Home Performance Program
Evaluation, Measurement, and Verification Report
2013

Prepared for FirstEnergy Ohio Companies:

Ohio Edison Company
The Cleveland Electric Illuminating Company
The Toledo Edison Company

Prepared by:

ADM Associates, Inc.
3239 Ramos Circle
Sacramento, CA 95827
916-363-8383

Table of Contents

List of Tables

List of Equations

1. Executive Summary

During 2013, The Cleveland Electric Illuminating Company (CEI), Ohio Edison (OE), and The Toledo Edison Company (TE) (collectively Companies) implemented the demand side management (DSM) Home Performance Program for the Companies' residential customers in their respective service territories.

Under contract with the Companies, ADM Associates, Inc. (ADM) performed evaluation, measurement and verification (EM&V) activities for the Home Performance Program. The procedures used to perform the EM&V activities described in this report were informed by the approved State of Ohio Energy Efficiency Technical Reference Manual ("TRM")[1] and ADM's previous experience performing EM&V activities for the Companies DSM programs. In addition, the procedures chosen build on information collected during a project initiation meeting and succeeding discussions with Company staff.

This report describes the methodologies, procedures and data tracking systems utilized to conduct program evaluation activities, including data gathering, sampling and analysis methods. The major conclusions and recommendations for each Home Performance subprogram are summarized below.

1.1 Audits

1.1.1 Comprehensive Home Audit

The target market for the Comprehensive Home Audit (CHA) is residential single-family homeowners. The program provides residential customers a comprehensive home energy audit with air infiltration testing through the use of a blower door diagnostic test for improving the thermal integrity of the building envelope. It also evaluates home appliance, lighting and HVAC system efficiencies. In the CHA subprogram, customers pay a discounted fee of $100 for this audit and can elect to have energy efficiency measures installed during the time of the audit and/or home improvement measures installed later by participating home improvement contactors. The Companies have contracted with Honeywell to be the Conservation Service Partner or Provider (CSP) to administer this Program.

The energy audit includes:

[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.

- An evaluation of the home's heating and cooling system, insulation levels, windows, doors, appliances, and lighting;
- A blower door diagnostic test to detect air leaks in the home's building envelope; and
- An energy audit report that recommends specific energy-saving measures appropriate for the home. Customers who choose to implement the recommended measures are entitled to rebates available from the Companies.

Energy efficiency measures that can be direct installed at the time of the home energy audit include:

- ENERGY STAR Compact Fluorescent Lamps (CFLs)
- Low Flow Showerheads
- Faucet Aerators (kitchens and bathrooms)
- Pipe Wrap insulation

Additional home improvement measures that may be recommended at the time a residential energy audit is performed include the following items:

- Roof and Ceiling Insulation
- Wall Insulation
- ENERGY STAR qualified Windows
- ENERGY STAR qualified Ceiling Fan and Light Fixture
- Duct Sealing

A total of 1,531 home retro fit projects were completed in the CHA subprogram in 2013. Participation by operating company is shown in Table 1-1:[2]

Table 1-1: Comprehensive Home Audit Participation by Operating Company

Operating Company	***Participating Households***
CEI	513
OE	713
TE	305
All Companies	1,531

The overall subprogram level estimated gross kWh energy savings and kW peak demand reductions for the CHA program in 2013 are summarized in

[2] Unique project numbers were used to tally participant count. Some projects may span calendar years, in which case the Companies' tracking and reporting system only counts the participant in the year savings first appear for the project.

Table *1-2*

Table 1-2: Comprehensive Home Audit Energy Impacts

Operating Company	***Ex Ante Expected Gross Savings***		***Ex Post Verified Gross Savings***	
	Gross kWh	***Gross kW***	***Gross kWh***	***Gross kW***
CEI	437,000	86.54	404,782	96.85
OE	581,021	163.12	452,438	117.73
TE	229,128	42.25	148,960	37.41
All Companies	1,247,149	291.91	1,006,179	251.99

The gross kWh savings totals shown in

Table *1-2* yield a realization rate for kWh savings of approximately 81%, as determined by the ratio of verified gross kWh savings to expected gross kWh savings. The realization rate for kW reductions was about 86%.

Taken together, the various types of CFLs directly installed through the program accounted for 61% of the total verified kWh savings, ENERGY STAR windows for 30%, and all other measures for the remaining 9%.

1.1.2 Online Audits

During 2013, the Companies continued to offer the Online Audit (OA) Program. An evaluation of the 2013 OA program was conducted that had three main components.

- *Impact Evaluation*. The energy savings of the 2013 OA program were examined for both online and telephone audits using regression analysis of monthly billing data for customers who participated in the program and for a control sample of non-participants.
- *Process Evaluation*. Surveys were used to determine the customers use of the different home energy audit methods and to identify the actual benefits that users realize from each method. Of particular interest was determining the actions customers take as a result of a home energy audit.
- *Persistence Analysis*. Billing data for customers who participated in the OA program in 2010, 2011 and 2012 were analyzed to determine the extent to which their savings

persisted into 2012. Surveys were also used to examine the persistence of the 2010, 2011 and 2012 cohort and to identify the actions they had taken to save energy.

Participants in the 2013 OA program could receive a home energy audit either online or by telephone.

- For an online audit, a participant initiates the audit process and uses *Home Energy Analyzer* software to understand how she/he can become more efficient in using electricity in the home. Online users learned about the *Home Energy Analyzer* primarily through a utility company website and received a customized home energy report.
- A telephone participant usually does not initiate the audit. Rather, telephone participants generally are administered audit questions when they call a customer service center regarding a high bill. A telephone audit user is asked if they are interested in receiving a brochure on energy saving tips in the mail.

A total of 15,157 customers participated in the OA program in 2013 as shown in Table 1-3.[3]

- Of these customers, 10,612 (70 percent) conducted online audits. A third (33 percent) of the online participants conducted level 2 or 3 audits.
- There were 4,545 customers (30 percent of all participants) who participated in telephone audits. Nearly all (97 percent) of the telephone audit participants conducted Level 2 or 3 audits.

Table 1-3: Participation Levels for 2013 OA Program by Utility, Type and Level of Audit

Utility Company	Online Audits			Telephone Audits			All Audits
	Level 1 only	Level 2 or 3	All Online	Level 1 only	Level 2 or 3	All Telephone	
CEI	2,438	1,165	3,603	34	1,342	1,376	4,979
OE	3,527	1,857	5,384	65	2,420	2,485	7,869
TE	1,127	498	1,625	20	664	684	2,309
Total Program	7,092	3,520	10,612	119	4,426	4,545	15,157

Note. Participation counts are for January 1 through December 31, 2013.

As shown in Table 1-4, verified ex post electric savings were 6,254,007 kWh for all home energy audits combined. Of the total kWh savings, 3,657,931 kWh (58.4 percent) were from online audits and 2,596,076 kWh (41.6 percent) were from telephone audits.

[3] Unique project number was used to determine participant counts.

Realization rates for electric savings were 127.4 percent for online audits, 212.1 percent for telephone audits, and 152.7 percent overall. Table 1-4 also shows that verified critical peak demand reduction was 2,697.3 kW. Of the total demand reduction, 1218.8 kW (45 percent) was from online audits and 1478.5 kW (55 percent) was from telephone audits. Table 1-5 shows program-level *ex post* savings by audit type for each operating company and for the three companies combined.

Table 1-4: Summary of Annualized Energy and Demand Savings Impacts

Operating Company	***Ex Ante Savings***		***Ex Post Savings***	
	kWh	***kW***	***kWh***	***kW***
Savings by Utility Company				
CEI	1,344,680	400.5	1,959,299	907.1
OE	2,125,857	636.2	3,438,287	1320.7
TE	623,495	185.3	856,421	469.6
Savings by Type of Audit				
Online Audits	2,870,374	874.4	3,657,931	1218.8
Telephone Audits	1,223,658	347.6	2,596,076	1478.5
Savings for All Audits				
All Audits	4,094,032	1222.0	6,254,007	2,697.3

Table 1-5: Ex Post Program-Level Savings (kWh) and kW Reductions by Operating Company and Audit Method

CEI			
	Telephone	***Online***	***All Audits***
Total kWh Saved	779,621	1,179,678	1,959,299
Total kW Reduced	526.9	380.1	907.1
OE			
	Telephone	***Online***	***All Audits***
Total kWh Saved	1,455,223	1,983,064	3,438,287
Total kW Reduced	717.4	603.3	1320.7
TE			
	Telephone	***Online***	***All Audits***
Total kWh Saved	361,232	495,189	856,421
Total kW Reduced	234.2	235.4	469.6
Totals for All Three Companies			
	Telephone	***Online***	***All Audits***
Total kWh Saved	2,596,076	3,657,931	6,254,007
Total kW Reduced	1478.5	1218.8	2697.3

More energy and demand savings can be realized if more online audit participants can be encouraged to engage the *Online Audit* software application at audit levels 2 and 3. It is recommended that efforts to promote online use of home energy audits emphasize the need to go beyond a Level 1 audit in order to achieve reduced electricity consumption and savings on the customer's monthly electric bill. The Companies should consider increasing the frequency and content of bill inserts that advertise and promote online home energy audits using the Online Audit software.

1.2 Energy Conservation Kits

The Energy Conservation Kits subprogram which was new in 2013 was implemented by Power Direct Energy. The target demographic for the conservations kits was residential single-family homeowners. The Companies provided residential customers with a small kit containing energy saving products. The kits were distributed through:

Direct mail kit requested from the Companies which included:

- ENERGY STAR Compact Fluorescent Lamps (CFLs)
- Smart Power Strips
- Furnace Whistles
- LED Night Lights
- Faucet Aerators (for customers with electric water heaters only)
- Low Flow Showerheads (for customers with electric water heaters only)

The School Education and Kit Program – also new in 2013 – was implemented by AM Conservation Group. AM Conservation/NTC delivered at schools in the Companies' service territory "live performances" for students in kindergarten thru 5th grade to learn about energy conservation. Parents of these students received the opportunity to request an energy conservation kit be sent to their home.

Schools kit included the following energy efficiency measures:

- ENERGY STAR Compact Fluorescent Lamps (CFLs)
- Faucet Aerators
- LED Night Lights

The total number of kits distributed by the Companies in 2013 by type and operating company is shown in Table 1-6.[4]

[4] Unique project numbers were used to tally the total number of kits distributed.

Table 1-6: Total of Kit Types Delivered by Operating Company

Operating Company	*CEI*	*OE*	*TE*	*Total*
Standard Kit	70,662	103,456	33,352	207,470
All Electric Kits	8,065	14,371	4,857	27,293
Schools Kits	667	355	875	1,897
Total Delivered Kits	79,394	118,182	39,084	236,660

Ex post verified electric savings was 94,553,937 kWh annually (a realization rate of 75 percent). *Ex post* verified peak demand reduction was 10,094 kW. *Ex post* gross energy savings (kWh) and peak demand reduction (kW) for the subprogram in the three service territories are reported in Table 1-7.

Table 1-7: Energy Conservation Kits Energy Impacts

Operating Company	*Ex Ante Expected Gross Savings*		*Ex Post Verified Gross Savings*	
	Gross kWh	*Gross kW*	*Gross kWh*	*Gross kW*
CEI	42,324,983	4,227	31,573,249	3,372
OE	63,353,779	6,324	47,449,056	5,064
TE	20,689,152	2,068	15,531,633	1,657
All Companies	126,367,914	12,619	94,553,937	10,094

1.3 New Homes

The Companies sought to increase the energy efficiency of new homes in 2013 by providing incentives to home builders that construct their homes to be 15% to 30% better than the minimum building code standards (IECC 2006 or IECC 2009[5]) and receive ENERGY STAR® certification. The 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

[5] Building code changes in program year 2013 that adopt IECC 2009 will result in homes permitted under both IECC 2006 & IECC 2009 participating in the program.

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 1,111 homes in the service territories of the Companies received rebates through the Residential New Construction Program in 2013.

The number of participating homes by operating company is shown in Table 1-8.[6]

Table 1-8: Participating Homes by Operating Company

Operating Company	***Number of Participants***
CEI	303
OE	678
TE	130
All Companies	1,111

The number of participating builders by operating company is shown in

Table 1-9.

Table 1-9: Builder Participation by Utility

Operating Company	***Number of Participants***
CEI	15
OE	18*
TE	4
All Companies	37

**Final Dataset from Green Compass included three homes with no builder identified*

Ex post gross electric savings were estimated through detailed analysis of program tracking data and participant survey data. ADM verified program savings through REM/Rate by comparing the user-defined reference home as specified in the TRM to the as-built home model generated by the HERS rating company from plan sets and field data.

[6] Unique project numbers were used to tally the total number of participating homes.

Ex post verified electric savings was 2,622,297 kWh annually (a realization rate of 88 percent). *Ex post* verified peak demand reduction was 449 kW. *Ex post* gross energy savings (kWh) and peak demand reduction (kW) for the subprogram in the three service territories are reported in Table 1-10.

Table 1-10: New Homes Energy Impacts

Operating Company	Ex Ante Expected Gross Savings		Ex Post Verified Gross Savings	
	Gross kWh	Gross kW	Gross kWh	Gross kW
CEI	869,269	191	802,136	180
OE	1,791,097	345	1,543,728	241
TE	309,949	34	276,433	28
All Companies	2,970,315	571	2,622,297	449

In addition to the impact evaluations, ADM also implemented a process evaluation to determine how effective the program is in terms of: customer satisfaction, builder and home buyer awareness, and stakeholder interactions. Key findings from the process evaluation of the 2013 Residential New Construction program include:

- Builders have a good understanding of the program requirements.
- The cost of going to ENERGY STAR® Version 3.0 is still viewed as too high for some builders.
- Satisfaction with the program is high among builders, raters and homeowners.
- The participating builders we spoke with plan to have all of their buildings qualify for the program in 2014.
- Raters continue to 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.
- Raters are having a hard time getting builders, contractors, and architects to understand ENERGY STAR® Version 3.0 and how to become compliant.
- Concerns expressed by raters about the dependency the builders have on them have decreased.
- Realtors are influential in the homebuyer's decision to purchase a home.
- Finding certified HVAC contractors has been an issue for some of the builders.

Going into the fourth year, the program is building on the previous years' momentum. Program requirements are now clearer for builders and raters and trainings have been on target, which have been successful in helping move the program forward. Assuming construction picks up in program year 2014, subprogram targets are expected to be met.

1.4 Behavioral Modification

During 2013, the Companies contracted with OPOWER to administer a Behavior Modification (BMod) Program targeted at residential customers. An evaluation of the 2013 BMod program was conducted that had two main components:

- *Impact Evaluation*. The energy savings of the 2013 BMod program were examined using regression analysis of monthly billing data for customers who participated in the program and for a control sample of non-participants.
- *Process Evaluation*. Surveys were used to determine the usefulness of comparative energy usage reports and the actions customers took in response to the information provided.

Participants in the 2013 BMod program received monthly usage reports which contained information about their energy use, compared the household's energy use to that of a group of similar households (both average and most efficient neighbors), and educated them on low-cost measures, practices or behaviors to reduce their energy use. The reports were delivered via the United States Postal Service with the option of also receiving the report through e-mail.

A total of 73,000 customers participated in the BMod program in 2013. Table 1-11 below details participant counts by operating company.[7]

Table 1-11: Participation Levels for 2013 BMod Program by Utility

Utility Company	***Participants***
CEI	24,500
OE	38,500
TE	10,000
Total	73,000

As shown in

[7] Participation counts determined from data supplied by the implementation contractor.

Table 1-12, verified annualized ex post electric savings were 12,792,850 kWh. The realization rate for electric savings was 100 percent.

Table 1-12 also shows that verified critical peak demand reduction was 1,460 kW.

Table 1-12: Summary of Annualized Energy and Demand Savings Impacts

	Ex Ante Savings		***Ex Post Savings***	
	kWh	***kW***	***kWh***	***kW***
Savings by Utility Company				
CEI	10,395,000	1187	8,429,575	962.5
OE	1,176,000	134	3,222,975	367.5
TE	1,160,000	132	1,140,300	130
Total	12,731,000	1,453	12,792,850	1,460

2. Introduction and Purpose of Study

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 Home Performance Program during the 2013 program year. Additionally, this report presents the results of the process evaluation of the program focusing on participant and program staff perspectives regarding the program's implementation.

The research questions derived from the Program objectives listed in the Companies' filings documents that ADM addressed for each of the Home Performance subprograms are presented in this chapter.

2.1 Audits

2.1.1 Comprehensive Home Audit

The research questions for the CHA subprogram are presented below:

- What is the number of customers registering for a home energy audit in 2013? What is the number of home energy audits that are completed in 2013?
- What is the number and types of retrofit jobs that have been recommended by the residential energy auditors? What is the number and types of retrofit jobs that have been completed?
- What is the number of contractors participating in the Program in 2013? What is the rate of jobs completed by each contractor?
- How do customers proceed in completing recommended retrofit jobs? What choices do they make in financing retrofit jobs?
- What is the number of customers that access rebates through the Program in completing retrofit jobs? What is the number of customers that access rebates and services through other utility programs in completing retrofit jobs?
- What are the estimated costs of completed retrofit projects?
- To what extent have contractors increased their capacity to deliver energy efficiency services in Ohio?
- To what extent are customers satisfied with the Program?
- What are the energy savings and peak demand reduction impacts for the measures installed as a result of the energy audits and rebated retrofit jobs completed in response to audit recommendations?

2.1.2 Online Audit

The evaluation of the 2013 OA program had three main components.

- **Impact Evaluation**. The energy savings of the 2013 OA program were examined for both online and telephone audits using regression analysis of monthly billing data for customers who participated in the program and for a control sample of non-participants.
- **Process Evaluation**. Surveys were used to determine the customers use of the different home energy audit methods and to identify the actual benefits that users realize from each method. Of particular interest was determining the actions customers take as a result of a home energy audit.
- **Persistence Analysis**. Billing data for customers who participated in the OA program in 2010, 2011 and 2012 were analyzed to determine the extent to which their savings persisted through 2013. Surveys were also used to examine the persistence of the actions taken to save energy by 2010, 2011 and 2012 OA participants.

The impact evaluation addressed the following research questions.

- To what extent has the Online Audit program resulted in electric energy savings for participating customers (compared to similar nonparticipating customers) in each of the three operating companies, as measured by annualized energy savings (kWh) and electricity demand reductions (kW)?
- How do the two energy audit methods – online vs. telephone – compare in producing electric energy savings for customers?
- How do the three levels of audit involvement compare in producing electric energy savings?
- How effective is the program for online audit users compared to telephone audit users at each level of audit involvement?
- To what extent have energy savings persisted from 2010, 2011 and 2012 into 2013?
- What are the most likely explanations for differences in savings between the telephone and online audit methods?

The goal of the process evaluation component was to determine (a) the differences in information that customers receive from the two types of audit methods (b) the differences in information that customers receive from the different levels of an online audit, (c) the actions taken by customers as a result of the different types and levels of a home energy audit, and (d) the extent to which these actions persisted from 2010, 2011 and 2012

through 2013. The process evaluation was therefore framed by the following research questions.

- How did customers learn of the availability of the home energy audit?
- How is the information provided in a telephone audit different from the information provided in an online audit?
- How does online information provided in a Level 1 audit different from the online information provided to customers in a Level 2 or Level 3 audit?
- What actions did telephone audit users take to save energy and how did these actions differ from the energy saving actions of online audit users?
- How did the energy saving actions of online audit users at Level 1 differ from the energy saving actions of online audit users at Levels 2 and 3?

The purpose of the persistence analysis was to analyze customer billing data to determine the extent to which savings achieved by participants in the OA program during 2010, 2011 and 2012 persisted through 2013. Surveys were also used to collect information with which to examine the persistence of the actions taken to save energy by 2010, 2011 and 2012 OA participants (i.e., to determine the extent to which customers who initiated energy saving actions in 2010, 2011 and 2012 continued with those practices through 2013).

2.2 Energy Conservation Kits

The research questions for the Energy Conservation Kits subprogram are presented below:

- How many customers requested kits?
- What are the total number of measures installed by customers and the location of installed lighting measures?
- How much energy savings can be attributed to the Program?
- How much peak demand reduction can be attributed to the Program?
- How satisfied were customers with each measure and the program as a whole?

2.3 New Homes

The impact evaluation component in 2013 estimated gross energy savings (kWh) and peak demand reduction (kW) was 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 was 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 was to determine how effective the program is in terms of customer satisfaction, builder and home buyer awareness, and stakeholder interaction. The process evaluation was 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 were 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 did builders feel are the greatest challenges or obstacles to program participation?
- Which individual measure types were generating the greatest kWh and kW savings?

2.4 Behavioral

The impact evaluation component in 2013 estimated energy savings (kWh) and peak demand reduction (kW) as framed by the following research questions.

- To what extent has the 2013 Behavioral Modification program resulted in electric energy savings for participating customers (compared to similar non-participating customers) in each of the three Ohio utilities, as measured by annualized reductions in kilowatt hours (kWh) per customer?

- What kinds of energy efficiency changes (behavioral or structural) made by customers are responsible for producing the observed energy savings?
- What percentage of home energy efficiency changes made by Home Electricity Report recipients are behavioral versus structural?

The goal of the process evaluation component was to determine participant satisfaction and program efficacy. The process evaluation was framed, therefore, by the following research questions.

- Did customers remember receiving the Home Energy Reports (HER), and if so, had they done anything to save electricity in the home in response to the information in the report?
- If customer did not do anything in response to the HER, why not?
- How satisfied are customers with the Behavioral Modification program?

3. Program Description

This chapter presents a description of each of the four subprograms that comprise the Home Performance Program.

3.1 Audits

3.1.1 Comprehensive Home Audit

The CHA sub program, which was administered by Honeywell, had three main elements during 2013:

- Residential customers paid $100 for their subsidized comprehensive home audit.[8]
- At the time of the energy audit, several direct install measures were available at no charge to the customer.
- Energy auditors would also recommended additional, rebate eligible, improvements that could be installed by a participating home improvement contractor.

The energy audits were performed by contractors certified through the Building Performance Institute (BPI). The audit service included the following:

- Evaluation of the home's heating and cooling system, insulation, windows, doors, appliances, and lighting;
- Diagnostic testing with a blower door to detect air leaks in the home's building envelope; and
- Providing an energy audit report that recommends energy-saving projects and measures appropriate to the home.

