of other Company energy efficiency programs, such as the Energy Efficient Products program. This would be an acceptable practice because the Residential New Construction Program does not rebate for specific equipment. Cross promotion of programs is a common practice among other utilities' program portfolios and may both peak non-participating builders' interest as well as gain additional energy savings for the Companies' portfolio of energy efficiency programs.

- **Create synergies between Ohio energy efficiency programs where possible.** If a builder has already paid a HERS rater to rate the same home but for another program, such as Columbia Gas, and the home meets the requirements of the Companies' Residential New Construction Program, allow the builder to use the same rating for the home to qualify for the Companies' rebates without having to pay for additional testing and rating. This would encourage builders to take advantage of both programs for the cost of one rating. The Companies could require that the builder and rater agree to this approach prior to participating in both programs to ensure the rating addresses the requirements of both programs.

- **Consider increasing and expanding marketing outreach efforts of the program.** We heard from builders that much of the program awareness was coming directly from the raters. The Companies or their implementation contractor should engage directly in the program marketing effort, and should continue to direct outreach to non-participating builders and to those who have signed up for the program but have not been actively participating. Additionally, the program implementers should increase the outreach to the raters who have become the key instrument in program implementation. Provide raters with additional support, including on-site field support and marketing materials, and alleviate the dependency from builders on raters to understand and meet the program requirements. Further, expand the marketing efforts beyond builders and raters to include realtors, developers, neighborhood associations, community development corporations, and residents to make them aware of the program and to educate them on the benefits of having an ENERGY STAR® home. This could be done through local media outlets, such as TV, radio, mailings, bill inserts, billboards, and other signage. Conduct direct outreach to larger players such as large real estate companies and builder associations.

- **Increase ENERGY STAR® Version 3.0 education efforts and market them.** Similar to the marketing efforts the Companies or their implementation contractor should directly engage in education for the Residential New Construction Program, including identifying different avenues for providing education to builders, architects, and contractors. The Companies or their implementation contractor should provide educational presentations at builder association meetings to inform them of the program, the new requirements, and provide cost-effective ways they can meet those requirements. Work with the raters to identify those in need of a more personalized training session.

- **Modify the COMPASS reporting tool for submission of multi-family buildings.** All of the raters we spoke to found the software easy to use, however, it was mentioned that entering the information for multi-

family homes is onerous because address information has to be filled out repeatedly for each submitted unit. Modify the software so building address information only needs to be entered once, so that the software would prefill that information for subsequent units.

- **Reduce the time in which it takes builders to be notified of a failed QA.** There were concerns that in cases where the home did not pass the QA inspection, it was too late for the builder to address them and qualify for the program. Notification of a failed QA was reported as being one to two months, and in some cases even longer. In this time builders stated the homeowners have since moved in and it is too late to address the non-compliant issues.
- **Consider a tiered incentive program.** Follow a tier program based on HERS rating with higher incentives for meeting ENERGY STAR® Version 3.0 requirements. The leap to ENERGY STAR® Version 3.0 is too high for some builders for the level of the Companies' incentive. Raters indicated builders who are not participating in the Companies' program are being influenced by Columbia Gas's new homes program to build to a higher efficiency standard because the incentives are more in line with the cost for them to build to those standards, and they are rewarded with higher incentives for each increased efficiency level they achieve.
- **Continue to conduct QA reviews for at least 10 percent of participating homes.** It is estimated by program staff that approximately 50 percent of homes that went through the QA process resulted in increased energy savings that were previously unidentified. Other utility programs tend to be around 5 percent.
- **Inform builders of new appraisal addendums that help appraisers give additional value to energy efficient homes.** The country's largest appraisal professional group, the Appraisal Institute, recently released an updated "green addendum" that realty agents and sellers can use to call attention to the energy-saving features of homes, especially in areas where the local MLS provides no separate green fields. Appraisers can attach the addendum to their standard appraisal reports to justify additional value assigned to the house because of the cost-saving improvements. Builders aware of this addendum can request this, or a similar process, for the appraisals of their structures to help increase value. While the builders ultimately do not have the final say in how a building is appraised, the request to use such a process could help transform the appraisal process by bringing the need to light.
- **Add assessor's parcel number to database and confirm all rater's addresses are correct before entering into tracking database.** There were significant address errors in the 2012 program database. Requiring and entry for assessor's parcel number and the address that corresponds with the APN will help to eliminate the address discrepancies.
- **Require builders to provide full plan sets for all plan types submitted to the program.** One of the greatest challenges of the 2012 program evaluation was to gather enough supporting documentation to validate the energy savings in the sample homes. The sample was originally stratified by EDC but after numerous attempts to gather plan sets and compliance reports from the raters and homebuilders ADM found it necessary to reduce the sample size to only incorporate sites for which enough data had been gathered to validate all above code measures. Gathering this data when the plans are submitted and ensuring it is on file prior to the rebate being paid to the builder will eliminate any potential sampling bias in the future.