As part of an audit, the auditor could install, for no additional charge, several types of measures. These direct install measures included:

- ENERGY STAR® Compact Fluorescent Lamps (CFLs).
- Water reduction measures (low flow showerheads, faucet aerators)
- Pipe wrap insulation

In addition, energy auditors might also recommended other measures to improve energy efficiency that could be installed by a participating home improvement contractor. The Companies offered rebates for having the following types of measures installed by a contractor:

- Attic Insulation, with rebates up to $50

[8] The Companies paid the remainder of the non-discounted fee of $350.

- Wall Insulation, with rebates up to $150
- Duct Sealing, with rebates up to $75
- ENERGY STAR Qualified Window, with a rebate of $50 per window
- ENERGY STAR Qualified Ceiling Fan, with a rebate of $25 per fan

The rebated measures could be installed by participating home improvement contractors at the customer's option. Customers could also receive a recommendation from the home energy auditor for installing an ENERGY STAR qualified Ceiling Fan with an ENERGY STAR Light Fixture Kit.

3.1.2 Online Audits

The Online Audit Program, first implemented in Ohio in December 2009, allows residential customers who reside in single family or multi-family housing to analyze their home energy use and billing history at no cost to themselves. Customers of the Companies can take a home energy audit at any time during the year, either by accessing an online software application (i.e., the *Home Energy Analyzer*) through the Companies' website or by conducting a home energy audit by telephone with assistance from a Contact Center Customer Service Representative.

Online Audits

In an online audit, a customer uses the *Home Energy Analyzer* online software to develop a personalized assessment of her/his home energy use, to see how their energy use compares to that of similar homes, and to identify ways to improve the efficiency of their energy use. A user controls the depth of the investigation into home energy use and the exploration into ways to save energy. The *Home Energy Analyzer* software provides for three levels of energy usage analysis, depending on how deeply a customer chooses to go. Using the Online Audit, a customer can create a report that lists the major sources of energy usage in their home, learn how home weatherization can save money every month, and identify energy efficient appliances.

In a Level 1 online audit, a customer accessing the *Home Energy Analyzer* answers various questions regarding a customer's home and energy usage. The software automatically analyzes the answers that the customer gives on the home profile and generates a Level 1 audit report. This shows the customer how their electricity use compares to that of similar homes in the area. A pie chart is included in the report that shows how energy is distributed across various end uses in the home. A Level 1 audit report also provides the customer with basic energy saving ideas and identifies top ways the customer can save energy.

At Level 2, the customer completes a home appliance profile and the software generates a more detailed Level 2 report on ways to save energy. Alternatively, the customer can engage in a Level 3 online audit which allows the customer to explore a multitude of topics on saving energy in the home. Level 3 topics include weatherization, heating, cooling, hot water, lighting, kitchen uses, etc. The software also allows the user to explore no-cost/low-cost ways to save energy immediately, ways to save energy that require some financial investment but which will pay off in time, and ways to save that would not be cost-justified for the customer. A Level 2 or Level 3 audit will provide the customer with a customized Home Energy Analysis Report in which estimates of energy costs and savings and energy saving options are based on the information the customer provided.

Customers who complete Levels 2 and 3 receive a Home Energy Analysis report. More information is provided in a Level 3 report compared to a Level 2 report. In general, a Home Energy Analysis Report provides a summary of annual energy costs associated with the customer's appliances, a monthly energy use home comparison, and specific energy saving opportunities are identified for the customer's home.

Telephone Audits

A telephone home energy audit is typically initiated when a customer telephones the Companies' Customer Service Center with questions about an electricity bill. A Customer Service Representative (CSR) explains the bill to the customer in terms of the key factors that contribute to the customer's energy use. The customer is offered a home energy audit that includes a review of the customer's billing history. For the telephone audit, a CSR walks a customer through the audit application, inputting the customer's data for them. There are three levels to a telephone audit, similar to that of the online audit procedure.

Once a telephone audit participant's data has been entered, the CSR provides the conservation and savings findings over the telephone. During the telephone conversation, the customer service representative will suggest ways in which the customer can save energy, given identification of the main energy uses in the home. The customer service representative will estimate what the customer's bill should be in light of the billing history review and the home/appliance profile and offer a judgment as to whether the customer's electric bill is reasonable or not.

A telephone audit typically concludes with a customer service representative offering to send the customer literature on how to save energy in the home. Materials offered to telephone audit participants by mail include the following:

- A 2-page document titled "*Understanding Electricity Usage and Costs*" that shows the customer a formula for costing out kWh values and a chart of

appliances with columns for Watts, average hours of use, average kWh used per month and average cost for that appliance;

- A 21-page document titled "*More than 100 ways to improve your electric bill*"; and
- A computer link to the *Home Energy Analyzer*.

Although a telephone audit resembles a Level 2 / 3 online audit in that the customer gets a review of usage history and feedback on basic ways to save energy, the customer does not get a written, customized home energy analysis report. Rather, customers receiving a telephone audit are offered a brochure on tips for saving energy in the home.

3.2 Energy Conservation Kits

The Energy Conservation Kit Program provides the Companies' customers with energy efficiency measures and educational materials to encourage residential energy usage reduction. The target market for the Program is residential single-family homeowners.

Kits are provided to customers upon request, and the contents of kits vary slightly depending on the customers' water heating fuel source. Participants receive measure descriptions and installation guidelines with their kits, and are able to choose which measures to install. The conservation kits also contain educational materials regarding residential energy saving behaviors, which encourage kit recipients to further reduce their electricity usage. Additionally, the kits include promotional materials for other of the Companies' energy efficiency incentive opportunities such as appliance recycling rebates and ENERGY STAR® appliance rebates. This practice takes advantage of the unique kit distribution marketing channel, and encourages cross-participation in multiple of the Companies' programs.

The Energy Conservation program requires customers to request kits via the electronic application on the Ohio Energy Kit website or by calling a toll-free telephone number.[9] The Companies verify that the prospective participant is a customer of one of the participating EDCs, and that they have not already received a kit during the program year. Kits are typically shipped to customers within a few weeks of the request date. The conservation kits include a help line telephone number that allows participants to report measure defects or ask questions regarding the program and specific measures. Additionally, Power Direct sends a reminder postcard to participants after the kits are shipped. This encourages participants to use the items they have received, thereby

[9] The Energy Conservation Kit enrollment form can be found here: https://www.ohioenergykit.com/EnrollmentRequest.aspx

increasing measure installation rates. A copy of this reminder postcard is provided for reference in Appendix C.

The School Education and Kit Program provide an opportunity for parents or guardians of students in grades kindergarten thru 5th grade to request an Energy Conservation Kit after the school has participated in the program. The program includes a 25-minute performance on energy conservation and corresponding curriculum for the classroom. Parents are able to request a kit through an electronic application on the Student Energy Kit website or request a kit through permission slip with their teacher. Kits are shipped to the student's homes within a few weeks of the request.

3.3 New Homes

In 2013, 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, plus an additional $0.10/kWh saved 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 modeling software output. Qualifying homes will be built to ENERGY STAR® Version 3.0 requirements, be at least 15 percent more efficient than the 2009 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.

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 PSD. 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 2009). 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 PSD. 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.

3.4 Behavioral Modification

The Companies contracted with OPOWER to administer a behavioral based program targeted at residential customers. The OPOWER program is designed to generate greater awareness of energy use and of how to manage energy use through energy efficiency education in the form of Home Energy Reports (HERs). The program provided customers with information about their energy use, compared the household's energy use to that of a group of similar households (both average and most efficient neighbors), and educated them on low-cost measures, practices or behaviors to reduce their energy use. It was expected that through this education, customers implemented measures or adopted practices that lead to more efficiency energy use in their homes.

Customers received reports about energy use by U.S. mail or email on a monthly basis.

4. Methodology

This chapter provides a description of the methodology applied by ADM in the evaluation of the 2013 Home Performance Program. In this chapter, each section is divided into subsections: impact evaluation methodology and process evaluation methodology.

4.1 Evaluation Methodology: Audits

4.1.1 Comprehensive Home Audits

Impact Evaluation Methodology

ADM used an evaluation audit strategy in performing an impact evaluation of the program. The audit strategy involved four major activities:

- Ex ante review
- Customer and contractor surveys
- On-site verification visits
- Performing impact analysis calculations using the TRM algorithms

Using the audit strategy, ADM estimated energy savings and demand reduction for each program measure using the TRM algorithms with data obtained from the program's tracking database and augmented as necessary from site visits, surveys, and contractor job invoices. The evaluation audit strategy is discussed in more detail in the following sections.

Ex Ante Review

During June 2013, ADM reviewed all of Honeywell's savings and demand reduction calculations for the program. This review was followed by ongoing dialogue to clarify the program's rebate policies and savings calculations. As a result of this dialogue, the Companies and Honeywell modified some of the program's rebate policies and savings calculations to be more consistent with the TRM and the Joint Utility Comments documents, where applicable.

The Ex Ante review also helped ADM reach an understanding of the additional data needed to verify claims for program energy savings and demand reduction. Honeywell provided all necessary data points in order to calculate savings per the algorithms in the TRM in a supplemental data set. The list below outlines the necessary data ADM needed provided by Honeywell prior to the delivery of the final data set.

Insulation Improvement

- Baseline R-value of the pre-existing ceiling and/or wall insulation
- New R-value after ceiling or wall insulation has been added
- Square footage of insulated area
- SEER of Air Conditioning equipment
- COP of Heat Pump

Window Retrofits

- Average U factor value of the windows installed (manually verified by Honeywell)
- Number of ENERGY STAR windows installed
- Square footage of the windows installed

Water Measures

- GPM ratings of installed aerators and showerheads
- R-Value of pipe wrap installed
- Verification of water heater as electric or gas

After the close of the program year, the Companies provided the tracking system data for the program and Honeywell provided the additional technical information required to verify savings. ADM reviewed these data and cleaned and edited the data for purposes of analysis. The cleaning and editing involved:

- Verification of rebate status as completed
- Verification of measure rebate requirements (e.g. ENERGY STAR qualified windows and ceiling fans) for completed rebate applications
- Identification of duplicate data entries
- Identification of cases with incomplete data (e.g. no model number provided)

Once the data review had been completed, ADM notified Honeywell and the Companies of the results of the data review and appropriate data cleansing steps, pending receipt of information from Honeywell in a timely fashion.

The per unit ex ante estimates of kWh savings and kW reduction for Comprehensive Home Audit are shown in Table 4-1.

Table 4-1: Ex Ante Estimates of per Unit Annual kWh Savings and kW Reduction for Comprehensive Home Audit

Measure	kWh	kw	Source
12/22/33 Watt 3-way CFL	*44.9*	*0.005*	TRM Algorithm
13 Watt CFL (60 watt)	*41.8*	*0.005*	TRM Algorithm
14W Globe CFL	*45.1*	*0.005*	TRM Algorithm
20 Watt CFL (75 watt)	*44.2*	*0.005*	TRM Algorithm[10]
25 Watt CFL (100 watt)	*51.0*	*0.006*	TRM Algorithm
7W Candelabra CFL	*22.5*	*0.003*	TRM Algorithm
9W Candelabra CFL	*29.0*	*0.005*	TRM Algorithm
Bath Aerators	*42.0*	*0.005*	TRM Algorithm
Kitchen Aerators	*24.5*	*0.003*	TRM Algorithm
EHW Pipe Insulation	*25.0*	*0.003*	TRM Algorithm
Low Flow Showerheads	*204.1*	*0.026*	TRM Algorithm
Attic Insulation*	*243*	*0.072*	TRM Algorithm
Wall Insulation*	*216*	*0.031*	TRM Algorithm
Duct Sealing*	*65*	*0.034*	TRM Algorithm
ENERGY STAR Windows*	*389*	*0.118*	TRM Algorithm
*Due to the many variables involved in the savings calculations, the values presented are the average savings per site measure			

Customer Surveys, Contractor Surveys, and Site Visits

The data collection process consisted of interviews with customers, site visits at the homes of a subset of these customers and interviews with contractors.

Customer Surveys

A customer survey was conducted to verify CFL in-service rates (ISR) for the various CFL measures installed and to estimate annual CFL hours of operation.[11] Any other measures on record as installed by the program were also verified with customers. A random sample of customers was selected for the survey. Customers with email addresses were administered an online survey, and to avoid sample selection bias, customers without email addresses were administered a phone survey. During the online and phone surveys ADM generated a list of homeowners who were willing to participate in an on-site verification visit.

[10] Ohio TRM algorithm modified by ADM shelving study shown in appendix C

[11] Survey instrument found in Appendix B

On-Site Verification Visits

On-site verification visits were conducted to verify insulation (attic and/or wall), ENERGY STAR windows, and water heating measures (faucet aerators, low flow showerheads and pipe wrap). Data was collected to verify the values needed as inputs for computing energy and demand savings using the relevant Ohio TRM algorithms. The installation of other measures installed in customers' homes by the Program (e.g., CFLs) was also verified in the field verification sample. ADM field staff conducted on-site visits expressly to collect the following data for the following measures, depending on the measures installed and the heating and cooling equipment in the home:

On-site Insulation & Duct Sealing

- SEER rating of the central air conditioner
- Capacity of the central air conditioner in BTUH
- COP of the heat pump
- Baseline R-Value of the insulation (interview contractor or home owner)
- Upgraded R-Value of the insulation installed
- Square footage of the area insulated

ENERGY STAR Windows

- U ≤ 0.30 (verification of triple pane windows installed)
- Number of ENERGY STAR windows installed
- Square footage of the windows installed

Water Measures

- ISR verification of faucet aerators and low-flow showerheads
- Verification of GPM ratings of installed aerators and showerheads
- R-Value of pipe wrap installed
- Visual verification of pipe wrap installed and conformation of approximate footage.
- Verification of water heater as electric or gas
- Water heater size and type. (e.g. instant, conventional)

Impact Analysis Methods

For each Comprehensive Home Audit measure installed in 2013, total energy (kWh) savings and total peak demand (kW) reduction for that measure will be determined as a function of the number of measures verified as being installed and the savings estimated per measure. The algorithms utilized by ADM to determine total energy savings and total peak demand reduction are reviewed in this section for the following measures:

- CFLs categorized by type and wattage

- Kitchen and bathroom faucet aerators
- Low flow showerheads
- Pipe wrap
- Attic and wall insulation
- Duct sealing
- ENERGY STAR qualified windows
- ENERGY STAR qualified ceiling fans

The data elements needed to verify per-unit savings for the program's energy audit measures, as described below, will either be obtained from Honeywell's tracking and reporting database, or obtained by ADM through onsite visits to a sample of customer homes, estimated from surveys with samples of customers, or from job invoices obtained from a sample of the contractors as discussed in the last section.

Compact Fluorescent Lamps (CFL)

Energy and demand savings for CFLs were calculated using the TRM algorithms for residential direct installation of ENERGY STAR CFLs using an early replacement scenario.[12]

Equation 1: CFLs Calculation of Annual Energy Savings

kWh Savings = (ΔWatt/1,000)*ISR*Hours*WHFe

Where:

ΔWatts = CFL watts * delta watts multiplier;

CFL watts = Wattage of installed CFL, as verified

Delta watts multiplier = for general purpose bulbs;

15 watts or less = 3.25 (From TRM)

16-20 watts = 2.45 (Determined by ADM's Lighting Shelving Study)

21 watts or more = 2.06 (From TRM)

For all Specialty bulbs = 3.25 (From TRM)

ISR = In Service Rate = .81 (From TRM)

Hours = Average hours of use per year = 1040 (From TRM)

[12] 2010 Ohio Technical Reference Manual, August 6, 2010. Vermont Energy Investment Corporation, pp. 17-21.

WHFe= Waste Heat Factor for energy = 1.07 (From TRM) [13]

Equation 2: CFL Calculation of Summer Coincident Peak Demand Savings

ΔkW = ((ΔWatts)/1000)*ISR*WHFd*CF

Where:

WHFd = Waste Heat Factor for Demand[14]

= 1.21

CF = Summer Peak Coincidence Factor

= 0.11

Low Flow Showerheads

Energy and demand savings for low flow showerheads were calculated using the TRM algorithms for residential low flow showerheads in which the Program intends for auditors to implement a direct installation/early replacement[15] policy. Only savings pertaining to electric hot water heating were calculated.

Equation 3: Low Flow Showerheads Calculation of Annual Energy Savings

ΔkWh = ISR * (GPMbase - GPMlow) * kWh/GPMreduced

Where:

ISR = verified In Service Rate as verified by ADM onsite visits and surveys.[16]

GPMbase = Gallons per minute of baseline showerhead

= 2.87 (From TRM)[17]

GPMlow = Gallons per minute of low flow showerhead[18]

kWh/GPMreduced = Assumed kWh savings per GPM reduction[19]

= 173

[13] Parameter to account for effects on heating/cooling from efficient lighting

[14] Parameter to account for cooling savings from efficient lighting

[15] 2010 Ohio Technical Reference Manual, August 6, 2010. Vermont Energy Investment Corporation, pp. 93-96.

[16] Assumed value is 1.0, based on direct install Program policy.

[17] As stipulated by the Ohio TRM for a baseline standard showerhead; see footnote 236 on p. 93 of the Ohio TRM.

[18] This rate was captured by ADM through install verification visits and participant surveys.

[19] Stipulated by the approved Ohio TRM with VEIC replies to Joint utility comments

Equation 4: Low Flow Showerheads Calculation of Summer Coincident Peak Demand Savings

$$\Delta kW = \Delta kWh/Hours*CF$$

Where:

Hours = 29

CF = Summer Peak Coincidence Factor

= 0.00371

Faucet Aerators

Energy and demand savings for faucet aerators were calculated using the TRM algorithms for residential low flow faucet aerators in which the program intends for auditors to directly install.[20] Only savings pertaining to electric hot water heating were calculated. The auditor may install aerators for either kitchen or bathroom faucets, or both.

Equation 5: Faucet Aerators Calculation of Annual Energy Savings

$$\Delta kWh = ISR * ((((GPMbase - GPMlow)/GPMbase) * \#\ people * gals/day * days/year * DR)/F/home)*8.3*(Tft – Tmains)/1{,}000{,}000)/ DHW\ Recovery\ Efficiency/ 0.003412$$

Where:

ISR = verified In Service Rate as verified by ADM onsite visits and surveys.[21]

GPMbase = Gallons per minute of baseline faucet

= 2.2[22]

GPMlow = Gallons per minute[23] of low flow faucet[24]

people = Average number of people per household

= 2.46[25]

[20] 2010 Ohio Technical Reference Manual, August 6, 2010. Vermont Energy Investment Corporation, pp. 89-92.

[21] Assumed value is 1.0, based on direct install Program policy.

[22] As stipulated by the Ohio TRM; see footnote 227 on p.90 of the Ohio TRM.

[23] This rate was captured by ADM through install verification visits and participant surveys.

[24] Assumed value is 1.5 for kitchen faucets and 1.0 for bathroom faucets, based on Program installation policy.

[25] As stipulated by the Ohio TRM; see footnote 228 on p.90 of the Ohio TRM.

Gals/day = Average gallons per person per day used by all faucets in the home = 10.9[26]

Days/year = 365

DR = Percentage of water flowing down the drain

= 63%[27]

F/home = Average number of faucets in the home

= 3.5[28]

8.3 = Constant to convert gallons to pounds

Tft = Assumed temperature of the water used by faucet

= 80[29]

Tmains = Assumed temperature of water entering house

= 57.8[30]

DHW Recovery Efficiency = Recovery efficiency of electric hot water heater

= 0.98

0.003412 = Constant to convert MMBtu to kWh

Equation 6: Faucet Aerators Calculation of Summer Coincident Peak Demand Savings

$$\Delta kW = \Delta kWh/Hours*CF$$

Where:

Hours = 21

CF = Summer Peak Coincidence Factor

= 0.00262

[26] As stipulated by the Ohio TRM; see footnote 229 on p.90 of the Ohio TRM.

[27] If water is collected in a sink, a faucet aerator will not result in any saved water.

[28] As stipulated by the Ohio TRM; see footnote 231 on p.90 of the Ohio TRM.

[29] As stipulated by the Ohio TRM; see footnote 232 on p.90 of the Ohio TRM.

[30] As stipulated by the Ohio TRM; see footnote 233 on p.90 of the Ohio TRM.

Pipe Wrap

Energy and demand savings for adding insulation to un-insulated domestic hot water pipes were calculated using the TRM algorithms for domestic hot water pipe insulation in which the program intends for auditors to directly install.[31] Only savings pertaining to electric hot water heating were calculated. Care was taken to insure that savings are not over reported due to interactive effects.

Equation 7: Pipe Wrap Calculation of Annual Energy Savings

$$\Delta kWh = (1/Rexist - 1/Rnew) * (L*C) * \Delta T * 8{,}760)/\eta DHW/3413$$

Where:

Rexist	= R-value of un-insulated pipe = 1.0[32]
Rnew	= R-value of hot water pipe after being wrapped with insulation.
L	= Length of pipe wrapped by insulation from water heater up to the first elbow
C	= Circumference of pipe wrapped by insulation in feet
ΔT	= 65° F [33]
8,760	= Number of hours in a year.
ηDHW	= Recovery efficiency of electric hot water heater = 0.98[34]
3,413	= Conversion from Btu to kWh.

Equation 8: Pipe Wrap Calculation of Summer Coincident Peak Demand Savings

$$\Delta kW = \Delta kWh/8760$$

Where:

ΔkWh	= Savings from pipe wrap installation
8760	= Number of hours in a year

[31] 2010 Ohio Technical Reference Manual, August 6, 2010. Vermont Energy Investment Corporation, pp. 97-99.

[32] See Ohio TRM, p. 97, footnote 250.

[33] Average temperature difference between supplied water and outside air temperature = (see Ohio TRM, p. 97, footnote 251).

[34] See Ohio TRM, p.97, footnote 252.

Insulation

Energy and demand savings for improving the insulation of attics, ceilings, and walls were calculated using a single set of algorithms in the TRM that apply equally to retrofitting the insulation in attics, roofs, ceilings, and walls.[35] Savings were calculated for both cooling and heating if an electric heat pump is used by the customer. The program accomplishes domestic insulation retrofits through participating home improvement contractors hired by customers who decide to implement recommendations made by the home energy auditors.

Equation 9: Insulation Calculation of Annual Energy Savings

$$\Delta kWh = ((1/Rexist - 1/Rnew) * CDH * DUA * Area/1000/\eta Cool$$

Where:

Rexist = R-value of baseline insulation

Rnew = R-value of improved insulation

CDH = Cooling Degree Hours

DUA = Discretionary Use Adjustment[36]

Area = Square footage of insulated area

ηCool = SEER of air conditioning equipment

Equation 10: Insulation Calculation of Summer Coincident Peak Demand Savings

$$\Delta kW = \Delta kWh/FLHcool * CF$$

Where:

FLHcool = Full load cooling hours[37]

CF = 0.5[38]

Equation 11: Insulation Calculation of Annual Energy Savings for Electric Heating

$$\Delta kWh = ((1/Rexist - 1/Rnew) * HDD * 24 * Area/1000/\eta Heat$$

[35] 2010 Ohio Technical Reference Manual, August 6, 2010. Vermont Energy Investment Corporation, pp. 36-39 and pp. 100-103.

[36] This is a parameter to account for the fact that people do not always operate air conditioning systems when the outside temperature is greater than 75° F = 0.75 (see Ohio TRM, p. 37, footnote 74).

[37] This is a location dependent variable which depends on customer's location (defined by zip code) and corresponding FLH value in look-up table.

[38] See Ohio TRM, p. 38, footnote 76.

Where:

HDD = Heating Degree Days[39]

ηHeat = COP of electric heating equipment (resistance or heat pump)

Duct Sealing

Energy and demand savings for duct sealing retrofits were calculated using Evaluation of Distribution Efficiency algorithms in the TRM.[40] Savings will be calculated for cooling and electric heating (resistance or heat pump). The program accomplishes duct sealing retrofits through home improvement (market) contractors hired by customers who decide to implement recommendations made by the Honeywell auditors.

Equation 12: Duct Sealing (Air Conditioning) Calculation of Annual Energy Savings

$$\Delta kWh = ((CFM50_{DLbefore} - CFM50_{DLafter}) * 60 * CDH * DUA * 0.018/1000/\eta Cool$$

Where:

$CFM50_{DLbefore}$ = Baseline blower door test results[41]

$CFM50_{DLafter}$ = Blower door test results after duct sealing[42]

60 = Constant to convert cubic feet per minute to cubic feet per hour

CDH = Cooling Degree Hours[43]

DUA = Discretionary Use Adjustment[44]

0.018 = Volumetric heat capacity of air ($Btu/ft^3\ ^oF$)

ηCool = SEER of air conditioning equipment[45]

[39] This is a location dependent variable which depends on customer's location (defined by zip code) and corresponding HDD value in look-up table.

[40] 2010 Ohio Technical Reference Manual, August 6, 2010. Vermont Energy Investment Corporation, pp. 108-114.

[41] Based on ADM review of contractor invoices

[42] Ibid.

[43] This is a location dependent variable which depends on customer's location (defined by zip code) and corresponding CDD value in look-up table.

[44] This is a parameter to account for the fact that people do not always operate air conditioning systems when the outside temperature is greater than 75° F = 0.75 (see Ohio TRM, p. 37, footnote 74).

[45] Based on ADM review of contractor invoices

Equation 13: Duct Sealing (Air Conditioning) Calculation of Summer Coincident Peak Demand Savings

$$\Delta kW = \Delta kWh/FLHcool * CF$$

Where:

FLHcool = Full load cooling hours[46]

CF = 0.5[47]

Equation 14: Duct Sealing (Air Conditioning) Calculation of Energy Savings for Electric Heating

$$\Delta kWh = ((CFM50_{DLbefore} – CFM50_{DLafter}) * 60 * 24 * HDD * 0.018/1000/\eta Heat$$

Where:

$CFM50_{DLbefore}$, $CFM50_{DLafter}$, and HDD are the same as previously defined.

ηHeat = Coefficient of Performance of heating equipment[48]

ENERGY STAR Windows

Energy and demand savings for the purchase of ENERGY STAR windows were calculated using a deemed savings approach, as specified in the TRM for electric heating and cooling savings.[49] The TRM specifies that all deemed savings values for ENERGY STAR windows are per 100 square feet of windows and depends on the type of heating and cooling equipment in the home, as shown in Table 4-2.

Table 4-2: Deemed Savings Values for ENERGY STAR Qualified Windows

Type of Energy Savings	***Average Annual kWh Savings (per 100 square feet of ENERGY STAR windows)***	***Average Summer Coincident Peak kW Savings (per 100 square feet of ENERGY STAR windows)***
Heating Savings (Electric Resistance)	302	NA

[46] As previously defined

[47] See Ohio TRM, p. 112, footnote 282.

[48] Based on ADM review of contractor invoices.

[49] 2010 Ohio Technical Reference Manual, August 6, 2010. Vermont Energy Investment Corporation, pp. 115-117.

Heating Savings (Heat Pump)	237	NA
Cooling Savings (Central AC)	126	0.063

ADM visited a sample of customer homes to verify that the windows installed were ENERGY STAR qualified and met U factor requirements for Ohio's northern climate zone. Energy and demand savings for ENERGY STAR qualified windows were computed as the product of the deemed savings values associated with the heating and cooling equipment in the home and the square footage of ENERGY STAR windows installed.

Impact Analysis Summary

Table 4-3 summarizes the impact analysis approach and relevant evaluation question to be determined for each energy savings audit measure.

Table 4-3: Impact Analysis Summary of Impact Evaluation Questions and Methods

Evaluation Question	***Data Collection Methods***	***Data Analysis Method***
Energy savings per rebated audit measure?	Desk review; customer survey; on-site visits; tracking database.	TRM algorithms
Demand savings per rebated audit measure?	Desk review; customer survey; on-site visits; tracking database.	TRM algorithms

Process Evaluation Methodology

NMR completed the following research activities as part of the process evaluation for CHA:

Twenty-six semi-structured in-depth interviews

- Two with program staff and implementation contractors (collectively referred to in this report as program managers).
- Fourteen with contractors who submitted 15 or more rebates (referred to in this report as active participating contractors)
- Ten with contractors who submitted fewer than 15 rebates (referred to in this report as less active participating contractors)

In-Depth Interviews

The in-depth interviews focused on identifying implementation issues and concerns relating to the CHA program. General topics included:

- Program goals and objectives
- Rebates
- Marketing
- Training
- Program strengths and weaknesses

Separate interview guides were tailored to the three groups of respondents targeted for feedback program management staff from the Companies and the implementation contractor Honeywell, active participating contractors, and less active participating contractors.

Twenty-six individuals from 26 organizations involved in the program participated in the in-depth interviews. NMR conducted two interviews with program staff, 14 interviews with active participating contractors, and ten interviews with less active participating contractors. Contact information was provided by Honeywell. Contractors included in the active group submitted at least 15 rebates to the program, while less active contractors submitted fewer than 15 rebates to the program. All interviews were conducted in December 2013 via telephone by NMR staff. Most lasted between 15 and 45 minutes except for those with the Companies and Honeywell, which lasted one hour.

Program Staff Interviews

NMR completed one in-depth interview with a program staff member and one interview with the implementation contractor. Individuals interviewed included the Companies' program manager and the Honeywell program manager.

Contractor Interviews

The selection of contractors included in the interviews was based on the number of rebate applications submitted to the program. The evaluation team classified contractors as active or less active based on the number of rebate applications they submitted to the program.

- Active contractors submitted at least 15 rebate applications in 2013.
- Less active contractors submitted 14 or fewer applications in 2013.

Window installation contractors represent one-half (12 of 24) of all contractors interviewed. When including contractors who installed windows in addition to insulation (17%), two-thirds (67%) of all contractors interviewed installed windows as part of the program. The contractors interviewed as part of the active contractor group submitted a total of 1,428 rebate applications, while less active contractors interviewed submitted a

total of 33 rebate applications. Combined, all contractors interviewed represent 55% of all rebates submitted to the program in 2013 presented in Table 4-4.

Table 4-4: Rebate Applications Submitted by Contractor Sample

PY 2013	Active Contractors	Less Active Contractors	Combined Contractors
Total Number of Contractors	22	135	157
Contractors Interviewed	14	10	24
Total Number of Applications	2,465	208	2763
Applications Submitted by Sample	1,428	33	1461
Percent of Total Applications	58%	16%	55%

4.1.2 Online Audits

Impact Evaluation Methodology

The activities involved in conducting the impact evaluation of energy and demand savings included the following.

- Specifying a regression model with which to analyze energy consumption of households and how participation in the OA program affected electricity use;
- Preparing billing and weather data;
- Estimating the coefficients of regression models, using customer billing data and actual weather data for Ohio locations;
- Using the results from the regression analysis to determine weather-sensitive and non-weather sensitive kWh savings and annual kWh savings;
- Applying kW factors independently to weather sensitive kWh and non-weather sensitive kWh savings values to determine peak kW reductions.

Each of these activities is discussed in turn.

Specification for Regression Modeling

To determine the savings resulting from the 2013 OA program, a “difference in differences” method was used for the analysis. With this method, changes in energy use for customers receiving an audit are compared to changes in energy use for customers

in a comparison group who did not participate in the program, with both groups being compared against a baseline “pre” period occurring prior to the participants’ receipt of an audit.

The changes in energy use for different groups are determined using the results from regression analysis of the energy usage data for participants and non-participants. ADM used the regression analysis to estimate the amounts of electricity used and to quantify the impacts of receiving an audit on energy consumption after controlling for the effects of weather and other factors. The regression analysis isolates and quantifies the effects of different factors on the changes in energy usage. The technique also lends itself to the analysis of interactions of savings with weather, operating practices, etc.

The basic specification for the regression modeling can be illustrated as follows. Consider modeling the energy use of a customer who received an audit. In simplest terms, average daily electricity use can be separated between weather-sensitive and non-weather-sensitive factors. A model to represent this is:

Equation 15: Base Regression Model

$$AEC_t = \alpha_0 + \alpha_1 HDDperDay_t + \alpha_2 CDDperDay_t + E_{et}$$

Where:

- AEC_t is average daily use of electricity for period t for a customer (determined by dividing total usage over a billing period by number of days in that period);
- HDDperDay is heating degree days per day (determined by dividing total heating degree days usage over a billing period by number of days in that period);
- CDDperDay is cooling degree days per day (determined by dividing total cooling degree days usage over a billing period by number of days in that period);
- E_{et} is an error term;
- α_0 is the intercept term;
- α_1 and α_2 are regression coefficients showing the changes in use that occurs for a change in either heating degree days or cooling degree days.

The working hypothesis for the analysis is that customers receiving an audit will make changes that affect their electricity usage. For the illustrative model above, these changes will affect either the intercept term (α_0) or the responsiveness to changes in weather

conditions (as measured by the coefficients α_1 and α_2). To capture this effect, α_0, α_1, and α_2 can be specified as follows:

Equation 16: Modeling of Customer Interactive Effects in Response to an Audit

$$\alpha_0 = \alpha_{01} + \alpha_{02}POST$$

$$\alpha_1 = \alpha_{11} + \alpha_{12}POST$$

$$\alpha_2 = \alpha_{21} + \alpha_{22}POST$$

Where, POST is a dummy variable that is 0 if the monthly period is before the customer received an audit and 1 if the monthly period is after the customer received the audit. With this formulation, the model for the regression analysis becomes:

Equation 17: Difference-in-Differences Regression Model Specification

$$AEC_t = \alpha_{01} + \alpha_{02}POST + \alpha_{11}HDDperDay_t + \alpha_{12}POST*HDDperDay_t + \alpha_{21}CDDperDay_t + \alpha_{22}POST*CDDperDay_t + E_{et}$$

With the difference-in-differences method, the simple model is expanded to include a sample of non-participants. The implicit assumption for the difference-in-differences analysis is that a change in energy use in response to a change in weather conditions would be the same for the non-participant (comparison) group and the participant (audit) group in the absence of the program. If this assumption holds, then the change in energy usage of the non-participant group in response to a change in weather conditions can be applied to predict what the (counterfactual) energy use of the participant group would have been under the changed weather conditions in the absence of the program. This allows the difference between actual post-audit energy use of the audit group and the counterfactual predicted energy use to be calculated as the savings attributable to the program.

Preparation of Billing and Weather Data

The Companies provided ADM with billing data on monthly electricity use for participants in the OA program who had initiated a home energy audit either online or by telephone during 2013. These data included:

- Monthly kWh consumption billed for each customer for 24 months (January 2012 – December 2013);
- Beginning and end dates for each monthly electric bill, and number of days billed;

The Companies also supplied data for the following variables for each participant.

- Utility customer ID and premise ID;
- Service address zip code;
- Audit method (online or telephone); and
- Dates of completion for each audit level (three possible).

The data were prepared for analysis through the following activities.

- Any customer with a zero, negative or excessively high (>10,000 kWh/Month) kWh entry was removed from the analysis file.
- A customer was also expunged from the analysis file if they had less than 20 or greater than 26 monthly observations.

For the regression analysis, billing data for the 60 days immediately preceding the date of a customer's audit were also excluded to account for any unusual changes in billed energy use that might have prompted a customer to decide to have an audit.

The regression analysis also took account of the possible energy savings associated with the participation of 2013 OA participants in other residential energy conservation programs of the Companies. Estimated impacts of the OA program would likely be biased if the regression were to include participants who also were enrolled in other programs. Lists of participants for other residential programs were used to flag OA participants with dual enrollments. The residential conservation programs and subprograms that were considered in this flagging exercise were the following:

- Easy Cool Rewards Program (rebates for programmable thermostats)
- Appliance Recycling
- Appliance Rebates (part of the Energy Efficient Products Program)
- CFL Retail Program (part of the Energy Efficient Products Program)
- HVAC Tune-ups and Rebates (part of the Energy Efficient Products Program)
- Community Connections (Low-Income) Program
- Comprehensive Home Audits
- Energy Conservation Kits
- Residential New Construction Program
- Behavioral Modification Program

With a flag variable created that identified dual enrollments, the regression models could be run with dual enrollment participants excluded.

This data cleaning process removed participant customers from the analysis data set. The final analysis file was composed of a sample of 6,035 participants who passed all data screening checks. Customers removed from the regression were still accounted for in the final kWh and kW savings calculations, since the data errors detected were simply billing related and had nothing to do with their participation in the program.

Similar data, except for audit method and date, were supplied by the Companies for a random sample of customers who did not participate in the OA program; these customers represented a comparison group. The cleaning procedures applied to the billing data for program participants were also applied to the billing data for the comparison group. This cleaning resulted in a comparison group sample consisting of 12,802 customers.

Estimating Coefficients of Regression Models

The coefficients of the regression models were estimated by applying estimation procedures that took into account both the cross-sectional and the time-series dimensions of the data. In particular, regression models were estimated by pooling cross-sectional observations (i.e., customers) with time-series observations (i.e., monthly consumption).

A "fixed-effects" specification was used for the panel regression modeling. The purpose of this specification is to control for those determinants of a household's electricity use that are constant over time. The basic idea underlying this specification is that each customer household acts as its own control, both for household characteristics that are easily measured (like house size and age) and for characteristics more difficult to measure (like interest in conservation, etc.) Time-varying variables are handled by measuring and putting them as covariates in a "fixed effects" regression model.

Conceptually, a "fixed effects" regression analysis involves applying a least squares dummy variable (LSDV) covariance estimate procedure. In this approach, as described in Allison[50], a binary dummy variable is created for each customer in the sample, with the variable assigned a value of 1 for each observation that is associated with the customer and a value of 0 for each observation that is not. The full set of these dummy variables is included in the regression analysis. In effect, the equation estimated contains a unique constant term for each customer that captures the effects of all the determinants of that customer's electricity use that are constant over time. This approach automatically

[50]Allison, P., 2006. "Fixed Effects Regression Methods in SAS." *SAS Conference Proceedings: SAS Users Group International 31*, Paper 184-31, March.

controls for differences among households that influence the average level of consumption across customer households. The specification of customer-specific effects allows the regression model to capture much of the baseline differences across customers while obtaining reliable estimates of the effects of the audits.

In practice, with a large number of customers participating in the OA program, an analysis where an explicit dummy variable could be created for each household was problematic. The computational requirement in estimating coefficients for all the dummy variables would have been burdensome for the large sample. Accordingly, the estimation was accomplished using a mean deviation method that is described in Allison.This procedure was implemented using Stata, with customer ID being used as a variable for the *absorb* option in the *areg* regression command.[51]

Method for Calculating kWh Savings

Once an appropriate regression model was estimated, the regression results were used in the calculation of per-participant and program-level kWh savings. Estimates of savings were developed for four groups of customers as defined by type and level of audit. The four groups are as follows:

- Telephone audits, Level 1
- Telephone audits, Levels 2 and 3 together
- Online audits, Level 1
- Online audits, Levels 2 and 3 together

Summarized, the steps in the calculation are as follows.

- **For Step 1**, assume the estimated regression model represents “typical” customer behavior. Apply the estimated regression coefficients to “average” heating and cooling degree days to calculate kWh savings. Although the same regression coefficients are used for each operating company, heating and cooling degree day values were used that were specific to each company’s service territory, thus providing separate estimates of savings for each utility for the four audit groups.

[51] The procedure for the mean deviation approach is as follows. For each customer, means over time are first computed for each time-varying variable (both response and predictor variables). The customer-specific means are then subtracted from the observed values of each variable for that customer. The resulting variables are then used in the regression analysis. As noted in the text, this is accomplished in Stata using the *areg* regression command with the absorb option.

- **In Step 2**, determine program-level kWh savings for each audit group for each utility company by multiplying the per-participant kWh savings value for a group by the number of customers who were participants in that group for a utility company.

Method for Calculating kW Reductions

- **In Step 1**, determine the amount of annual per-participant kWh savings that occurs in the critical period months of June, July, and August. This is determined by using the data on monthly kWh savings that are calculated during Step 1 of the kWh savings calculations. Also use that data to allocate kWh savings during the critical peak months between heating-related and cooling-related savings.
- **In Step 2**, using TMY weather data, calculate the percentage of heating degree hours and cooling degree hours during the critical peak months that occur during the critical peak hours for those months (i.e., during the hours from 3 PM to 6 PM on non-holiday weekdays). Use these percentages to determine how much of the heating-related and cooling-related kWh savings calculated in Step 1 occurred during the critical peak hours.
- **In Step 3**, divide the sum of heating-related and cooling-related kWh savings during critical peak hours by the number of critical peak hours to determine the per-participant per-hour kW reduction occurring during critical peak hours.[52]
- **In Step 4**, determine program-level kW reductions for each audit group for each utility company by multiplying the per-participant kW reduction value for a group by the number of customers who were participants in that group for a utility company.

Method for Identifying Persistence Effects through Analysis of Billing Data

An analysis of customer billing data was used to identify whether the effects of the OA program on energy use persisted over time. This analysis addressed persistence of savings for the 2010, 2011 and 2012 cohorts of program participants.

As discussed in **Error! Reference source not found.**, each cohort can be divided into four groups, defined by type and level of audit. Using the regression model specification described in **Error! Reference source not found.** (with average daily electricity use being related to heating and cooling degree day variables), two regression models were estimated for each group in each cohort. One model was estimated using data for the period before an audit was performed, and a second model was estimated using billing and weather data for 2013.

[52] For June, July, and August, there are 65 non-holiday weekdays. With 3 critical peak hours for each of these days, the total number of critical peak hours is 195.

Given the estimated regression models, estimates of weather-normalized annual energy use are developed for each group in each cohort. By using this approach, the effects of weather are controlled in the analysis. The analysis then involves comparing estimated annual energy use in 2013 to energy use in the pre-audit period to determine whether there are reductions in energy use that are correlated with program participation.

To take into account the effects of factors other than program participation, regression models are also estimated for each cohort's comparison group. Because these comparison groups are formed by taking random samples from the non-participant population of residential customers, the estimates of per-customer annual energy use developed for these groups provide a measure of how electricity use changed over time because of factors other than program participation.

Analysis of Billing Data

To analyze the persistence of savings, billing data for the original treatment and control group samples from the evaluation of the 2010, 2011 and 2012 OA programs were updated with 2013 billing data.

The persistence analysis compares energy consumption for the samples of 2010, 2011 and 2012 OA participants with their consumption for the 12 months prior to their audit. The amount of persistence data available depends on the time of year when the audit occurred. The original treatment effect will encompass the 12 months post audit, and the persistence period will include all available data for 13 or more months after the audit.

The final regression specification chosen for the analysis of savings for the 2013 program is also used as the specification for the model used to develop savings estimates for analyzing persistence. Using the regression results, persistence effects were analyzed for those customers who participated in an energy audit in 2010, 2011 or 2012 by comparing their average energy consumption 13+ months post audit to their consumption in the baseline year (i.e., the 12 months prior to their energy audit).

Survey Data Collection for Persistence Analysis

Additional data with which to analyze the persistence of savings from customers who participated in the OA Program in 2010, 2011 and 2012 were collected through surveys of samples of customers from several groups of the Companies' residential customers in Ohio. These groups were as follows:

- Online audit participants in the OA program in 2010, 2011 and 2012
- Telephone audit participants in the OA program in 2010, 2011 and 2012

Survey Data Collection Procedures

The sampling plan for the survey of these customers is shown in Table 4-5.

Table 4-5: Sampling Plan for Persistence Survey

	2010 OA Participants		***2011 OA Participants***		***2012 OA Participants***	
	Telephone Audits	***Online Audits***	***Telephone Audits***	***Online Audits***	***Telephone Audits***	***Online Audits***
Sample sizes	n = 70	n = 70	n = 70	n = 70	n = 70	n = 70

The persistence surveys with 2010, 2011 and 2012 participants in the OA program was conducted online using SurveyGizmo. The survey was directed at obtaining information with which to determine the extent to which any energy saving actions (either structural or behavioral changes) that were taken by these groups in 2010, 2011 and 2012 were still in place or were continuing to be practiced by these customers in 2013. Interview questions included the following:

- For structural changes: How is that working out? Is it still installed?
- For behavioral changes: Are you still continuing to do that or are you doing something else now? Have you made any other energy saving changes?

Analysis of Survey Data to Determine Persistence Effects

The survey data were analyzed using descriptive statistics and cross tabulations. Responses to open-end questions were content analyzed and coded using a set of structured response categories. The data for online and telephone audit savers were analyzed to determine whether the behavioral and structural changes they reported in 2010, 2011 or 2012 had persisted through 2013. For online audit savers, persistence rates for behavioral and structural changes were compared by audit level.