7. Appendix A: Pro-Rata Ex Post Savings and Lifetime Savings

Pro Rata kWh savings were calculated based on the audit date for each customer and then summed up to reach the program level savings number. For example if a participant had an implementation date of January 17, 2012 their Pro Rata savings would be calculated as follows:

$$Pro\ Rata\ kWh = \frac{365 - 17}{365} * Annualized\ kWh\ Savings$$

Pro Rata kW savings were calculated in a similar manner. If the implementation date occurred prior to June 1, 2012, the pro rata and annualized kW savings were the same. If an implementation date occurred after August 31, 2012 the pro rata kW savings was 0. However, for participants whose implementation date occurred between June 1, 2012 and August 31, 2012 the kW savings was pro-rated. For example if a participant had an implementation date of June 17, 2012 their Pro Rata savings would be calculated as follows:

$$Pro\ Rata\ kW = \frac{92 - 17}{92} * Annualized\ kW\ Savings$$

The program lifetime is 25 years as defined by the TRM. Lifetime savings are calculated as:

$$Lifetime\ Savings = Measure\ Life \times Annualized\ Savings$$

Table A-1 tabulates the results by operating company for Pro Rata and Lifetime savings.

Table 7-1 Pro Rata Ex Post Savings and Lifetime Savings

	Number of Participants	*Pro Rata Ex Post kWh*	*Pro Rata Ex Post kW*	*Lifetime kWh*	*Lifetime kW*
CEI	12	657,246	56	16,431,156	1,397
OE	13	1,789,601	132	44,740,034	3,303
TE	5	614,506	30	15,362,652	750
Combined	**30**	**3,061,354**	**218**	**76,533,842**	**5,449**

8. Appendix B: Interview Guides

FirstEnergy OH Residential New Construction Program Builder Guide

Interview Guide Format

This interview guide is for builders who work with FirstEnergy's New Homes program.

First, the guide summarizes the key researchable issues that the interviews will explore. This is followed by the specific questions that will be asked of the builders.

Because senior staff will be conducting interviews, interviews will be semi-structured. Therefore, the following interview protocol is only a guide to ensure certain topics are covered, but evaluators will follow the flow of the interview and modify questions as needed to fit the interviewee's circumstance.

Overarching Key Researchable ISSUES

- What were the most common measures installed to meet program eligibility guidelines.
- How effective were the marketing efforts for the program? Which marketing methods were most effective?
- How well did FirstEnergy staff and the implementation team work together?
- What changes can be made to the program's design or delivery to improve its effectiveness in future program years?
- Which installed measures have the greatest homebuyer perceived value and the least homebuyer perceived value.
- What do builders feel are the greatest challenges or obstacles to program participation?

Introduction

My name is _____, with Tetra Tech. We are working with ADM Associates to evaluate the New Homes program sponsored by FirstEnergy.

The study will provide recommendations on how FirstEnergy can improve the program for builders and their customers. I would like to ask you some questions about your experience with the program. Your feedback on the program is extremely valuable as FirstEnergy wants to improve your experience and satisfaction with the program. This interview should take approximately 30 minutes of your time. May we take some time now to do the interview? (If no, when would be a convenient time?)

(IF NECESSARY) I want to assure you that all of your responses and information about your company will be kept confidential and will not be reported individually by your name or businesses' name.

Introduction and Business Scope

I'd like to start with some general information about you and your company.

1. Approximately how many <u>total</u> homes did you complete in 2012? [NOTE: Be sure to ask each of the bullet questions below.]

- How many of these were FirstEnergy program homes?
- And how many of these qualified for a rebate from FirstEnergy's New Homes Program?

2. Approximately how many <u>total</u> homes do you expect to complete in 2013?

   - Of your 2013 homes, how many will likely qualify for rebates from FirstEnergy's New Homes program?
   - If 0, ask: Why aren't you planning to build any program-qualifying homes this year?
   - What would have to change within the program for you to build a larger proportion of program homes this year? (Probe to ask about changes under the program's control.)

   [NOTE: If 0 homes, adjust subsequent questions to obtain feedback on past participationexperience.]

3. And approximately what percent of your company's revenues are from working with FirstEnergy's New Homes Program? This would include revenues from other employees at your company, if any.

4 Who is your target market for FirstEnergy's New Homes program? (Probe on income level, family size, first time vs. move-up buyers, geographic location, etc.)

5. Do you mostly build spec homes, or do buyers have input into the final designs?

6. Do you build homes in the other utility service territories as well?

   - IF YES: In what territories?
   - IF YES: Do you currently participate in their new homes/new construction program, or plan to? IF NO: Why not?

Program Requirements

Now I'd like to ask you about the program requirements.

7. Are any program requirements unclear to you?

   - If YES: Which ones?

8. Do you have any recommended changes to the program requirements? (If needed: These changes could pertain to the equipment requirements, training needs, HERS ratings, or rebate amounts, for instance.)

9. What are your biggest challenges to building program qualifying homes?

10. How satisfied are you with the program's technical support?

    - PROBE: What kind of support does FirstEnergy provide?
    - How important is this support for your participation in the program?

- Do you go to anyone else for support?