Process Evaluation Methodology

The process evaluation of the 2013 OA program was based on data collected through surveys of samples of customers from three groups of residential customers in Ohio. These groups were as follows:

- 2013 online audit participants
- 2013 telephone audit participants
- 2013 comparison group customers

Collection of Data for 2013 Online Audit Participants

Data were collected from two random samples of 2013 online audit participants. One sample included participants who conducted an online audit at level 1, while the other sample included participants who conducted an online audit at levels 2 or 3. The sample sizes for each audit method meet the requirement for ±10 percent precision at the 90 percent confidence level for the utilities combined. The sampling plan for allocating the sample to the individual utilities is shown in Table 4-6.

Table 4-6: Sampling Plan for Survey of 2013 OA Online Audit Participants

Utility Company	Sampling Proportion	Level 1 Audit	Level 2/3 Audit	Sample Size (Completes)
OE	0.60	n = 42	n = 42	n = 84
CEI	0.26	n = 18	n = 18	n = 36
TE	0.14	n = 10	n = 10	n = 20
Total	1.00	n = 70	n = 70	n = 140

Data for the samples of online audit participants were collected through an online survey using SurveyGizmo. Participants provided information with which to determine customers' reasons for seeking only a Level 1 audit or for going beyond a Level 1 audit to a Level 2 or Level 3 audit. For each level of audit, the survey questionnaire was structured to include questions with which to determine the kind of information customers received and to assess how well the information met their needs. Customers were also asked about actions, if any, they took after completing the audit. Actions taken were characterized as either structural (i.e., primarily equipment upgrades) or behavioral.

Examples of questions included the following:

- Why did you conduct an online energy audit? What were your concerns?
- What information did you get from the online energy audit?
- How well did this information meet your needs? How or why? Or why not?
- What were you able to do with this information? What actions did you take as a result of the online audit, if any, to conserve energy in your home?

A copy of the survey administered to the 2013 online audit group is provided in Appendix B.

After the survey was completed, responses to open-end questions were coded according to structured response categories.

Collection of Data for 2013 Telephone Audit Participants

Data was collected from a random sample of 2013 OA participants who received telephone audits. The sample size was calculated to meet the requirement for ±10 percent precision at the 90 percent confidence level for the utilities combined. The total sample was allocated to the individual utilities in the proportions shown in Table 4-7.

Table 4-7: Sampling Plan for Survey of Telephone Audit Participants

Utility Company	***Sampling Proportion***	***Sample Size (Completes)***
CEI	0.26	n = 18
OE	0.60	n = 42
TE	0.14	n = 10
Total	1.00	n = 70

Data for the sample of telephone audit participants were collected through an online survey using SurveyGizmo. Participants were asked questions with which to determine the kind of information that was provided by Contact Center Representatives to help address customer concerns about high energy bills. Customers were also asked questions about the usefulness of this information to them and the actions customers took in response to the information provided.

Examples of interview questions for telephone audit participants included the following:

- Why did you call the contact center? What were your concerns?
- What did the customer service representative discuss with you?
- Did you receive any information by mail or email as a follow-up?
- How helpful was the information provided?
- What were you able to do with this information? What actions did you take as a result of the telephone audit, if any, to conserve energy in your home?

A copy of the survey that was administered to telephone audit participants is provided in Appendix B.

Collection of Data from Comparison Group of Non-Participants

Data was collected from a random sample of residential customers who had not participated in the OA program in 2010, 2011, 2012 or 2013. The total sample size was calculated to meet the requirement for ±10 percent precision at the 90 percent confidence

level across the three service territories combined. The total sample was allocated to the individual utilities at the proportions shown in Table 4-8.

Table 4-8: Sampling Plan for Survey of Non-Participants

Utility Company	Sampling Proportion	Control Sample
CEI	0.26	n = 36
OE	0.60	n = 84
TE	0.14	n = 20
Total	1.00	n = 140

The survey of non-participants was conducted by telephone by Research America. The telephone interviews were used to collect information with which to determine the actions that non-participant customers took in 2013 to save energy. Actions taken were characterized either as structural (i.e., primarily equipment upgrades) or behavioral. The non-participants surveyed were explicitly asked whether they had participated in other energy conservation programs offered by the Companies.

A copy of the survey that was administered to non-participants is provided in Appendix B.

Analysis of Survey Data for 2013 Participants and Non-Participants

The survey data were analyzed using descriptive statistics and cross tabulations. The data for online and telephone audit participants and nonparticipants were analyzed to determine whether they had made behavioral or structural changes as a result of the audit and whether they were doing things differently now to save energy in hot and cold weather. For online audit participants, data comparisons were made by audit level (i.e., Level 1 vs. Levels 2/3).

4.2 Evaluation Methodology: Energy Conservation Kits

4.2.1 Impact Evaluation Methodology

The impact evaluation strategy was identical for direct mail kits and schools kits. Two major activities were performed in the audit analysis of the Energy Conservation Kits subprogram:

- Ex ante review of program data
- Performing impact analysis calculations using the TRM algorithms

Ex Ante Review

ADM reviewed and audited all of the Energy Conservation Kits data and found the data to be adequate for impact evaluation. The ex ante estimates of kWh savings and kW reduction for the Direct Mail Kits and the Schools Kits are shown in Table 4-9 and Table 4-10.

Table 4-9: Ex Ante Estimates of per Unit Annual kWh Savings and kW Reduction for Direct Mail Kits

Measures	Measures Per Kit	kWh	kw	Source
13W CFLs	4	161.6	0.019	Ohio TRM
20W CFLs	2	93.8	0.011	Ohio TRM[53]
26W CFLs	3	153.9	0.018	Ohio TRM
LED Night Lights	2	13.2	0	Pennsylvania TRM
Furnace Whistle	1	70.8	0	Pennsylvania TRM
7 Plug Smart Strip	1	37.4	0.004	Ohio TRM
Faucet Aerator*	2	6.8	0.001	Ohio TRM
Showerhead*	1	46.1	0.004	Ohio TRM

**This measure only contained in the all-electric kits*

Table 4-10: Ex Ante Estimates of per Unit Annual kWh Savings and kW Reduction for Schools Kits

Measures	Measures Per Kit	kWh	kw	Source
13W CFLs	3	121.2	0.015	Ohio TRM
18W CFLs	1	42.2	0.005	Ohio TRM
LED Night Lights	2	6.6	0	Pennsylvania TRM
Faucet Aerator	2	6.8	0.001	Ohio TRM

Customer Survey

A customer survey was conducted to verify measure in-service rates.[54] Verification was completed for each of the measures on record. Customers with email addresses were administered an online survey and a random selection of customers who did not provide emails were administered a phone survey.

[53] Ohio TRM algorithm modified by ADM shelving study shown in appendix C

[54] See appendix C for survey instruments.

Impact Analysis Methods

For each Opt-In Kit measure installed in 2013, total energy (kWh) savings and total peak demand (kW) reduction for that measure were determined as a product of the number of measures verified as being installed and the savings estimated per measure. ADM used the algorithms specified in the TRM or as revised based on recommendations contained in the Ohio TRM Joint Utility Comments and approved by the Vermont Energy Investment Corporation to verify the energy and demand savings claims for the Energy Conservation Kits subprogram. In the case of furnace whistles and LED nightlights, the TRM does not specify an algorithm; the savings for these measures were calculated according to industry best practices. The calculations for the following measures are reviewed in previous sections of this plan:

- CFLs
- Kitchen and bathroom faucet aerators
- Low flow showerheads

The calculations for measures not previously specified are presented here.

Furnace Whistles

The TRM does not specify an algorithm for furnace whistles, so energy savings were calculated using the Pennsylvania TRM algorithm as follows:

Equation 18: Furnace Whistle Calculation of Energy Savings

$$\Delta kWh = MkW \times EFLH \times EI \times ISR$$

Where:

MkW	= Average motor full load electric demand (kW)
	= 0.5 kW
EFLH	= Estimated Full Load Hours (Heating and Cooling)[55]
	=Will be taken from Ohio TRM
EI	= Efficiency Improvement
	=15%
ISR	= In-service Rate[56]

[55] This is a location dependent variable which depends on customer's location (defined by zip code) and corresponding EFLH value in look-up table.

[56] This rate was captured by ADM through participant surveys.

According to the PA TRM, there are no measureable peak demand savings attributed to furnace whistles.

LED Nightlights

The TRM does not specify an algorithm for LED night lights, so energy savings were calculated using the Pennsylvania TRM (PA TRM) algorithm as follows:

Equation 19: LED Nightlights Calculation of Energy Savings

$$\Delta kWh = ((Watts_{base} - Watts_{NL}) \times (NL_{hours} \times 365))/1000) \times ISR$$

Where:

Wattsbase = Wattage of baseline nightlight

WattsNL = Wattage of LED nightlight

NLhours = Average hours of use per day per Nightlight

ISR = In-service rate

According to the PA TRM, there are no measureable peak demand savings attributed to LED night lights.

Seven Plug Smart Power Strips

The energy savings for seven plug smart power strips are deemed in the TRM as 102.8 kWh per year.[57]

Equation 20: Smart Power Strip Calculation of Summer Coincident Demand Savings

$$\Delta kW = kWh/Hours*CF$$

Where:

Hours = Annual number of hours during which the controlled standby loads are turned off by the Smart Power Strip.

CF = Summer Peak Coincidence Factor for measure

=0.8

[57] Deemed value for seven plug smart power strips based on NYSERDA measure characterization for advanced power strips.

4.2.2 Process Evaluation Methodology

Direct Mail Kits

The process evaluation focuses on the effectiveness of program policies and organization, as well as the program delivery framework. As 2013 marked the first year of operation for the Energy Conservation Kit Program, the current process evaluation seeks to illustrate and assess core program features, resources, and objectives.

The process evaluation findings are based upon analysis of program structure and interviews and surveys of participating customers, the Companies' program staff, and program tracking data. Additionally, the process evaluation includes a documentation review of program literature such as marketing materials and program planning documents.

Evaluation Objectives

The purpose of the process evaluation is to examine program operations and results for the operating year, and to identify potential program improvements that may prospectively increase program efficiency or effectiveness in terms of customer participation and satisfaction levels. This process evaluation was designed to document the operations and delivery of the Energy Conservation Kit Program during 2013.

Key research questions that were addressed by this evaluation of 2013 activity include:

- How do participants learn about the program?
- Why did customers participate in the program?
- How satisfied are participants with the program?
- What are participant attitudes towards individual measures? Are some measure types favored over others?
- Are there any current plans for changes to program structure or design, and what opportunities may exist for future modifications to these factors?

During the evaluation, data and information from multiple sources were analyzed to achieve the stated research objectives. Insight into the customer experience with the Energy Conservation Kit Program is developed from an online and telephone survey of program participants. The internal organization and operational perspective on the program is examined through the program staff interview.

Summary Data Collection

In the 2013 program year evaluation, ADM reviewed relevant program documents, promotional literature, and other materials to gain an understanding of program objectives

and design features. Specifically, this provided insight into kit distribution goals, conservation kit contents, marketing messages, and program educational materials.

Participant surveys were the primary data source for providing insight into the customer perspective on the program. The participant surveys provided feedback and insight regarding customer experiences with the Energy Conservation Kit Program. Respondents reported on their satisfaction with the program, the usefulness of the measures and educational materials, and whether they installed the measures provided in the kit. Installation rates obtained through the participant survey effort were used to inform the savings impact analysis.

An interview with the program manager provided insight into program operation and implementation. Specifically, program management staff discussed key program objectives, design considerations, and overall program performance thus far. Staff also provided information regarding future plans for the program such as kit modifications and marketing strategies.

Schools Kits

The process evaluation focuses on the effectiveness of program policies and organization, as well as the program delivery framework. As 2013 marked the pilot year for the Student Kit Program, the current process evaluation seeks to illustrate and assess core program features, resources, and objectives.

The process evaluation findings are based upon analysis of program structure and interviews and surveys of participating customers, program staff, and program tracking data. Additionally, the process evaluation includes a documentation review of program literature such as marketing materials and program planning documents.

Evaluation Objectives

The purpose of the process evaluation is to examine program operations and results for the operating year, and to identify potential program improvements that may prospectively increase program efficiency or effectiveness in terms of customer participation and satisfaction levels. This process evaluation was designed to document the operations and delivery of the Student Kit Program during 2013.

Key research questions that were addressed by this evaluation of 2013 activity include:

- How did participants learn about the program?
- Why did customers participate in the program?
- How satisfied were participants with the program?

- What were participant attitudes towards individual measures? Are some measure types favored over others?
- Are there any current plans for changes to program structure or design, and what opportunities may exist for future modifications to these factors?

During the evaluation, data and information from multiple sources were analyzed to achieve the stated research objectives. Insight into the customer experience with the Student Kit Program was developed from an online and telephone survey of program participants. The internal organization and operational perspective on the program is examined through the program staff interview.

4.3 Evaluation Methodology: New Homes

4.3.1 Impact Evaluation Methodology

The M&V approach for 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 2013 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?

Data Collection and Verification of Program Population

The first aspect of conducting measurements of program activity was to verify the number of homes 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.

Engineering Review

ADM used various sources for the engineering review of the 2013 Residential New Construction program. There were five types of data collected for evaluation of the 2013 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. QA/QC data included more detailed information, like duct testing values and infiltration, as well as insulation values. ADM's field visit verification data generally included; building orientation, insulation values, window u-values and SHGC, HVAC equipment model numbers, domestic water heater information, and lighting fixture and type counts. The review process used a combination of all available data sources for a particular site to assess the reasonability of the model's inputs and outputs.

For homes that were selected to be included in the M&V sample, ADM first 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). All *ex post* savings were calculated using either version 14.3 or 14.4.1 of REM/Rate, depending on the version used to produce *ex ante* savings. All provided models that used version 14.3 or earlier were evaluated for *ex post* savings using version 14.3. Typically, when an older version of the modeling software (REM/Rate version 13.0 or earlier) was used to produce *ex ante* savings, there was a small discrepancy between the *ex ante* savings estimates. This difference is due to upgrades and improvements made to the REM/Rate software package.

If available, 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 using satellite mapping techniques and/or on-site verification. [58] Finally, ADM verified the builder provided lighting and appliances by interviewing home builders and home owners over the phone.

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

On-Site Data Collection Procedures

ADM staff conducted on-site visits to verify home builders' construction practices and plan types. 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

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, if it is occupied or not, and the home's actual cardinal orientation. While on-site, ADM also verified heating fuel type and outside unit air conditioner/heat pump efficiency. 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.

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.

4.3.2 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 2013 with the development of surveys and sampling frames and to field the telephone surveys beginning in January, 2014. Table 4-11 summarizes the focus of the four impact evaluation research questions along with their associated methods of data collection and analysis.

Table 4-11: 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

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.

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:

- Companies 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

Participant Survey

For the participant survey, ADM and Research America completed 62 surveys with owners of homes incentivized through the program in February to April 2014. Of the 62 respondents, 30 were from Ohio Edison, 30 were from Cleveland Electric, and 2 were in the Toledo Edison service territory. The survey asked homebuyers about their decision-making, the influence of the realtor and builder, appliance characteristics, and satisfaction levels with the equipment.

4.4 Evaluation Methodology: Behavioral

The five impact questions addressed in the 2013 evaluation were:

- To what extent has the 2013 Behavioral Modification program resulted in electric energy savings for participating customers (compared to similar non-participating customers) in each of the three Ohio utilities, as measured by annualized reductions in kilowatt hours (kWh) per customer?
- How did kWh savings vary depending on season and selected housing characteristics?
- What kinds of energy efficiency changes (behavioral or structural) made by customers were responsible for producing the observed energy savings?
- What percentage of home energy efficiency changes made by Home Electricity Report recipients were behavioral versus structural?

4.4.1 Impact Evaluation Methodology

Analysis of the impact of the Behavioral Modification program on energy savings was conducted using regression analysis of billing data. The main objectives of the analysis were to quantify the impact of program participation on energy consumption, after controlling for the effects of weather and other factors.

To determine the savings resulting from the 2013 BMod program, a "difference in differences" method was used for the analysis. With this method, changes in energy use for customers receiving HERs are compared to changes in energy use for customers in a comparison group who did not participate in the program, with both groups being compared against a baseline "pre" period occurring prior to the participants' receipt of their first energy usage report.

This quasi-experiment utilizes a randomized control trial. The Companies targeted high energy users[59] as the target population for the Behavioral Modification program. After the initial target population was selected, OPower randomly allocated (in a manner that is not related to usage patterns, geography, house size, etc.) each household into either the treatment (household receives HER) or the control group (household receives no communication from OPower). This method creates two groups that are statistically equivalent, except for one group's receipt of HERs. ADM confirmed that the treatment and control groups had equivalent distributions with respect to average pre-HER usage and the date when the first HER was received (i.e. parity with respect to the number of pre-HER and post-HER months per account).

The changes in energy use for different groups were determined using the results from regression analysis of the energy usage data for the treatment and control groups. ADM used regression analysis to estimate the amounts of electricity used and to quantify the impacts of receiving an energy usage report on energy consumption after controlling for the effects of weather and other factors. The regression analysis isolated and quantified the effects of different factors on the changes in energy usage.

Because of the large size of the dataset, the idiosyncrasies of electricity usage among households, and the limited number of independent variables available (mainly weather-related variables), inference on the effect of HERs is noisy, but robust, given the large size of the sample. Because this principle holds regardless of model complexity, a parsimonious (i.e. using a minimal number of variables) model was selected to estimate the effect of HERs on the treatment group. The following linear model was fitted on the data:

Equation 21: Behavioral Management Base Regression Model

$$kWh_{i,t} = a_1 \cdot CCD_{i,t} + a_2 \cdot HDD_{i,t} + a_3 \cdot post_{i,t} + a_4 \cdot treat_i + a_5 \cdot treat_i \times post_{i,t} + \epsilon_{i,t}.$$

[59] It is important to note that the targeting of high-use customers in the treatment and control groups in this program will perforce produce savings estimates that apply only to similarly high-use customers. The savings of lower-usage customers will not be seen in the same proportion as exists in the full customer population.

Where, i indexes individual accounts, and $t = 1, \ldots, T(i)$ is a time index, denoting the distinct bills originating from that account. The terms in the model are

- $kWH_{i,t}$, which is the total consumption (billing_usage) divided by the number of days in the billing period (billing_duration), to normalize the bills to the average daily usage during the billing period.
- $CDD_{i,t}$ and $HDD_{i,t}$, which is the average number of cooling degree days (base 70) and heating degree days (base 55), respectively, during the billing period, as measured at a local weather station (KAKR for OE, KCLE for CEI, and KTUL for TE).
- $post_{i,t}$, which is an indicator variable, equal to 1 when the bill is received after the date listed in first_generated_date, and 0 otherwise (this field is also defined for accounts in the control group, and signifies when their treatment group counterparts begin receiving HERs). The value of a_3 is an estimate of the average change in usage (for both treatment and control groups) between the pre-HER and post-HER periods. This change is assumed to be independent of the effect of the HERs themselves.
- $treat_i$, which is an indicator variable, equal to 1 if an account's recipient_status field is equal to "RECIPIENT," and equal to 0 otherwise. The value of a_4 is an estimate of the average difference in usage between the treatment and control groups, when the bills are taken as a whole. For all of the models fitted, this coefficient is not significant at 5% confidence, serving as an additional confirmation of the randomization into treatment and controls.
- The interaction term $treat_i \times post_{i,t}$, is an indicator, which equal to 1 when a bills originates from a treatment account during the post-HER period, and 0 otherwise. Its coefficient a_5 is an estimate in daily energy usage among the treatment group during the post period, after controlling for the same pre-post change in the control group, and the systematic differences between treatment and control groups.

It should be noted, that the main quantity of interest, a_5, is an average over the entire treatment group and does not distinguish between differences in, for example, date at which the first HER was generated. While it does not stratify the savings estimated among all possible groupings of the treatment group, the value of a_5 is general, so it can be uniformly applied to all participants.

Estimating Coefficients of the Regression Models

The coefficients of the regression models were estimated by applying estimation procedures that take into account both the cross-sectional and the time-series dimensions of the data. In particular, regression models were estimated by pooling cross-sectional observations (i.e., customers) with time-series observations (i.e., daily consumption).

As a first pass, the linear model was fit using pooled ordinary least squares (using the "lm" command in the R language's base library[60]), which does not take into account heterogeneity due to individual households. This is done as a "reasonableness check" to see whether the model coefficients are within an expected range.

As a second pass, to achieve a better fit with the data, a "mixed-effects" specification was used for the panel regression modeling. The purpose of this specification is to control for those determinants of a household's electricity use that are constant over time. The model specification is identical to that used for the OLS model, except that the error term is decomposed as:

Equation 22: Error Term Decomposition

$$\epsilon_{i,t} = u_i + v_{i,t}.$$

That is, the noise in the data is assumed to be accounted for by random differences (u_i) from the average usage among different accounts, and irreducible noise ($v_{i,t}$), which is due to the limitations of the model. Accounting for this noise structure in the data allows one to get better and less-biased inferences on the value of the model coefficients, as well as their uncertainties.

Standard statistical tests and regression diagnostics were used to evaluate the performance of the models. Each model is screened for implausible results. The statistical tests and diagnostics include evaluating the t-statistics for estimated coefficients and the R^2 for equation fit and examining residuals from the fitted models. The results of the statistical testing and diagnostic screening are used to select the model that explains the data best. The goodness-of-fit for the mixed effects models are given by two different numbers. The larger is the conditional R^2, which is the amount of variation explained by the model variables and the random intercepts. The marginal R^2 is the

[60] R Core Team (2013). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL http://www.R-project.org/.

smaller number that gives the amount of variation explained by the model variables alone and is more analogous to the r-squared value for the pooled OLS.

Methods for Calculating Program Level Savings

Once an appropriate regression model is estimated, the regression results were used in the calculation of per-participant and program-level kWh savings and kW savings.

Method for Calculating Program kWh Savings

As mentioned above, the estimate of the "Post x Treat" coefficient gives the average change in daily energy consumption from pre-HER to post-HER. For the first "Wave" of customers receiving HERs, the post period in 2013 extends from, at the earliest, August 2013 up to December 2013, meaning customers in the treatment group had received HERs for less than a full calendar year. However, to arrive at an estimate of energy savings on an annual basis (365 days a year), the value of "Post x Treat" is multiplied by 365. It should be noted that this may over- or under-estimate real full-year savings due to HERs if there is a "maturation effect" whereby savings increase (or decrease) the longer customers receive HERs. The assumption that is made in extrapolating to annual savings is that there is no maturation effect, which may or may not be valid, but cannot be determined either way until more data is available.

Method for Calculating kW Reduction

For the estimation of demand impacts, it is assumed that the demand reductions achieved with HERs have a flat hourly profile (i.e. the same for all hours). Under this assumption, the demand reductions are derived from the daily energy savings estimates by dividing by 24 (which is equivalent to dividing the annual energy savings by 8760).

Dual Enrollment Effect

To control for energy savings associated with participation in other FirstEnergy residential energy conservation programs or subprograms, ADM obtained lists of program participants for the following programs and subprograms and conduct a data merge on the customer account field to flag participants with dual enrollments. The residential conservation programs that could produce energy savings for customers (as opposed to the utility company) are as follows:

- Easy Cool Rewards Program (rebates for programmable thermostats)
- Appliance Recycling

- Appliance Rebates (part of the Energy Efficient Products Program)
- CFL Retail Program (part of the Energy Efficient Products Program)
- HVAC Tune-ups and Rebates (part of the Energy Efficient Products Program)
- Community Connections (Low-Income) Program
- Comprehensive Home Audits
- Energy Conservation Kits
- Residential New Construction
- Behavioral Modification

A flag variable was created that identified dual enrollments.

Data Elements for Billing Analysis

The following data elements were provided by OPOWER and the Companies for customers randomly selected into the treatment and control group samples.

- Utility customer ID (Account Number)
- Customer Name
- Service Address Zip Code
- Meter Type
- Beginning and end dates of monthly electric bills, and number of days billed.
- For the 2013 analysis: Monthly kWh consumption billed for each customer for 24 months: January 2012 – December 2013
- Billing Period Usage
- Dates of receipt of energy HERs for each customer
- Treatment and control group home characteristic data

Data for the 2013 treatment group members was provided for the 12 months prior to the first recorded energy usage report receipt date and then for all subsequent months up to the latest available date (e.g., through December 2013). Data for the 2013 control group members was also provided for the 24 month span covering 2012 and 2013. Table 4-12 summarizes the focus of the impact evaluation questions along with their associated methods of data collection and analysis.

The billing data for each operating company were screened for the following data points:

- Bills recording fewer than 7 days of usage, and more than 37 days were dropped.

- Bills recording fewer than 250 kWh of usage, and more than 7000 kWh of usage were dropped.
- Accounts that received no HERs (as indicated by a blank "first_generated_date" field) were dropped.

Together, these criteria excluded around 3% of the data points.

Table 4-12: Summary of Impact Evaluation Questions and Methods

Evaluation Question	Data Collection Method	Data Analysis Method
Is there a BMod Program effect?	24 months of billing records	Linear Multiple Regression
How do savings vary by weather and home characteristics?	Program tracking data and certified weather data	Linear Multiple Regression
What kinds of changes are made by participants?	Online/Telephone surveys	Qualitative Analysis
Behavioral vs. Structural changes?	Online/Telephone surveys	Qualitative Analysis

Sampling Plan

ADM received a near census of data for the 2013 BMod impact evaluation.

4.4.2 Process Evaluation Methodology

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

- Did customers remember receiving the Home Electricity Reports, and if so, had they done anything to save electricity in the home in response to the information in the report?
- If customer did not do anything in response to the HER, why not?
- How satisfied are customers with the Behavioral Modification program?

Approach to Evaluating Home Electricity Reports

ADM selected a random sample of over 70 customers[61] (stratified across the three EDCs) who received HERs in 2013. Through online and telephone surveys, we determined whether or not the customer remembers receiving the HERs. We also determined the usefulness of this information to the participants and the actions customers took in response to the information provided. Actions taken were identified as structural (i.e., primarily equipment upgrades) or behavioral.

The sampling plan for conducting online/telephone surveys with customers receiving HERs is shown in Table 4-13. The sample met 90/10 requirements for confidence and precision and was stratified by utility.

Table 4-13: Online/Telephone Survey
Sampling Plan for Customers receiving HERs

Operating Company	Sampling Proportion	Sample Size (Completes)
OE	0.53	N=37
CEI	0.34	N=24
TE	0.13	N=9
Total	1.00	N=70

Process Survey Analysis

A total of 81 completed surveys were conducted by online surveys via SurveyGizmo or telephone surveys conducted by Research America.[62] Interview questions included the following:

- Have you done anything in the past year or so in response to the personalized action steps or tips, or other information contained in the Home Energy Reports?
- How well did you understand the information provided?
- How well did this information meet your needs? How or why?
- What were you able to do with this information? What actions did you take as a result of the telephone audit, if any, to conserve energy in your home? Have you noticed any savings on your electric bill as a result of these actions?

[61] A sample size of 70 meets Ohio sampling standards for achieving 90% confidence with at least 10% precision.

[62] Survey instrument found in Appendix E

5. Detailed Evaluation Findings

This chapter provides the findings of the impact evaluation component of this report.

5.1 Detailed Evaluation Findings: Audits

5.1.1 Verification of Comprehensive Home Audit Program Population

Table 5-1 shows the quantities of qualified energy efficient measures that were rebated per operating company and for the total CHA Program in 2013.

Table 5-1: Quantities of Qualified Measures Installed through CHA Program in 2013 by Operating Company and Type of Measure

Operating Company	***CEI***	***OE***	***TE***	***Total***
Direct Install Measures				
12/22/33 Watt 3-way CFL	331	297	95	723
13 Watt CFL (60 watt)	2,497	2,606	887	5,990
14W Globe CFL	623	891	286	1,800
20 Watt CFL (75 watt)	1,305	1,378	537	3,220
25 Watt CFL (100 watt)	990	1,223	433	2,646
7W Candelabra CFL	186	240	51	477
9W Candelabra CFL	129	103	17	249
Bath Aerators	31	35	5	71
Kitchen Aerators	14	20	4	38
EHW Pipe Insulation	26	38	4	68
Low Flow Showerheads	24	35	4	63
Total Quantity of Direct Install Measures	**6,156**	**6,866**	**2,323**	**15,345**
Rebate Measures				
Attic Insulation	31	300	205	536
Wall Insulation	21	267	144	432
Duct Sealing	3	3	4	10
ENERGY STAR Windows	6,993	5,663	1,274	13,930
Total Quantity of Rebate Measures	**7,048**	**6,233**	**1,627**	**14,908**
Grand Total for Quantity of Measures	**13,204**	**13,099**	**3,950**	**30,253**

5.1.2 Comprehensive Home Audit Gross Annual kWh Savings

Table 5-2 shows estimates of annual kWh savings by measure, operating company, and for the CHA Program in 2013. The program-level estimates of energy savings reported in Table 5-2 and the peak demand reductions reported in Table 5-3 were developed by applying the methods described in Chapter 4. On a measure-by-measure basis, savings per unit developed from applying TRM values or algorithms were multiplied by the quantities in Table 5-1 to develop the per-measure savings estimates that were aggregated to give program-level savings, overall and by operating company. The results reported in the tables show the following.

- Total kWh savings for the CHA program in 2013 were 1,006,179 kWh. Total kW demand reductions were 251.99 kW.
  - Among the three service territories, CEI accounted for 40 percent of total kWh savings, OE for 45 percent, and TE for 15 percent.
  - Of the total kWh savings, 63 percent resulted from direct install measures and 37 percent from rebate measures. Direct install measures accounted for 30 percent of kW demand reductions and rebate measures for 70 percent.
  - Taken together, the various types of CFLs directly installed through the program accounted for 61 percent of the total kWh savings, ENERGY STAR windows for 30 percent, and all other measures for the remaining 9 percent.
  - The verified kWh savings resulted in a program level realization rate of 81%. The direct install measures had a realization rate of 94%, and rebated measures had a realization rate of 64%.

Table 5-2: Ex Post Annual kWh Savings by Measure and Operating Company

Operating Company	***CEI***	***OE***	***TE***	***Total***
Direct Install Measures				
12/22/33 Watt 3-way CFL	20,817	18,883	5,929	45,629
13 Watt CFL (60 watt)	93,531	98,101	33,208	224,841
14W Globe CFL	23,040	33,818	10,892	67,749
20 Watt CFL (75 watt)	56,887	59,846	23,718	140,451
25 Watt CFL (100 watt)	45,028	55,426	18,847	119,301
7W Candelabra CFL	3,404	4,921	1,046	9,371
9W Candelabra CFL	3,401	2,716	448	6,565
Bath Aerators	1,642	1,853	265	3,760
Kitchen Aerators	432	618	124	1,174
EHW Pipe Insulation	3,657	5,095	550	9,302
Low Flow Showerheads	4,376	6,381	729	11,486
Total kWh Savings - Direct Install	**256,215**	**287,658**	**95,755**	**639,628**
Rebate Measures				
Attic Insulation	3,984	13,942	5,531	23,457
Wall Insulation	868	23,737	18,064	42,670
Duct Sealing	-	126	266	392
ENERGY STAR Windows	143,715	126,974	29,343	300,032
Total kWh Savings - Rebate Measures	**148,567**	**164,779**	**53,204**	**366,551**
Grand Total kWh Savings	**404,782**	**452,438**	**148,960**	**1,006,179**

5.1.3 Comprehensive Home Audit Gross Peak Demand (kW) Reduction

The verified kWh savings resulted in a program level realization rate of 86%. The direct install measures had a realization rate of 94%, and rebated measures had a realization rate of 83%. Estimates of annual kW reductions by measure, operating company for the 2013 CHA subprogram are shown in Table 5-3.

Table 5-3: Ex Post Annual kW Savings by Measure and Operating Company

Operating Company	***CEI***	***OE***	***TE***	***Total***
Direct Install Measures				
12/22/33 Watt 3-way CFL	2.49	2.26	0.71	5.46
13 Watt CFL (60 watt)	11.19	11.73	3.97	26.89
14W Globe CFL	2.76	4.04	1.30	8.10
20 Watt CFL (75 watt)	6.80	7.16	2.84	16.80
25 Watt CFL (100 watt)	5.39	6.63	2.25	14.27
7W Candelabra CFL	0.41	0.59	0.13	1.12
9W Candelabra CFL	0.41	0.32	0.05	0.79
Bath Aerators	0.21	0.24	0.03	0.48
Kitchen Aerators	0.06	0.08	0.02	0.15
EHW Pipe Insulation	0.42	0.58	0.06	1.06
Low Flow Showerheads	0.56	0.82	0.09	1.47
Total kW Savings - Direct Install	**30.68**	**34.45**	**11.46**	**76.59**
Rebate Measures				
Attic Insulation	0.91	12.88	5.74	19.53
Wall Insulation	1.10	17.97	8.09	27.16
Duct Sealing	-	0.07	0.14	0.20
ENERGY STAR Windows	64.15	52.36	11.99	128.50
Total kW Savings - Rebate Measures	**66.17**	**83.28**	**25.95**	**175.40**
Grand Total kW Savings	**96.85**	**117.73**	**37.41**	**251.99**

5.1.4 Results of Regression Analysis for Online Audits

The results of the regression analysis (estimated coefficients and their corresponding standard errors) for the models used for determining kWh savings are reported in Table 5-4. Definitions for the variables in the model are provided in Table 5-5.

Table 5-4: Results of Regression Analysis of Billing Data
for Models Used to Estimate kWh Savings for Participants in the 2013 OA Program

Variable	*Comparison Group*	*Telephone Level 1*	*Telephone Levels 2/3*	*Online Level 1*	*Online Levels 2/3*
Constant	18.46***	23.98	23.96***	24.41***	24.63***
Heating degree-days (HDD) per day for billing period	0.33*** (0.00)	0.85 (0.11)	0.63*** (0.01)	0.48*** (0.01)	0.56*** (0.01)
Cooling degree-days (CDD) per day for billing period	2.43*** (0.02)	3.27 (0.54)	2.61*** (0.06)	2.98*** (0.05)	3.14*** (0.07)
Post	6.94*** (0.13)	8.62 (4.15)	6.05*** (0.52)	7.36*** (0.40)	7.97*** (0.59)
Post * HDD per day for billing period	-0.34*** (0.01)	-0.44 (0.16)	-0.33*** (0.02)	-0.35*** (0.01)	-0.40*** (0.02)
Post * CDD per day for billing period	-1.69*** (0.03)	-2.06 (0.95)	-2.18*** (0.12)	-2.23*** (0.09)	-2.42*** (0.14)
Mean of dependent variable	27.67	42.81	37.67	36.73	38.29
Number of customers	12802	32	1944	2779	1280
R-squared	0.08	0.11	0.08	0.08	0.09

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0

Table 5-5: Definitions for Variables in Regression Models

Variable Name	***Variable Definition***	***Measurement Scale***
kWh per day	Average daily kWh for customer during billing period	Continuous variable
Customer ID	Customer contract account number	Continuous variable
Cooling degree-days per day	Cooling degree days, referenced to base temperature of 68°F during billing period	Continuous variable
Heating degree-days per day	Heating degree days, referenced to base temperature of 67°F during billing period	Continuous variable
Post	Post Audit indicator variable (0 = pre-audit; 1 = post-audit	Binary variable

5.1.5 kWh Savings and kW Reductions for Participants in the 2013 Online Audit Program

The results from the regressions reported in Table 5-4 were used to determine annual kWh savings and kW reductions per participant for the 2013 OA program. All coefficients of interest that were significant at the 90% confidence level were used for this purpose.

The regression results reported in Table 5-4 were used to determine weather-normalized differences in pre- and post-audit annual kWh for customers in the 2013 OA program and in the comparison group. These weather-normalized values for differences in pre- and post-audit annual kWh are presented in Table 5-6 by utility and type and level of audit. Customers receiving only a Level 1 audit by telephone had no change in annual usage. There were reductions in annual energy use for customers who received a Level 1 audit online or Level 2 or 3 audits either by telephone or online.

For each type and level of audit, annual kWh savings are calculated by difference in annual pre-post kWh for the comparison group from the difference pre-post kWh for the particular audit category. For example, using the values reported in Table 5-6, annual kWh savings for a CEI customer receiving a Level 2 / 3 online audit are calculated as 850.38 – 402.09 = 448.29 kWh savings per year. The annual kWh savings values determined through these calculations are reported by utility and type and level of audit in

Table 5-7.

The average kW reductions during critical peak hours per participant are reported in Table 5-8. As defined by the PUCO, critical peak hours occur on weekdays during June, July, and August from 3 PM to 6 PM.

Table 5-6: Differences in Pre and Post Audit Annual kWh per Participant by Utility and Audit Method and Level

CEI					
Type and Level of Audit	***HDD per Day***	***CDD per Day***	***Daily kWh, Pre***	***Daily kWh, Post***	***Difference in Annual Pre-Post kwh***
Comparison	15.337	1.696	27.722	26.620	402.087
Telephone, Level 1	15.337	1.696	42.519	42.519	0.000
Telephone, Level 2 / 3	15.337	1.696	38.119	35.426	983.027
Online, Level 1	15.337	1.696	36.830	34.989	671.740
Online, Levels 2 / 3	15.337	1.696	38.489	36.159	850.383
OE					
Type and Level of Audit	***HDD per Day***	***CDD per Day***	***Daily kWh, Pre***	***Daily kWh, Post***	***Difference in Annual Pre-Post kwh***
Comparison	16.080	1.823	28.278	26.712	571.748
Telephone, Level 1	16.080	1.823	42.519	42.519	0.000
Telephone, Level 2 / 3	16.080	1.823	38.921	35.707	1173.080
Online, Level 1	16.080	1.823	37.564	35.178	870.680
Online, Levels 2 / 3	16.080	1.823	39.300	36.363	1071.872
TE					
	HDD per Day	***CDD per Day***	***Daily kWh, Pre***	***Daily kWh, Post***	***Difference in Annual Pre-Post kwh***
Comparison	16.972	1.524	27.850	26.486	497.694
Telephone, Level 1	16.972	1.524	43.340	43.340	0.000
Telephone, Level 2 / 3	16.972	1.524	38.704	35.850	1041.718
Online, Level 1	16.972	1.524	37.102	35.070	741.765
Online, Levels 2 / 3	16.972	1.524	38.857	36.283	939.706

Table 5-7: Annual kWh Savings per Customer for 2013 OA Participants by Utility and Type and Level of Audit

Type and Level of Audit	CEI	OE	TE	Weighted Average across Utilities
Telephone, Level 1	0	0	0	0
Telephone, Level 2 / 3	580.94	601.33	544.02	586.55
Online, Level 1	269.65	298.93	244.07	280.15
Online, Level 2 / 3	448.30	500.12	442.01	474.75

Weighted average across utilities calculated using weights based on percentages of 2013 OA participants coming from different utilities.

Table 5-8: kW Reduction per Hour per Participant during Critical Peak Hours Summarized by Audit Method and Level of Audit

Type and Level of Audit	CEI	OE	TE	Weighted Average across Utilities
Telephone, Level 1	-	-	-	0
Telephone, Level 2 / 3	0.43	0.33	0.39	0.37
Online, Level 1	0.08	0.08	0.12	0.09
Online, Level 2 / 3	0.15	0.15	0.19	0.16

Weighted average across utilities calculated using weights based on percentages of 2013 OA participants coming from different utilities, per Table 5-4.

5.1.6 Online Audits Gross Annual kWh Savings

Program-level savings for the 2013 OA program were determined by multiplying audit savings results from

Table 5-7 by the number of participants who received audits by different methods and levels in the different service territories. The program-level kWh savings by utility and audit method are shown in Table 5-9. Total kWh savings for the 2013 OA program were determined to be 6,254,007 kWh.

Table 5-9: Program-Level Electric Energy Savings (kWh) for 2013 OA Program by Utility and Type and Level of Audit

CEI					
	Telephone Level 1	***Telephone Level 2/3***	***Online Level 1***	***Online Level 2/3***	***Totals***
kWh saved per participant	-	581	270	448	
Number of participants	34	1,342	2,438	1,165	4,979
Total kWh saved	-	779,621	657,413	522,264	1,959,299
OE					
	Telephone Level 1	***Telephone Level 2/3***	***Online Level 1***	***Online Level 2/3***	***Totals***
kWh saved per participant	-	601	299	500	
Number of participants	65	2,420	3,527	1,857	7,869
Total kWh saved	-	1,455,223	1,054,335	928,730	3,438,287
TE					
	Telephone Level 1	***Telephone Level 2/3***	***Online Level 1***	***Online Level 2/3***	***Totals***
kWh saved per participant	-	544	244	442	
Number of participants	20	664	1,127	498	2,309
Total kWh saved	-	361,232	275,067	220,122	856,421
Combined Totals across Utilities					
	Telephone Level 1	***Telephone Level 2/3***	***Online Level 1***	***Online Level 2/3***	***Totals***
Number of participants	119	4,426	7,092	3,520	15,157
Total kWh saved	-	2,596,076	1,986,815	1,671,116	6,254,007

5.1.7 Online Audits Gross Peak Demand (kW) Reduction

Program-level critical peak demand impacts for the 2013 OA program were determined by applying the per audit kW reduction values from Table 5-8. The program-level kW reductions by utility and type and level of audit are shown in Table 5-10. Total kW reductions for the 2013 OA program were determined to be about 2,833 kW.

Table 5-10: Program-Level kW Reductions during Critical Peak Hours by Utility and Type and Level of Audit

CEI					
	Telephone Level 1	***Telephone Level 2/3***	***Online Level 1***	***Online Level 2/3***	***Totals***
kW reduction per participant	-	0.43	0.08	0.15	
Number of participants	34	1,342	2,438	1,165	4,979
Total kW reduction	-	583	197	172	952
OE					
	Telephone Level 1	***Telephone Level 2/3***	***Online Level 1***	***Online Level 2/3***	***Totals***
kW reduction per participant	-	0.33	0.08	0.15	
Number of participants	65	2,420	3,527	1,857	7,869
Total kW reduction	-	808	298	288	1,393
TE					
	Telephone Level 1	***Telephone Level 2/3***	***Online Level 1***	***Online Level 2/3***	***Totals***
kW reduction per participant	-	0.39	0.12	0.19	
Number of participants	20	664	1,127	498	2,309
Total kW reduction	-	261	133	93	487
Combined Totals across Utilities					
	Telephone Level 1	***Telephone Level 2/3***	***Online Level 1***	***Online Level 2/3***	***Totals***
Number of participants	119	4,426	7,092	3,520	15,157
Total kW reduction	-	1,652	628	552	2,833

5.1.8 Online Audits Findings from the Persistence Analysis

In addition to the analysis of first year OA participants, a major aspect of the 2013 evaluation was to examine the degree to which the savings achieved by participants in the OA program in 2010, 2011 and 2012 persisted through 2013.

Findings on Persistence from Analysis of Billing Data

The procedure for using regression analysis of billing data to examine the persistence of savings for earlier cohorts of participants in the OA program was described in **Error! Reference source not found.**. The results of applying that procedure are presented here.

The results of applying the regression analysis results to determine savings persistence are reported in

Table 5-11.

- For the 2010 cohort, the ratios of energy use in 2013 to pre-audit energy use show a lowering of energy use for all level 2/3 audit participants[63]. Moreover, that the ratio of energy use for the 2013 comparison group to that for the 2010 comparison group is 101.83 percent, indicating that energy use among non-participants had increased. Taking these observations together imply that savings for the audit groups had persisted.
- For the 2011 cohort, all of the ratios of energy use in 2012 to pre-audit energy use show a lowering of energy use. For this case, however, the ratio of energy use for the 2012 comparison group to that for the 2011 comparison group is 96.25 percent, indicating that energy use among non-participants had decreased. Moreover, the decrease for non-participants was greater than for any of the audit groups. These observations imply that program-induced savings for the 2011 audit groups had not persisted.
- For the 2012 cohort, the ratios of energy use in 2013 to pre-audit energy use show a lowering of energy use for all audit participants. Moreover, that the ratio of energy use for the 2013 comparison group to that for the 2012 comparison group is 99.56 percent, indicating that energy use among non-participants had remained the same. Taking these observations together imply that savings for the audit groups had persisted.

[63] The regression analyses of 2010 participants who only engaged in level 1 audits were not statistically significant, indicating that savings likely did not persist.