11. Are you aware of other “green” or energy efficiency related programs for new homes in Ohio?

- If YES: Do you also build homes to their requirements?
- If YES: How do you think homebuyers perceive homes built to FirstEnergy’s requirements compared to other green homebuilding programs?

Marketing

Now I’d like to ask you about how you market your new homes.

12. Do you sell your homes through your own sales reps or through real estate agents?

If Sales Reps Used:

- Have any of your reps received specific training on your FirstEnergy program homes?
  - If NO: do you plan to give them training or detailed information about the FirstEnergy program homes you build?
- Are they effectively selling the advantages of your program homes? What additional information or training do they need?

If Realtors Used:

- Do you think realtors understand the advantages of FirstEnergy program homes?
- Do you think realtors are adequately promoting the advantages these homes? What additional information or training do they need?
- Could you provide me with the name of the realtor(s) you typically use to sell FirstEnergy program homes?

13. Have you attending any trainings provided through the program? Which ones? How useful was the training? Any suggestions for improving the program? Are additional trainings needed?

- PSD Raters Webinar Series: Sampling--An Overview
- PSD Raters Webinar Series: RESNET New Minimum Rated Features and CFA
- Lights & Appliances: How to Benefit from the Low-Hanging Fruit
- PSD Raters Webinar Series: Measuring Airflow, Duct Testing & Modeling
- Energy Efficiency Measures that Add Little to No Cost to Construction
- ENERGY STAR Q&A
- PSD Raters Webinar Series: Modeling Tips: GSHP, Walk-out Basements, Jumper Ducts, Etc.
- FirstEnergy OH & PA New Homes Programs - Compass 2.6 Update: File Submittal Live Demo
- PSD Raters Webinar Series: Industry Updates (ES revision 6, RESNET Registry, etc)
- PSD Raters Webinar Series: Multifamily Ratings
- IECC 2006 to IECC 2009 to ENERGY STAR V. 3.0
- Industry Updates and Trends
- PSD Raters Webinar Series: Sampling - An overview

14. Which features of the program homes are most beneficial or valuable to the homebuyers? How about the least beneficial or valuable?

15. And which benefits do you promote when marketing these homes?

- If no marketing occurring: Why don't you market your program homes?

16. In your marketing efforts, do you mention that there are rebates for these types of homes? Do you pass the rebate savings along to the home buyer?

17. What do you think FirstEnergy should do to effectively market the benefits of their program homes?

18. Have you received more or fewer inquiries about energy efficient homes in the past year? Why do you think that is?

- Do homebuyers make referrals to your company?

19. Does the ENERGY STAR label provide a sales advantage or disadvantage in the current housing market?

20. What do you think are the biggest challenges when marketing energy efficient homes?

Program Interactions

Now I have a few questions about your interactions with other program actors.

21. Who do you get most of your program information from (e.g., a HERS Rater, FirstEnergy staff or website, a State or National Energy organization, an HVAC contractor, program implementation etc.)? By program information, I mean updates on new home requirements, rebate levels, trainings being offered, etc.

- If from a HERS Rater or HVAC contractor: Which company do you primarily work with?
- IF DID NOT MENTION HERS RATER, ASK: Do you work with a HERS Rater?
- IF YES, ASK: Who do you primarily work with?

22. What is the most critical support the program could provide to program builders and subcontractors in the near future? (Probe to see if technical/field support, consumer marketing, subcontractor training, other preferred) Why do you say that?

23. [IF MENTIONED THEY WORK WITH A HERS RATER]
Tell me about your collaboration/relationship with the HERS Rater(s) you work with.

- What value do Raters offer?
- What is going well?
- What improvements could be made?
- Do you have any issues Raters failing homes? What types of issues?

24. How efficiently is the home certification process performing? Could this be improved in any way? (Probe to see if any issues with field inspections or QA by Providers).

- Are there different stages of the certification process that work better than others? (Probe particular for ENERGY STAR homes, as there are different site visits that need to be made by the HERS Rater.)

25. How well is the rebates payment process working for you?

Overall Program

I just have a few final questions about the program.

26. What do you consider to be the biggest advantages of the program to you from being a program builder?

27. What has been the biggest challenge for you in participating in FirstEnergy's New Homes program?

- (If needed) What about the incremental costs of building more energy efficient homes? Are these a challenge for you, even after FirstEnergy's rebates are considered?
- Are high or low appraisals of your program homes an issue for you?

28. On a scale of 1 to 5, where 1 is very dissatisfied and 5 is extremely satisfied, how would you rate your satisfaction with FirstEnergy's New Homes program? Why do you say that?

Feedback

29. What feedback have you received from customers (positive and negative)? Do they have any suggestions for improving the program? [Probe for measure specific feedback]

30. Have you discussed the program with other builders? What feedback have you received from them (positive and negative)? Do they have any suggestions for improving the program? [Probe for measure specific feedback]

Wrap-up

31. Those are all the questions I have for you. Do you have anything else you want to mention to me in regards to the program?

Thank you for your time. This completes our interview.