Table 5-11: Results of Applying Regression Analysis of Billing Data to Determine Persistence of Savings for Past Participants in the OA Program

Type and Level of Audit	***Estimated Per-Customer Annual kWh Usage (Weather Normalized)***		***Ratio of Energy Use, 2013 to Pre-Audit***
	Pre-Audit	***In 2013***	
2010 Cohort			
Telephone, Level 2&3	13,755	13,382	97.29%
Online, Level 2&3	13,292	12,748	95.91%
2011 Cohort			
Telephone, Level 1	11,645	11,536	99.06%
Telephone, Level 2&3	12,541	12,246	97.65%
Online, Level 1	12,094	11,894	98.35%
Online, Level 2&3	12,878	12,602	97.86%
2012 Cohort			
Telephone, Level 2&3	13,045	12,631	96.82%
Online, Level 1	12,381	11,897	96.10%
Online, Level 2&3	12,880	12,316	95.62%
Comparison Groups			
Non-Participants	***Estimated Per-Customer Annual kWh Usage (Weather Normalized)***		
For 2010 Cohort	9,373		
For 2011 Cohort	9,916		
For 2012 Cohort	9,587		
For 2013 Cohort	9,545		
Ratio, 2013 to 2010	101.83%		
Ratio, 2013 to 2011	96.25%		
Ratio, 2013 to 2012	99.56%		

Findings on Persistence from Survey Responses

Samples of customers who received either a telephone audit or an online audit through the OA program in 2010, 2011 or 2012 were surveyed to determine whether they continued energy savings practices.

Table 5-12 reports on actions that the surveyed customers reported taking in response to the audit they received. For 2010, 2011 and 2012, customers receiving an online audit were more likely to report taking energy saving actions than customers who received a telephone audit. Behavioral actions were the most likely to have been taken.

Table 5-12: Percentages of Participants in 2010, 2011 and 2012 OA Program Taking Different Types of Energy Saving Actions

Type of Energy Saving Action	***2010 OA Participants***		***2011 OA Participants***		***2012 OA Participants***	
	Telephone Audits	***Online Audits***	***Telephone Audits***	***Online Audits***	***Telephone Audits***	***Online Audits***
Structural (Equipment)	16.5%	21.2%	3.2%	28.1%	9.3%	23.1%
Behavioral	28.4%	63.5%	22.6%	68.4%	39.5%	64.2%
No Changes Made	44.0%	16.1%	45.2%	16.7%	37.2%	13.4%
Did not know / did not recall	18.4%	11.0%	32.3%	8.8%	18.6%	11.9%
Sample sizes	n = 109	n = 137	n = 31	n = 114	n = 43	n = 134

Table 5-13 reports the persistence of structural and behavioral changes for the various cohorts. For those customers taking actions, persistence rates are generally over 90 percent.

Table 5-13: Rates of Persistence for Structural and Behavioral Changes for Participants in 2010, 2011 and 2012 OA Program

	2010 OA Participants		***2011 OA Participants***		***2012 OA Participants***	
	Telephone Audits	***Online Audits***	***Telephone Audits***	***Online Audits***	***Telephone Audits***	***Online Audits***
Percent making structural changes	16.5%	21.2%	3.2%	28.1%	9.3%	23.1%
Percent still having structural changes in place	100.0%	96.4%	100.0%	96.9%	100.0%	96.7%
Percent making behavioral changes	28.4%	63.5%	22.6%	68.4%	39.5%	64.2%
Percent still following changed behavioral practices	92.9%	94.3%	85.7%	94.8%	100.0%	97.7%

5.2 Detailed Evaluation Findings: Energy Conservation Kits

This section presents the findings of the impact evaluation of the Energy Conservation Kits subprogram.

5.2.1 Verification of Energy Conservation Kits Program Population

ADM delivered a survey to a random sample of program participants contained within the SSRS database. The purpose of the survey was to verify receipt of kits and to determine the in-service rate (ISR) for measures contained in the kits. Table 5-14 shows the delivery totals by kit type by operating company.

Table 5-14: Total Kits Delivered by Operating Company

Operating Company	***CEI***	***OE***	***TE***	***Total***
Standard Kit	70,670	103,460	33,357	207,487
All Electric Kits	8,066	14,732	4,857	27,295
Schools Kits	667	355	875	1,897
Total Delivered Kits	**79,403**	**118,547**	**39,089**	**236,679**

The ISR, as determined from the participant survey, for each measure in the direct mail kit is shown in Table 5-15. The participant survey findings resulted in adjustments to the

TRM measure specific algorithms which were applied for *ex post* analysis. The realization rates for each type of kit for kWh savings and kw reductions were impacted as result. For the measures included in both standard and all electric kits, the CFL measures and furnaces were found to have lower in service rates than assumed by the TRM while LED night lights were found to have a higher in service rate than assumed by the TRM. A key finding from the direct mail kits survey was that the Companies customers installed on average 70% of the LED nightlights; however, 36% of these nightlights did not replace an existing inefficient nightlight. For the all-electric kits, the aerator and low flow showerhead measures were found to have higher in service rates than assumed by the TRM.

Table 5-15: Impact Evaluation ISRs Determined by Survey (Residential Kits)

Measure	***N***	***Measure In-Service Rate (ISR)***
13W CFLs	257	70%
20W CFLs	257	63%
26W CFLs	257	56%
LED Night Lights	189	Replacement for existing night light: 34% Directly installed night light: 36%
Furnace Whistle	256	16%
7 Plug Smart Strip	240	47%
Faucet Aerator*	33	18%
Showerhead*	27	26%

*This measure only contained in the all-electric kits

The ISR for each measure in the direct mail kit is shown in Table 5-16. The ISR for faucet aerators for schools kits accounts for how many of the aerators were installed in homes with electric water heaters as a percentage of the total number of schools kits distributed.

Table 5-16: Impact Evaluation ISRs Determined by Survey (Schools Kits)

Measure	***N***	***Measure In-Service Rate (ISR)***
13W CFLs	257	70%
18W CFLs	161	69%
LED Night Lights	154	Replacement for existing night light: 45% Directly installed night light: 50%
Faucet Aerator	132	12%

5.2.2 Energy Conservation Kits Gross Annual kWh Savings

Table 5-17: Ex Post Annual kWh Savings by Kit and Operating Company

Operating Company	*Ex Ante kWh*	*Ex Post kWh*	*Realization Rate*
Standard Kit Measures			
CEI	37,500,323	27,313,159	73%
OE	54,904,099	39,989,105	73%
TE	17,699,906	12,891,632	73%
Total for Standard Kit Measures	**110,104,329**	**80,193,895**	**73%**
All Electric Kit Measures			
CEI	4,706,734	4,155,189	88%
OE	8,386,916	7,404,119	88%
TE	2,834,545	2,502,387	88%
Total Numbers for All Electric Kit Measures	**15,928,195**	**14,061,694**	**88%**
School Kit Measures			
CEI	117,926	104,901	89%
OE	62,764	55,832	89%
TE	154,700	137,614	89%
Total Numbers for Schools Kits Measures	**335,390**	**298,347**	**89%**
Grand Total	**126,367,914**	**94,553,937**	**75%**

5.2.3 Energy Conservation Kits Gross Peak Demand (kW) Reduction

Table 5-18: Ex Post Annual kW Reduction by Kit and Operating Company

Operating Company	*Ex Ante kW*	*Ex Post kW*	*Realization Rate*
Standard Kit Measures			
CEI	3,745	2,930	78%
OE	5,483	4,290	78%
TE	1,768	1,383	78%
Total for Standard Kit Measures	**10,996**	**8,603**	**78%**
All Electric Kit Measures			
CEI	468	431	92%
OE	834	769	92%
TE	282	260	92%
Total Numbers for All Electric Kit Measures	**1,583**	**1,460**	**92%**
School Kit Measures			
CEI	14	11	79%
OE	7	6	79%
TE	18	14	79%
Total Numbers for Schools Kits Measures	**40**	**31**	**79%**
Grand Total	**12,619**	**10,094**	**80%**

5.3 Detailed Evaluation Findings: New Homes

This section presents the findings of the impact evaluation of the New Construction subprogram.

5.3.1 Verification of New Homes Program Population

As a first step toward determining program level kWh and kW impacts, ADM reviewed program tracking data provided by PSD as well as the final SSRS database information.

5.3.2 New Homes 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 5-19Table 5-19Table 5-19 Table 5-19Table 5-19Table 5-19Table 5-19shows the quantities of homes, ex ante and ex post kWh, and realization rates for each stratum. For

the final sampling plan, M&V sites were selected by EDC and by builder. Selecting sites by builder ensured a valid sample was taken across the complete population for each EDC. For each EDC, the builders were separated into strata based on number of homes built as well as size of homes. The final program *ex post* verified energy savings was 2,622,297, resulting in a program level realization rate of 88%.

Table 5-20 shows the variance of energy savings and realization rates by Company. The main cause of variation in the kWh savings was the differences in software versions and incorrect values for percentage of energy efficient lighting. As a first step in calculating gross annual kWh savings, ADM reran the builders Rem/Rate models to verify *ex ante* savings estimates. Many of the models submitted were completed using older versions of Rem/Rate and showed significant changes in estimated energy savings when updated to more recent versions of the simulation software. For the 59 sites included in the M&V sample, the total *ex ante* estimated savings as reported in the SSRS database was 265,481 kWh. When these models were run using more recent versions of Rem/Rate, the *ex ante* estimated savings was reduced to 221,352 kWh, a 16% reduction in *ex ante* estimated savings. Using older versions of Rem/Rate, results in higher estimated energy savings and is the single largest impact on program level realization rates.

During the *ex post* analysis, ADM adjusted model parameters to match the information found during site visits, QA/QC checks, or other sources of data used for verification. The most common change to model parameters was the percentage of energy efficient lighting for each sampled site. If the percentage of lighting differed between the available data and the model, ADM would make the necessary changes to the Rem/Rate model as required. Other less common causes of variation between *ex ante* and *ex post* savings were SEER values on AC units, system efficiencies of water heaters, and higher tested duct leakages than modeled.

Table 5-19: New Construction Energy Impacts by Strata

Strata	Ex Ante Total (kWh)	Ex Ante Sampled (kWh)	Sites Included in Sample	Ex Post Sampled (kWh	Ex Post Total (kWh)
CE					
C1	310,430	23,119	10	24,326	326,448
C2	327,145	12,270	4	11,784	319,211
C3	33,384	33,384	1	26,170	26,170
C4	189,692	29,660	7	20,469	122,752
C5	8,618	1,711	1	1,500	7,555
OE					
O1	609,038	33,869	14	32,841	593,265
O2	577,673	28,222	11	26,244	540,586
O3	441,935	9,694	4	6,476	299,100
O4	84,881	13,900	1	7,808	47,680
O5	64,913	33,245	1	27,275	53,256
O6	12,657	5,848	1	4,547	9,841
TE					
T1	309,949	40,559	4	31,912	276,433
Program Totals	**2,970,315**	**265,481**	**59**	**221,352**	**2,622,297**

Table 5-20: Variance of Energy Savings and Realization Rate

EDC	Ex Ante Annual Energy Savings (kWh)	Ex Post Annual Energy Savings (kWh)	Realization Rate
CEI	869,269	802,136	92%
OE	1,791,097	1,543,728	86%
TE	309,949	276,433	89%
Total	**2,970,315**	**2,622,297**	**88%**

5.3.3 New Homes 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 0.5 (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. Gross peak demand for the 2013 program year was 449 kW.

5.4 Detailed Evaluation Findings: Behavioral

5.4.1 Results of Regression Analysis

The results of the regression analysis (estimated coefficients and their corresponding standard errors) for the models used for determining kWh savings are reported in Table 5-21. Definitions for the variables in the model are provided in

Table 5-22.

Table 5-21: Results of Regression Analysis of Billing Data for Models Used to Estimate kWh Savings for Participants in the 2013 BMod Program

Coefficient	*OE*		*CEI*		*TE*	
	Pooled OLS	**Mixed Effects**	**Pooled OLS**	**Mixed Effects**	**Pooled OLS**	**Mixed Effects**
Intercept	47.495*** (0.069)	47.469*** (0.124)	35.943*** (0.078)	35.863*** (0.129)	38.963*** (0.087)	38.923*** (0.141)
HDD55	0.619*** (0.003)	0.619*** (0.002)	0.707*** (0.003)	0.709*** (0.003)	0.647*** (0.004)	0.647*** (0.003)
CDD75	1.93*** (0.014)	1.923*** (0.012)	4.354*** (0.021)	4.392*** (0.017)	4.125*** (0.024)	4.132*** (0.02)
Treat	0.106*** (0.068)	0.126*** (0.141)	-0.007*** (0.069)	-0.006*** (0.148)	0.18*** (0.089)	0.2*** (0.187)
Post	-4.971*** (0.1)	-5.042*** (0.084)	***0.23 (0.098)	***0.165 (0.078)	-2.339*** (0.112)	-2.432*** (0.094)
Post x Treat	-0.56388*** (0.11758)	-0.59985*** (0.09778)	-0.37041*** (0.11904)	-0.36042*** (0.09525)	-0.26062*** (0.15767)	-0.3124*** (0.13239)
R-squared	0.062	0.358 (marginal R^2: 0.063)	0.08	0.417 (marginal R^2: 0.081)	0.091	0.366 (marginal R^2: 0.092)

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5-22: Definitions for Variables in Regression Models

Variable Name	Variable Definition	Measurement Scale
kWh per day	Average daily kWh for customer during billing period	Continuous variable
Cooling degree-days per day	Cooling degree days, referenced to base temperature of 70°F during billing period	Continuous variable
Heating degree-days per day	Heating degree days, referenced to base temperature of 55°F during billing period	Continuous variable
Post	Post Audit indicator variable (0 = pre-HERS; 1 = post-HERS	Binary variable
Treat	Recipient of HERs indicator variable	Binary variable
Post x Treat	Indicator variable that interacts Post and Treat variables	Binary variable

5.4.2 kWh Savings and kW Reductions for Participants in 2013 BMod Program

The results from the regressions reported in Table 5-21 were used to determine annual kWh savings and kW reductions per participant for the 2013 BMod program. All coefficients of interest that were significant at the 90% confidence level were used for this purpose.

As mentioned in the methodology section, the estimate of the "Post x Treat" coefficient gives the average change in daily energy consumption from pre-HER to post-HER. For the first "Wave" of customers receiving HERs, the post period in 2013 extends from, at the earliest, August 2013 up to December 2013, meaning customers in the treatment group had received HERs for less than a full calendar year. However, to arrive at an estimate of energy savings on an annual basis (365 days a year), the value of "Post x Treat" is multiplied by 365.

Table 5-23: Annual Savings and Reductions
per Customer for 2013 BMod Participant by Utility

Savings Type	CEI	OE	TE	Weighted Average across Utilities
kWh Savings	131.55	218.95	114.03	175.24
kW Reduction	0.360	0.600	0.312	0.480

Weighted average across utilities calculated using weights based on percentages of 2013 BMod participants across the Companies.

5.4.3 Program-Level kWh Savings

Program-level savings for the 2013 BMod program were determined by multiplying the per customer savings results from Table 5-23 above by the number of participants who received HERs in the different service territories. The program-level kWh savings by utility are shown in Table 5-24 below. Total kWh savings for the 2013 BMod program were determined to be 12,792,850 kWh.

Table 5-24: Program-Level Electric Energy Savings (kWh) for 2013 BMod Program by Utility

Operating Company	**Estimated Daily Savings (kWh/day)**	***Estimated Annual Savings (kWh/year)***	**# Of participants**	***Program Annual Savings (kWh)***
Ohio Edison	0.59985	218.95	38,500	8,429,575
Cleveland Illuminating	0.36042	131.55	24,500	3,222,975
Toledo Edison	0.3124	114.03	10,000	1,140,300
Totals			73,000	12,792,850

5.4.4 Program-Level Critical Peak Demand Impacts

Program-level critical peak demand impacts for the 2013 BMod program were determined by applying the per customer kW reduction values. The program-level kW reductions by utility are shown in Table 5-25. Total kW reductions for the 2013 BMod program were determined to be about 1,460 kW.

Table 5-25: Program-Level kW Reductions During Critical Peak Hours by Utility

Operating Company	***Estimated Daily Savings (kWh/day)***	***Estimated Per-Participant Demand Reduction (kW)***	***# Of participants***	***Program Demand Reductions (kW)***
Ohio Edison	0.59985	0.025	38,500	962.26
Cleveland Illuminating	0.36042	0.015	24,500	367.93
Toledo Edison	0.3124	0.013	10,000	130.17
Totals			73,000	1460.35

6. Detailed Process Evaluation Findings

This chapter presents the process evaluation findings for the Home Performance Program.

6.1 Audits

6.1.1 Comprehensive Home Audit

This section provides a summary of findings organized by topics of interest from the Comprehensive Home Audit process evaluation completed by NMR.

Tracking Data Analysis

A few contractors accounted for the majority of rebated measures. While a total of 157 contractors participated in the program, three contractors accounted for 45% of all rebates processed and virtually all of the insulation rebates (94%).

The Companies retained most (92%) of the contractors that signed up to participate in the 2012 program year. For the 2013 program year, program administrators successfully recruited 157 participating contractors, but only 22 contractors worked on a significant number of projects in 2013—11 less than in 2012. Program staff should focus efforts on retaining active contractors. To achieve program savings goals, the Companies should consider focusing recruitment efforts on contractors who specialize in areas that would maximize program savings, such as duct sealing and insulation.

Marketing, Outreach, and Education Efforts

According to the contractors interviewed, homeowners became aware of the program primarily through contractor sales presentations and marketing efforts. Contractors became aware of the program from program staff members, customers, and other contractors. The Companies provided participating contractors with a variety of resources to help promote the program, including customer education packets and the authorization to use the program logo on their company's website, promotional materials, and business cards.

Contractors believe that marketing efforts could be improved through additional bill inserts and targeted mass media. In addition to future marketing efforts, the Companies should continue to encourage and support contractors to market the program independently, as most customers learn about the program through contractors. Program managers should

view contractors as a resource and consider using a contractor panel when reviewing marketing plans and materials.

Financial Incentives and Rebate Processing

Program staff members and contractors acknowledge that the current cost of an audit might be prohibitive to some customers, but are generally in agreement that the audit cost is reasonable considering the services provided by the audit.

Program staff members indicated that, whereas the rebate form states that rebates will be processed within 90 days, the Companies actually provide the rebates within 30-50 days, on average. However, contractors indicated that some of their customers have had to wait upwards of a year to receive their rebate due to resubmitted rebate forms and accompanying documents. According to program staff members, improperly filled out and incomplete forms are the two main causes for delays in rebate processing. Including a picture of the faceplate could strengthen the quality control procedures. Two of the four less active contractors identified that they did not participate in the program due to excessive paperwork generated from rejected rebate applications.

Program Training and Quality Control

Just under one-half (46%) of all contractors interviewed said that they had attended training for the program. About one half of all active and less active contractors who did not attend training would like to attend training in the future. Program managers should increase communication with contractors regarding trainings. For example, three active contractors were not aware of training opportunities and missed training that they would have attended if they were aware of the training session.

The CHA program has a robust quality control process that includes onsite follow-up visits for audits and measure installations.

Rebates, Program Training, and Quality Control

Following financial incentives, program simplicity was the strength most frequently identified by contractors.

Among contractors, the level of satisfaction with the program is mixed. When asked to rate their level of satisfaction on a scale of 1 (very satisfied) to 5 (very dissatisfied), six out of fourteen active contractors and seven out of ten less active contractors were satisfied (1 or 2). Contractors specializing in windows were more satisfied with the program than contractors specializing in measures with relatively lower rebates, such as insulation.

Overall, program staff members and contractors indicated that there should be additional marketing for the program. Contractors would like to see Honeywell or the Companies market the program through mass media.

Active and less active contractors expressed frustration when trying to communicate with program staff members. Three contractors indicated that they lacked a point of contact for the program. Contractors who did not cite specific communication problems indicated that inconsistent communication was a program weakness and recommended increased communication between the program and contractors. The communication disconnect experienced by contractors was a two part challenge in 2013 that consisted of contractors waiting for the Comprehensive Home Audit Plan to be approved and the associated learning curve once the 2013 plan was instituted.

Customer Satisfaction

Responses to customer satisfaction survey questions are summarized in Table 6-1below.

Table 6-1: Customer Satisfaction – Comprehensive Home Audit

Aspect of Program	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied	Total Sample
Rebate application process	1%	4%	10%	34%	50%	141
Rebate dollar amount you received	1%	2%	8%	35%	49%	141
Measures impact on saving energy	2%	2%	10%	40%	42%	141
Measures impact on increased comfort	1%	1%	10%	34%	52%	141

6.1.2 Online Audits

This section reports findings from the process evaluation of the OA Program. Findings are based on survey responses from samples of customers who participated in the OA program in 2013. The findings also draw on survey responses from two samples of nonparticipants. Table 6-2 shows the number of completions for each survey group.

As indicated in Table 6-2, the process evaluation's findings are based on the results of five telephone surveys administered to 260 of the Companies' customers.

Table 6-2: Surveys Completed for Process Evaluation of 2013 OA Program

Survey Group	***Surveys Completed***
Online audits, Level 1	64
Online audits, Level 2 / 3	76
Telephone audits, all levels	60
Non-participant comparison group	60
Total	260

The customer surveys that were utilized for process evaluation of the OA Program addressed the following research questions:

- How did customers learn of the availability of the home energy audit?
- What actions did telephone audit users take to save energy? How did these actions differ from the energy saving actions of online audit users or a control group?
- How did the energy saving actions of online audit users at Level 1 differ from the energy saving actions of online audit users at Levels 2 and 3?

Characteristics of Dwellings for 2013 OA Program Participants

As background for the process evaluation, tabulations were prepared to compare characteristics of the dwellings of participants in the 2013 OA program to those of participants. These comparisons are provided in Table 6-3, Table 6-4,

Table 6-5, and Table 6-6.

Table 6-3: Type of Dwelling Occupied by 2013 OA Program Participants

Type of Dwelling	***Telephone Audit***	***Online Audit Level 1***	***Online Audit Level 2 / 3***	***Non-Participant Comparison***
Single-family home, detached construction	51.2%	90.63%	65.79%	73.3%
Single-family home, factory manufactured/modular	0.0%	0.0%	0.0%	5.0%
Mobile home	2.0%	0.0%	0.0%	1.7%
Row house	0.0%	0.0%	0.0%	0.0%
Two or Three family attached residence	4.7%	3.13%	10.53%	1.7%
Apartment with 4+ families	16.3%	3.13%	11.84%	10.0%
Condominium	7.0%	1.56%	1.32%	5.0%
Other	14.0%	1.56%	3.95%	1.7%
Don't know	2.3%			1.7%
Totals	100%	100%	100%	100%
Sample sizes	n = 60	n = 64	n = 76	n =60

Table 6-4: Distribution of Owner/Renter for 2013 OA Program Participants

Owned or Rented?	***Telephone Audit***	***Online Audit Level 1***	***Online Audit Level 2 / 3***	***Non-Participant Comparison***
Owned	39.5%	87.50%	53.95%	81.7%
Rented	58.1%	12.50%	46.05%	18.3%
Did not know	2.3%			0.0%
Did not answer				0.0%
Totals	100%	100%	100%	100%
Sample sizes	n = 60	n = 64	n = 76	n =60

Table 6-5: Year Built for Dwellings Occupied by 2013 OA Program Participants

Year Dwelling Was Built	Telephone Audit	Online Audit Level 1	Online Audit Level 2 / 3	Non-Participant Comparison
Before 1960	20.9%	43.75%	36.84%	33.3%
1960-1969	9.3%	10.4%	9.21%	10.0%
1970-1979	16.3%	18.75%	15.79%	16.7%
1980-1989	2.3%	6.25%	5.26%	10.0%
1990-1999	9.3%	4.69%	3.95%	6.7%
2000-2005	0.0%	6.25%	5.26%	10.0%
2006 or Later	11.6%	7.81%	6.58%	8.3%
Did not know	30.2%	1.56%	1.32%	5.0%
Did not answer	0.0%			0.0%
Totals	100%	100%	100%	100%
Sample sizes	n = 60	n = 64	n = 76	n =60

Table 6-6: Size of Dwelling Occupied by 2013 OA Program Participants (As Measured by Square Feet of Above-Ground Living Space)

Year Dwelling Was Built	Telephone Audit	Online Audit Level 1	Online Audit Level 2 / 3	Non-Participant Comparison
Less than 1,000 square feet	23.3%	7.81%	17.11%	6.7%
1,000-2,000 square feet	37.2%	48.44%	52.63%	53.3%
2,000-3,000 square feet	16.3%	29.69%	17.11%	23.3%
3,000-4,000 square feet	9.3%	6.25%	3.95%	3.3%
4,000-5,000 square feet	0.00%	0.00%	1.32%	0.0%
More than 5,000 square feet	4.7%	4.69%	0.00%	0.0%
Don't know	9.3%	3.13%	7.89%	13.3%
Totals	100%	100%	100%	100%
Sample sizes	n = 60	n = 64	n = 76	n =60

Customers' Experience in Receiving Telephone Audits through 2013 OA Program

About 25 percent of the customers who participated in the 2013 OA program received a telephone energy audit. These customers had called the Companies' Customer Service Center. The survey responses for customers who received a telephone energy audit indicated that a little over two-thirds (70 percent) had called the service center to register a "high bill complaint" or to inquire about their meter reading.

A customer calling the Customer Service Center could discuss different topics with the CSR. Percentages of telephone audit customers discussing different topics are shown in Table 6-7.

Table 6-7: Percentage of Telephone Audit Participants Discussing Different Topics with Customer Service Representatives

Topic of Discussion	***Percentage of Customers Discussing Topic during Telephone Audit***
Review changes in bill/usage over time	25.0%
Answer questions about home appliances	0.0%
Find out about top 3 home energy uses	0.0%
Offered literature about saving energy at home	12.5%
Discussion of something else	50.0%
Did not recall	12.5%
Sample size	n = 60

Table 6-8 shows how telephone audit customers rated the helpfulness of the information they received in their discussions with the customer service representatives.

Table 6-8: How Telephone Audit Participants Rated Helpfulness of Information Received in Telephone Conversation with CSRs

How Helpful Was Information Received in Telephone Discussion with CSR?	***Percentage of Customers Responding***
Very helpful	20.9%
Somewhat helpful	32.6%
Neither helpful nor unhelpful	7.0%
Somewhat unhelpful	11.6%
Not at all helpful	14.0%
Did not know / did not recall	14.0%
Sample size	n = 60

Besides conveying information to customers during the telephone conversations, CSRs would also send additional information to the customers. The percentages of telephone audit participants who reported having been sent different types of information are reported in Table 6-9.

Table 6-9: Percentage of Telephone Audit Participants Reporting That They Were Sent Information following Discussion with CSRs

Type of Information Sent	***Percentage of Telephone Audit Customers Reporting They Were Sent Information***
Brochure(s) on Energy Saving Tips	37.2%
PC link to Online Audit software	9.3%
Other	11.6%
Nothing was sent	53.5%
Sample size	n = 60

Table 6-10 shows how customers rated the helpfulness of the information they were sent.

Table 6-10: How Telephone Audit Participants Rated Helpfulness of Information They Were Sent after Telephone Conversation with CSRs

How Helpful Was Information You Were Sent	***Percentage of Customers Responding***
Very helpful	31.3%
Somewhat helpful	25.0%
Neither helpful nor unhelpful	37.5%
Somewhat unhelpful	0.0%
Not at all helpful	0.0%
Did not know / did not recall	6.3%
Sample size	n = 60

Table 6-11 shows the percentages of telephone audit participants in the 2013 OA program who reported making energy saving changes after the audit. Customers were more likely to report taking behavioral actions than structural actions.

Table 6-11: Percentages of Telephone Audit Participants in 2013 OA Program Taking Different Types of Energy Saving Actions

Type of Energy Saving Action	***Telephone Audit***
Structural (Equipment)	4.7%
Behavioral	37.2%
No Changes Made	48.8%
Did not know / did not recall	11.6%
Sample Sizes	n=60

Table 6-12 shows how telephone audit participants rated their satisfaction with the analysis that was provided to them through the telephone audit.

Table 6-12: How Telephone Audit Participants Rated Their Satisfaction with the Analysis They Received through Telephone Audit

Level of Satisfaction	Telephone Audit
Very satisfied	32.6%
Somewhat satisfied	14.0%
Neither satisfied nor dissatisfied	16.3%
Somewhat dissatisfied	14.0%
Very dissatisfied	11.6%
Did not know	11.6%
Sample Sizes	n=60

Customers' Experience in Receiving Online Audits through 2013 OA Program

A little less than 75 percent of the customers who participated in the 2013 OA program received an online energy audit. The software for performing the online version of the home energy audit (i.e., the *Home Energy Analyzer*) was advertised in several ways: online, by mail, and to a small degree through mass media. Table 6-13 shows how customers receiving an online energy audit became aware of the *Home Energy Analyzer*. Most customers reported becoming aware of the *Home Energy Analyzer* through their local electric company's website.

Table 6-13: Means by Which Customers Became Aware of the Online Audit

Source of Awareness for Online Audit	Online Audit Level 1	Online Audit Level 2 / 3	All Online Audit
Company website	50.00%	57.89%	54.29%
Energy Save Ohio Website	6.25%	15.79%	6.42%
Print/Newspaper Ad	5%	1.31%	0.64%
Word of Mouth	7.81%	2.63%	5%
Other	32.82%	32.89%	32.86%
Total	n = 64	n = 76	n = 140

The reasons that customers gave for using the online energy audit software are reported in Table 6-14. While a "high bill" was one reason why customers used the online *Home Energy Analyzer*, the online users were also motivated to use the *Analyzer* to investigate how they could be more efficient in using electricity in their home.

Table 6-14: Reasons Why Customers Used Home Energy Analyzer

Reasons for Using Home Energy Analyzer	Online Audit Level 1	Online Audit Level 2 / 3	All Online Audit
Investigate	40.63%	51.32%	46.43%
Financial (high bill)	42.19%	53.95%	48.57%
Conserve energy	46.88%	38.16%	42.14%
Other	1.56%	1.32%	1.43%
Did not know / did not recall	1.56%	2.63%	2.14%
Total	n =64	n = 76	n = 140

As with the telephone version of the home energy audit, the online version allowed customers to review changes in usage over time and to answer questions about home appliance usage. It also could answer customer questions about weatherizing a house or provide detailed energy savings ideas. Table 6-15 shows the percentages of participants who used different activities during an online audit.

Table 6-15: Percentage of Customers Participating in Different Audit Activities

Audit Activities	Online Audit Level 1	Online Audit Level 2 / 3	All Online Audits
Review changes in usage	46.88%	52.63%	50.00%
Answer questions about home appliances	26.56%	53.95%	41.43%
Answer questions about weatherizing home	18.75%	27.63%	23.57%
Obtain detailed energy saving ideas for home	50.00%	61.84%	56.43%
Sample Size	n = 64	n = 76	n = 140

As shown in Table 6-16, nearly half of the customers used the *Online Audit* program to obtain detailed energy savings ideas for their homes. The kinds of ideas that were reported to customers are shown in Table 5-22.

Table 6-16: Percentages of Customers Provided Different Types of Energy Savings Ideas through Online Audit

Types of Energy Savings Ideas	***Online Audit Level 1***	***Online Audit Level 2 / 3***	***All Online Audit***
No cost / low cost ways to save energy immediately	42.19%	55.26%	49.29%
Ways to save energy that require investment but will pay off	17.19%	27.63%	22.86%
Ways to save energy that would not be cost-justified	4.69%	13.16%	9.29%
Other ways to save energy	0.00%	0.00%	0.00%
Sample sizes	n = 64	n =76	n = 140

Table 6-17 shows how customers rated the helpfulness of the information they received through their use of the *Online Audit*.

Table 6-17: How Online Audit Participants Rated Helpfulness of Information They Received through Online Audit

How Helpful Was Information Provided to You by Online Audit	***Online Audit Level 1***	***Online Audit Level 2 / 3***	***All Online Audit***
Very helpful	18.75%	19.74%	19.29%
Somewhat helpful	54.69%	59.21%	57.14%
Neither helpful nor unhelpful	14.06%	11.84%	12.86%
Somewhat unhelpful	1.56%	0.00%	0.71%
Not at all helpful	1.56%	0.00%	0.71%
Did not know / did not recall	9.38%	9.21%	9.29%
Sample sizes	n = 64	n = 76	n = 140

Table 6-18 shows the percentages of online audit participants in the 2013 OA program who reported making energy saving changes after the audit. Customers were more likely to report taking behavioral actions than structural actions.

Table 6-18: Percentages of Participants in 2013 OA Program Taking Different Types of Energy Saving Actions

Type of Energy Saving Action	Online Audit Level 1	Online Audit Level 2 / 3	All Online Audits
Structural (Equipment)	23.44%	14.47%	18.57%
Behavioral	65.63%	72.37%	69.29%
No Changes Made	21.88%	17.11%	19.29%
Did not know / did not recall	3.13%	5.26%	4.29%
Sample Sizes	n=64	n=76	n = 140

Table 6-19 shows how online audit participants rated their satisfaction with the OA program.

Table 6-19: How Online Audit Participants Rated Their Satisfaction with OA Program

Level of Satisfaction	Online Audit Level 1	Online Audit Level 2 / 3	All Online Audits
Very satisfied	28.13%	27.63%	27.86%
Somewhat satisfied	35.94%	51.32%	44.29%
Neither satisfied nor dissatisfied	26.56%	13.16%	19.29%
Somewhat dissatisfied	1.56%	1.32%	1.43%
Very dissatisfied	0.00%	0.00%	0.00%
Did not know	7.81%	6.58%	7.14%
Sample Sizes	n=64	n=76	n = 140

6.2 Energy Conservation Kits

This section provides a summary of findings organized by topics of interest from the Energy Conservation Kits process evaluation.

6.2.1 Direct Mail Kits

This section presents key findings from surveys conducted with customers who participated in the 2013 Energy Conservation Kit Program provided by the Companies. ADM conducted online and telephone surveys with program participants as part of the evaluation effort for the 2013 Energy Conservation Kit Program. This survey effort was designed to gather information regarding the participant perspective on program

operations and delivery, specifically addressing participant satisfaction with individual program elements. Data collected via participant surveying were used in evaluating:

- Customer awareness of the program;
- Customer implementation of energy efficient equipment;
- Customer decision making; and
- Customer satisfaction with the program.

ADM administered one online survey for each of the Companies, and one telephone survey for participants whose email addresses were not listed in the program tracking data. All survey instruments were identical, and results were combined for the purpose of process evaluation and impact analysis. In total, 315 participants responded to the telephone and online surveys.

Household Characteristics

77 percent of respondents indicated that they have a non-electric water heater. This is fairly correlated with expected kit distribution rates for the program, as the Companies planned to distribute standard (non-electric water heater) kits to approximately 85% of all participants.

Table 6-20: Participant Water Heating Type

Water Heating Type	***Percent of Respondents (n = 315)***
Electric	23%
Non-electric	77%

Respondents also indicated the number of residents who currently live in their household. The average number of residents in participant homes was approximately 2.4 people, with few respondents indicating that more than four people live in their home.

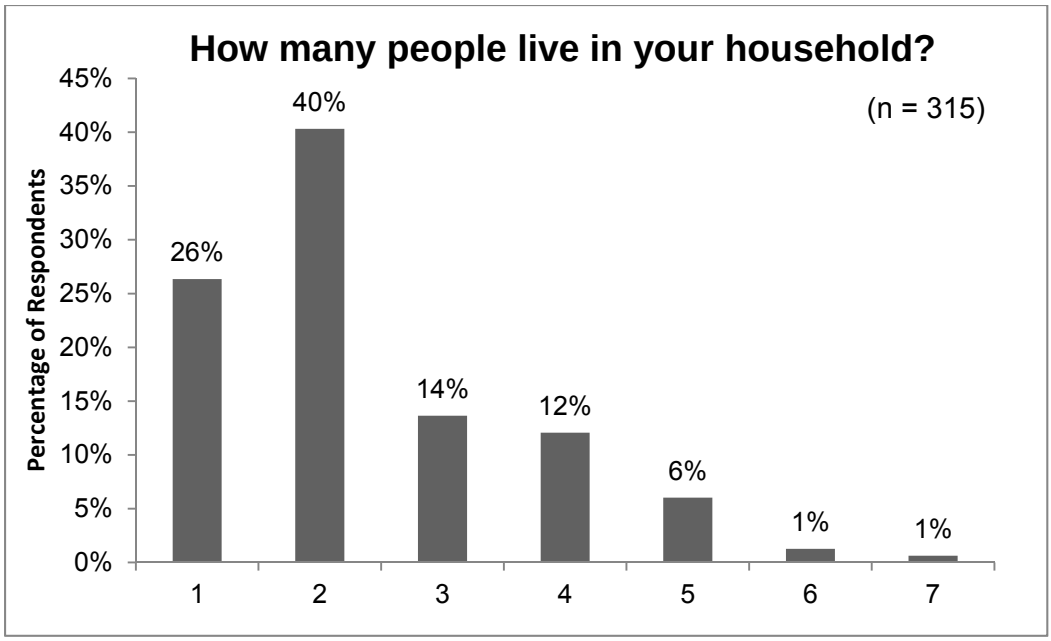


Figure 6-1: Participant Household Population

Customer Awareness of Program

In order to gauge the effectiveness of specific marketing channels, survey respondents were asked a series of questions regarding how they learned about the Energy Conservation Kit Program. First, respondents were asked whether they had initially received an informational postcard in the mail that included a program invitation code. One-quarter of respondents stated that they had received this postcard, and the majority (72%) of these respondents noted that this was how they first learned of the program.

The remaining respondents were asked to specify how they learned about the Energy Conservation Kit Program, and were provided with several options as shown in the following chart. These respondents most commonly reported that they had learned of the program from friends or family members. This is consistent with findings from the program staff interview, where the program manager indicated that word of mouth had been a very effective marketing channel during 2013.

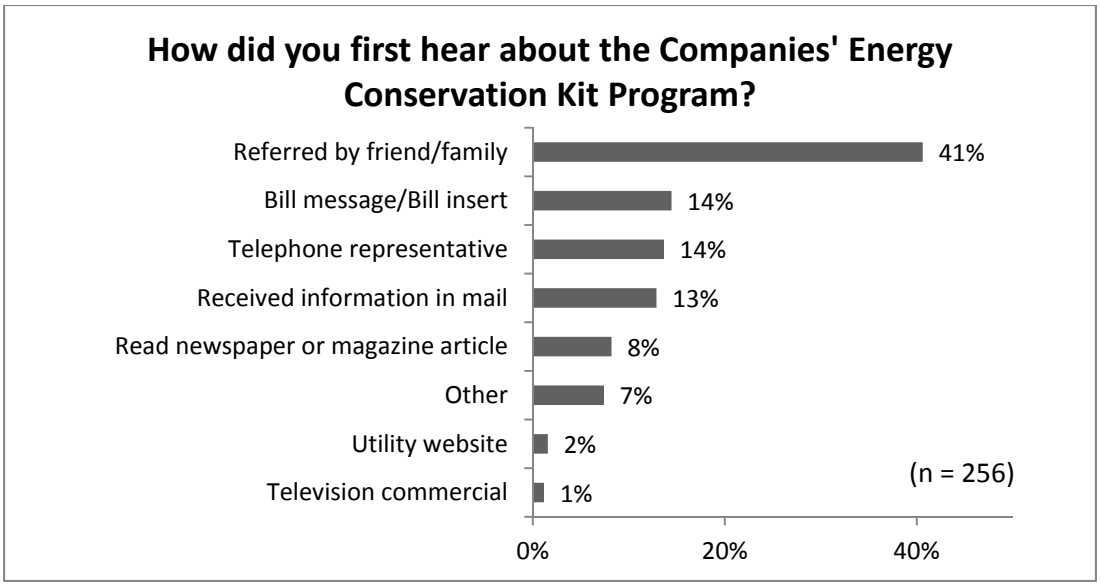


Figure 6-2: How Participants Learned about the Program

Although only a small percentage of respondents indicated that they learned of the program through the utility website, more than one-third of all respondents stated that they enrolled in the program by using the online application. This suggests that the existing marketing channels are effectively directing prospective participants to the Ohio Energy Kit website where they can learn more information about the program and request a kit. A majority of participants stated that they enrolled in the program over the phone, which is consistent with the highly active outbound phone call marketing method used by the Companies to promote the program.

- Online Enrollment Experience: Respondents who stated that they enrolled in the program online were asked additional questions about their enrollment experience. A large majority (94%) of these respondents stated that it was easy to find the application on the program website, and 91% of respondents confirmed that the website had answered all of their questions about the kit and program.
- Telephone Enrollment Experience: Nearly all respondents (96%) who had enrolled via telephone reported that the program representative they had spoken with was polite and courteous. Additionally, 94% of these respondents indicated that the representative had been able to answer all of their questions about the program.

Participant Motivations and Preferences

Survey respondents were asked a series of questions related to their decision making and prior experience with energy efficiency. As displayed in the following table, 46% of respondents indicated that they chose to participate in the program because they wanted

to save energy in their home. This finding suggests that participants are primarily concerned with lowering their energy bills. This is expected, as the Energy Conservation Kit Program is offered as a beneficial tool in reducing residential energy usage and the costs associated with utility bills over time. A large portion (45%) of respondents stated that they participated in the program because it was provided at no additional cost, while 35% of respondents reported that they thought the kit would be useful and valuable.

Twenty-eight percent of respondents cited a recommendation from a friend as a motivational factor in their participation decision. This further supports the importance of word-of-mouth marketing, which appears to have significantly influenced the rate of program awareness and enrollment.

Table 6-21: Factors Motivating Participation

	Response	***Percent of Respondents****	***N***
What factors motivated you to request an Energy Conservation Kit from the Companies?	I was looking for ways to save energy in my home	46%	315
	It was free[64]	45%	315
	The Energy Conservation Kit looked useful and valuable	35%	315
	Recommendation from a friend	28%	315
	Environmental reasons	13%	315
	I needed light bulbs	12%	315
	Just for fun	3%	315
	I needed an efficient showerhead	3%	75
	Health of family	2%	315
	I needed faucet aerators	0%	75
	Other	0%	315

*Respondents were able to provide multiple responses, and the percentages shown are based on total respondents rather than total responses. Thus, the total of all displayed percentages exceeds 100%.

Although only a few respondents cited specific measures as motivational factors in their decision to participate, initial awareness of specific kit contents may have increased the perceived value of the conservation kits and encouraged customers to enroll. To address this, respondents were then asked about their initial awareness of the conservation kit contents.

[64] As stated on the Companies' program website (www.firstenergycorp.com), "The cost of these kits, along with the costs of all energy efficiency programs, are recovered through residential rates in accordance with Senate Bill 221. No additional costs or handling fees will be charged to customers who request the kits."

As shown in the following table, the majority of respondents reported being aware that the conservation kit contained CFLs, LED night lights, and a smart strip. Slightly more than one-third of respondents indicated that they were aware of the furnace whistle. Finally, only a small percentage of respondents who indicated that they received an all-electric kit were aware that it would contain a showerhead or faucet aerators (13% and 11%, respectively).

Table 6-22: Initial Participant Awareness of Kit Contents

Did you know each of the following would be included in the kit?	***Percentage of Respondents Stating 'Yes'***	***N***
CFLs	71%	314
LED night lights	67%	227
Smart strip	62%	288
Furnace whistle	35%	238
Energy efficient showerhead	13%	75
Faucet aerators	11%	75

Following this, respondents were asked to indicate which single item from the conservation kit was most useful. As shown in the following table, respondents most commonly reported that CFLs were the most useful measure, followed by smart strips and LED night lights. Very few respondents cited furnace whistles, showerheads, or faucet aerators as the most useful measures.

Table 6-23: Usefulness of Individual Conservation Measures

	Measure	**Percent of Respondents**	**N**
What single item from the Energy Conservation Kit was MOST useful to you?	CFL Bulbs	46%	299
	Smart Power Strips	26%	299
	LED Night Lights	26%	299
	Furnace Whistle	2%	299
	Showerhead	1%	68
	Faucet Aerators	0%	68

From these results and the results shown in the above table, it appears that the three measures that the majority of participants expected to receive in the kit are also the measures perceived as the most useful. It is likely that the contents of the kits were a motivational factor for many customers to request a kit, and that these customers knew the value and usefulness of specific measures prior to enrolling in the program.

In order to gain further insight into CFL preferences, respondents were asked which wattage of CFL they found to be most useful. The results were fairly evenly divided among the three given CFL wattages, with 38% of respondents citing the 13-watt CFL, 31% of respondents citing the 26-watt CFL, and 29% of respondents citing the 20-watt CFL as the most useful type. Only three percent of respondents noted that they would have preferred a different wattage of CFL, suggesting that the currently offered varieties are sufficient for the majority of participants.

Prior and Current Energy Efficiency Involvement

The survey included a series of questions related to participants' prior and current familiarity with energy efficiency measures, behaviors, and programs. First, survey respondents were asked whether they had previously installed any of the measures that were included in the conservation kit. The following table shows that the majority of respondents had CFLs previously installed and that 43% of respondents already had smart strips. In contrast, relatively few respondents indicated having LED night lights and faucet aerators previously installed, and only two percent of respondents had furnace whistles prior to participating in the program. This suggests that many participants have prior experience with fairly popular energy efficient measures, but that the Energy Conservation Kit Program provides an introduction to several new energy efficient measures for a majority of participants.

Table 6-24: Prior Installation of Individual Conservation Measures

Measure Type	***Percent of Respondents Indicating Prior Installation***	***N***
CFLs	67%	315
Smart strip	43%	308
Energy efficient showerhead	23%	74
LED night lights	19%	310
Faucet aerators	16%	73
Furnace whistle	2%	306

Respondents were then asked a set of two questions in order to gauge potential effects of the program on participants' knowledge of and familiarity with energy efficiency behaviors and measures. First, respondents were asked to rate their previous familiarity with ways to save energy in their home, before they received the conservation kit. Respondents were then asked to rate their current familiarity with ways to save energy in their home, as a result of receiving the kit. As shown in the following chart, the majority of

respondents reported being somewhat familiar with energy efficient methods prior to participating in the program. The percentage of respondents rating themselves as 'very familiar' with energy saving methods increased from 24% to 49% after receiving the conservation kit.

Approximately 41% of respondents indicated that they have a higher level of familiarity with energy efficiency after receiving the energy conservation kit. Overall, very few respondents reported that they are now only a little familiar, or not at all familiar, with ways to save energy in their home after receiving the kit.

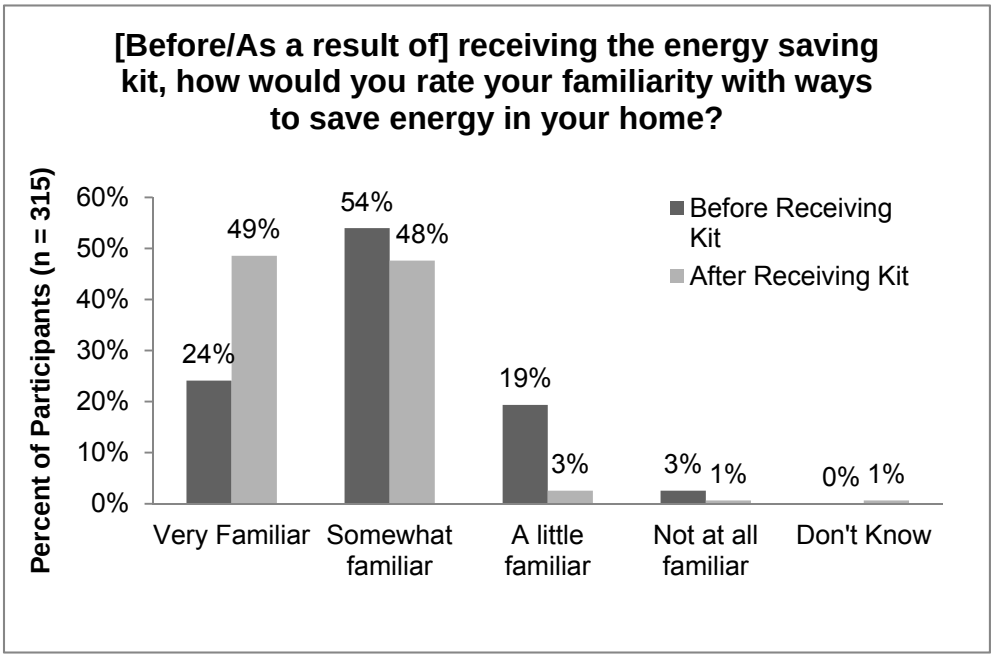


Figure 6-3: Comparative Participant Familiarity with Energy Efficiency

This suggests that in addition to energy savings, the program is providing educational benefits to a substantial portion of the participant group. These participants are likely more equipped to implement additional energy saving behaviors and measures that will further reduce their electrical and gas usage.

Customer Installation of Measures

Participant survey respondents were asked which items in the conservation kit had been installed in their homes. These responses were used to develop the installation rates for the program. The impact evaluation chapter of this report applies these rates to program savings, and the process evaluation provides a brief overview of reported installation trends.

When asked, more than 90% of respondents indicated that they had installed at least one measure from the conservation kit. The remaining respondents were asked why they had not installed any of the measures. Nine of these 17 respondents noted that they had not yet had time to install the measures, while one stated that they did not like any of the measures. The remaining seven respondents provided a variety of other explanations, including already owning the items that were provided and not being physically able to install the items. The following table provides reported installation activity for each measure category.

Table 6-25: Participant Installation of Conservation Measures

Measure	***Percentage of Respondents Reporting Installation****	***N***
CFLs	89%	299
LED Nightlight	87%	299
Smart Strip	58%	299
Showerhead	23%	26
Furnace Whistle	15%	299
Faucet Aerators	15%	27

*For LED night lights, faucet aerators, and CFLs, percentages represent respondents who indicated installing at least one of the items in that measure category.

The survey results indicate that a majority of participants installed their smart strip, at least one LED night light, and at least one CFL. Reported installation activity was substantially lower for energy efficient showerheads, faucet aerators, and furnace whistles. The following provides a summary of surveyed installation findings for each measure category:

- Furnace Whistle: Conversely, only 15% of respondents reported that they had installed the furnace whistle. When asked why they had not installed the furnace whistle, respondents most commonly (25%) indicated that they did not know how to install the item. Fifteen percent of respondents stated that they did not know the purpose of the furnace whistle, and 11% of respondents stated that they did not want their furnace to have a furnace whistle function. The remaining respondents provided a variety of explanations, such as not being aware that they had received a furnace whistle and not yet having time to install the whistle.
- CFLs: Approximately 20% of survey respondents reported that they had installed all of the CFLs from their all-electric or standard conservation kit. When asked why they had not installed some of the CFLs, the remaining respondents most commonly (93%) reported that they are currently storing some CFLs for future use. This suggests that

while a substantial portion of the distributed CFLs are not yet installed, this is likely due to customers waiting for their current bulbs to burn out rather than due to a CFL preference issue. The remaining CFLs may be installed at a later date, generating additional or sustained energy savings.

- Smart Strip: The majority of respondents (58%) indicated that they had installed the smart strip that was provided in the kit. When asked why they had not installed the smart strip, the remaining respondents most commonly indicated that they already have power strips installed in their home, or that they did not need the additional smart strip in general. Very few respondents indicated that they did not understand how to use the smart strip or that they disliked this item.
- LED Night Lights: Approximately 87% of survey respondents indicated that they had installed at least one of the two LED night lights that was included in their all-electric or standard conservation kit. The small percentage of respondents who had not installed either of the night lights were asked what they did with the items; the most common response was that the night lights were still in the conservation kit box. None of the respondents indicated that they had thrown away their LED night lights, and only six respondents reported that they had given the night lights to someone else. In terms of installation location, approximately half of the survey respondents indicated that they had replaced a standard efficiency night light with the new LED night light. The majority of these respondents reported that they had stopped using the standard efficiency night light, either by throwing it away or placing it in storage.
- Energy Efficient Showerheads: Approximately 23% of the respondents who recalled receiving a energy efficient showerhead indicated that they had installed this item. Six respondents provided details regarding the installation location of the showerhead, with all but one reporting that it had been installed in their master bathroom.
- Faucet Aerators: Only approximately 15% of respondents who recalled receiving faucet aerators reported that they had installed at least one of these aerators. Only one respondent explained why they had not installed their aerators, indicating that they did not have any available faucets. When asked about the installation location, respondents most commonly reported installing faucet aerators in their kitchens and bathrooms.

Some participants may continue to install and use their remaining measures over time, either as their current items begins to require replacement or when they have time to replace their existing items. Additionally, participants whose homes have only one bathroom may not have the opportunity to use the second faucet aerator, but may store the additional unit for future use.

Customer Satisfaction

Survey respondents were asked about their levels of satisfaction with each measure they reported installing through the Energy Conservation Kit Program. Results are provided on a 5-point scale of “very satisfied” to “very dissatisfied”. As displayed in the following table, respondents generally reported high satisfaction levels with the majority of measures they had installed.

Energy efficient showerheads, LED night lights, and smart power strips received the highest percentages of ‘very satisfied’ ratings, followed by CFLs. Additionally, none of the respondents provided ratings of ‘dissatisfied’ or ‘very dissatisfied’ for energy efficient showerheads, LED night lights, or faucet aerators.

Table 6-26: Participant Satisfaction with Individual Measures

Measure Type	Satisfaction with Measure Performance and Quality						N
	Very Satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very Dissatisfied	Don't know	
Energy Efficient Showerhead	83%	17%	-	-	-	-	6
LED Night Lights	78%	20%	1%	-	-	-	253
Smart Strip	70%	20%	5%	2%	4%	-	171
CFLs	68%	26%	4%	2%	1%	-	262
Faucet Aerators	57%	29%	-	-	-	14%	7
Furnace Whistle	43%	13%	22%	7%	2%	13%	46

Respondents were then asked to rate their satisfaction with the program itself. Specifically, respondents indicated their level of satisfaction with the time it took to receive the conservation kit, and with their overall program experience. Results are provided on a 5-point scale of “very satisfied” to “very dissatisfied”. As shown in the following table, none of the respondents indicated dissatisfaction with the time it took to receive the kit, and the majority of respondents reported being very satisfied with this aspect of the program.

Similarly, more than 90% of respondents indicated that they were either satisfied or very satisfied with their overall program experience. Only seven (2%) of all survey respondents indicated dissatisfaction with this element. When asked to provide more information regarding their satisfaction rating, three of these respondents explained that they disliked the fact that residential utility customers are required to pay for energy efficiency programs.

Table 6-27: Participant Satisfaction with Program Experience

Program Element	Satisfaction with Measure Performance and Quality						N
	Very Satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very Dissatisfied	Don't know	
Time taken to receive conservation kit	51%	34%	13%	-	-	2%	255
Overall program experience	70%	23%	4%	1%	1%	1%	312

These responses as a whole suggest that participants are on average highly satisfied with the individual measures they received and their experiences with the Energy Conservation Kit Program.

Program Staff Interview Findings

This section summarizes the findings from the Companies program staff interview. An interview was conducted with the Energy Conservation Kit Program manager in order to gain insight into the design, structure, and operation of the program, and to identify any existing issues within these areas or planned program changes. Specifically, the interview focused on program management activities such as marketing and planning efforts, the overall effectiveness of the program, and the identification of areas for future program improvement.

Key program features and trends addressed through the program staff interview include:

- Program Performance: Program staff noted that the Energy Conservation Kit Program exceeded its 2013 program year goals by more than 100%. Program staff explained that Power Direct has a close working relationship with the measure supplier and was able to increase the supply of measures in order to meet the higher than expected participation demands. Program staff did not identify any significant issues with program staffing resources, budget, or participation potential for 2014 and 2015.

- Direct Program Marketing Activity: The Energy Conservation Kit Program was initially marketed via direct mail to customers and followed up with an e-mail. Several promotional flyers were distributed to customers during the summer months, directing customers to visit the program website or to call the toll-free enrollment telephone number.[65] This was followed by an outbound telephone call effort, which was

[65] A sample program marketing flyer is included as an appendix in this report for reference purposes.

conducted by a Power Direct subcontractor. Program staff noted that these outbound telephone calls resulted in a 60% program acceptance rate.

- Program Awareness Growth: Program staff reported that word of mouth has been an effective form of indirect marketing for the program, as participating customers have encouraged their friends, family members, and colleagues to enroll. The program has also been mentioned in several energy efficiency blogs and other forms of social media, for its no-additional-cost enrollment and high quality of measures. This suggests that program awareness has increased dramatically during 2013, and that the 2014 program year will experience continued growth in participation interest.

- Program Operation Effectiveness: The Companies program manager noted that they communicate with Power Direct nearly every day, with topics ranging from program participation status updates to planned program changes. According to the Companies' program staff, Power Direct has actively responded to requests and has adeptly performed its program responsibilities. It appears that the communication channel between the two entities is effective, and that the existing working relationship provides sufficient staffing resources to operate and manage the program.

- Customer Requests: The program manager noted that some customers contact the Companies or Power Direct with suggestions or requests for additional energy conservation measures. The most commonly mentioned item is LED lighting in addition to the currently-included LED nightlights. Although some customers prefer LEDs to CFLs and may be more likely to install LEDs, LEDs other than the currently included night lights are a higher-cost measure. The educational materials provided within the kits, such as the "More than 100 Ways to Improve your Electric Bill" brochure, do include information encouraging customers to purchase and install LED lighting, which may motivate some participants to pursue this option.

6.2.2 Schools Kits

This section presents key findings from surveys conducted with customers who participated in the 2013 School Kit Program provided by the Companies. ADM conducted online and telephone surveys with program participants as part of the evaluation effort for the 2013 School Kit Program. This survey effort was designed to gather information regarding the participant perspective on program operations and delivery, specifically addressing participant satisfaction with individual program elements and measures. Data collected via participant surveying are used in evaluating:

- Customer awareness of the program;
- Customer implementation of energy efficient equipment;

- Customer decision making; and
- Customer satisfaction with the program.

ADM administered an online survey, and a telephone survey for participants whose email addresses were not listed in the program tracking data. All survey instruments were identical, and results were combined for the purpose of process evaluation and impact analysis. In total, 161 participants responded to the telephone and online surveys.

Household Characteristics

The majority of respondents indicated that they have a non-electric water heater. These customers would not generate electric savings through the use of the included faucet aerator, although this issue was considered during the program design process. This distribution varies somewhat from locations but is roughly consistent with the Companies estimate of 15% electric water heater representation and 85% non-electric water heater representation.

Table 6-28: Participant Water Heating Type

Water Heating Type	***Percent of Respondents (n = 161)***
Electric	30%
Non-electric	70%

Respondents also indicated the number of residents who currently live in their household. The average number of residents in participant homes was approximately 4.3 people, with few respondents indicating that fewer than three people live in their home. This is expected, as the Schools Kit Program targets households with one or more elementary school children.

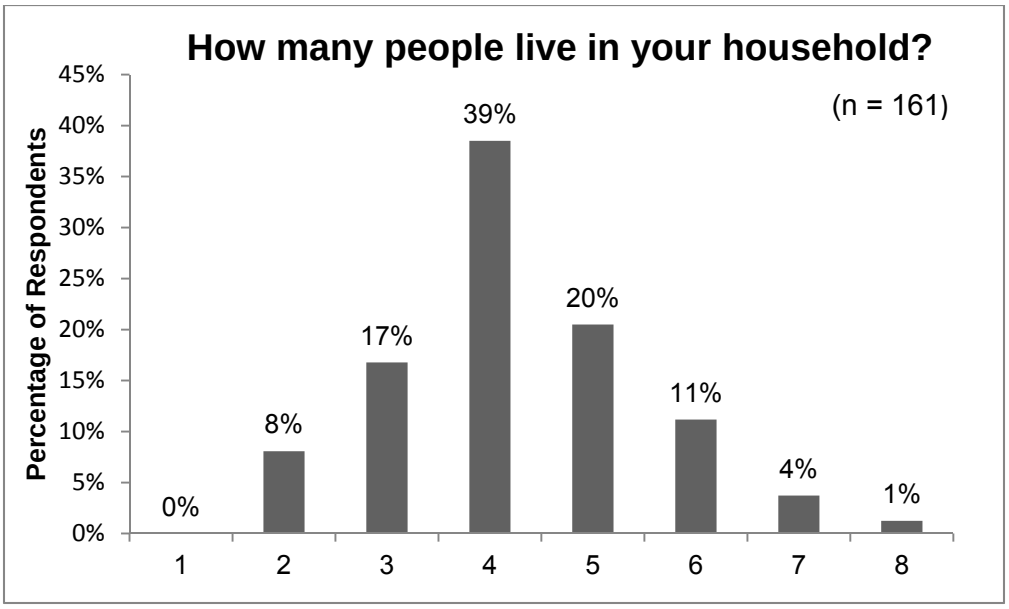


Figure 6-4: Participant Household Population

Customer Awareness of Program

Survey respondents were asked to identify how they first learned of the School Kit Program. As shown in the following figure, nearly all of the respondents cited a program at their child's school, with only a few respondents indicating learning about the program through other sources. This is consistent with the program's marketing strategy and implementation methodology of providing in-school energy education and program promotion towards students.

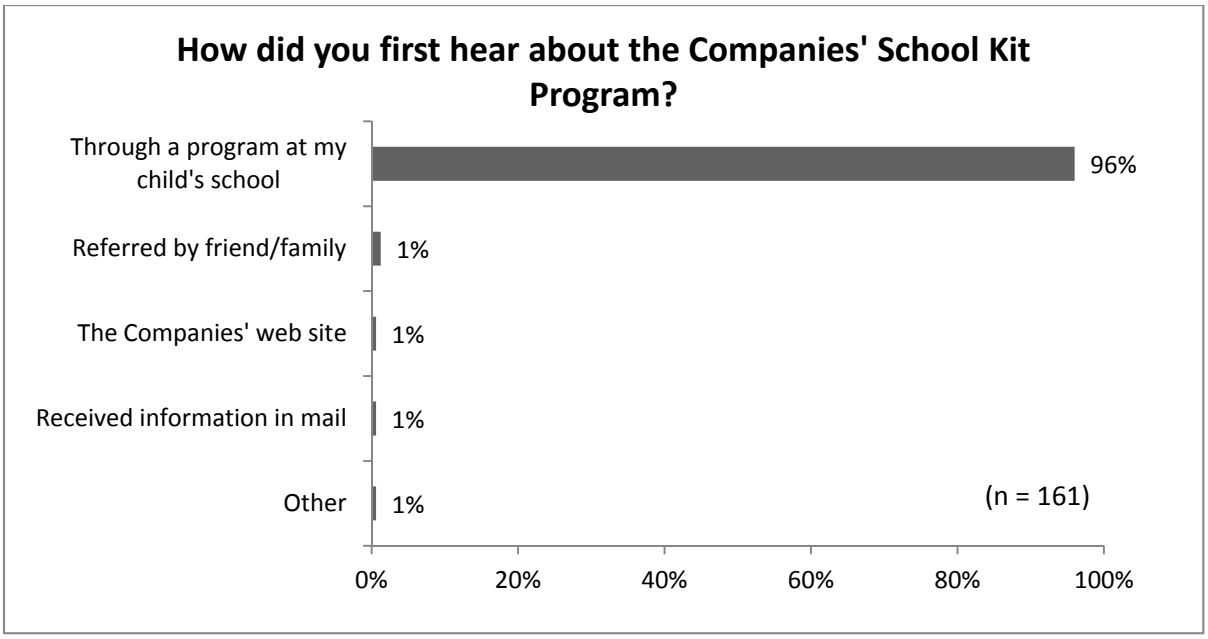


Figure 6-5: How Participants Learned about the Program

Participant Motivations and Preferences

Respondents were then asked a series of questions related to their decision making and prior experience with energy efficiency. As displayed in the following table, 40% of respondents indicated that they chose to participate in the program because the kit was free, or provided at no additional cost. Additionally, 37% of respondents stated that they requested a kit because it appeared to be useful and valuable, and 28% of respondents stated that they were looking for ways to save energy in their home. The popularity of these three responses suggests that participants primarily enrolled in the program to receive the tangible and financial benefits of receiving and installing the conservation measures.

Twenty-two percent of respondents provided open-ended commentary indicating that they enrolled in the program because of their child's request; this was converted from a response of 'other' to a categorized response below. This suggests that many students are interested in and excited about energy efficiency, and that they are effectively communicating this to their parents.

Although respondents cited the kit's value as a significant motivational factor in their participation, very few respondents reported participating due to specific measures such as light bulbs or faucet aerators.

Table 6-29: Factors Motivating Participation

	Response	Percent of Respondents* (n = 160)
What factors motivated you to request an Energy Conservation Kit from the Companies?	It was free[66]	40%
	The kit looked useful and valuable	37%
	I was looking for ways to save energy in my home	28%
	My child asked me to request the kit	22%
	Just for fun	17%
	Environmental reasons	16%
	Other	9%
	I needed light bulbs	7%
	Health of family	7%
	Recommendation from a friend	6%
	I needed faucet aerators	0%

*Respondents were able to provide multiple responses, and the percentages shown are based on total respondents rather than total responses. Thus, the total of all displayed percentages exceeds 100%.

Although only a few respondents cited specific measures as motivational factors in their decision to participate, initial awareness of specific kit contents may have increased the perceived value of the conservation kits and encouraged customers to enroll. To address this, respondents were then asked about their initial awareness of the student kit contents.

As shown in the following table, responses were fairly evenly split among the four measure types, although respondents most commonly reported being aware that the conservation kit contained CFLs. Thirty-eight percent of respondents indicated that they were initially aware of the LED night lights, and 31% indicated that they were initially aware of the faucet aerators. These results suggest that while CFLs may have been a motivating factor for many participants, the majority of participants likely did not know the full set of measures that they would receive through the School Kit Program.

[66] As stated on the Companies' website (www.firstenergycorp.com), "The cost of these kits, along with the costs of all energy efficiency programs, are recovered through residential rates in accordance with Senate Bill 221. No additional costs or handling fees will be charged to customers who request the kits."

Table 6-30: Initial Participant Awareness of Kit Contents

Did you know each of the following would be included in the kit?	***Percentage of Respondents Stating 'Yes'***	***N***
Three 13-Watt CFLs	46%	48
One 18-Watt CFL	42%	48
One LED night light	38%	47
Two faucet aerators	31%	48

Following this, respondents were asked to indicate which single item from the student kit was most useful. As shown in the following table, results were fairly evenly split between CFLs (49% of respondents) and LED Night lights (45% of respondents). Few respondents indicated that the faucet aerators were the most useful measure.

Table 6-31: Usefulness of Individual Conservation Measures

	Response	***Percent of Respondents (n=154)***
What single item from the Energy Conservation Kit was MOST useful to you?	CFL Bulbs	49%
	Night Lights	45%
	Faucet Aerators	6%

In order to gain further insight into CFL preferences, respondents were asked which wattage of CFL they found to be most useful. The 13-Watt CFL was the most popular response, cited by 60% of respondents. Thirty-seven percent of respondents cited the 18-Watt CFL as the more useful bulb, and two percent of respondents indicated that they would have preferred a different wattage of CFL, suggesting that the currently offered varieties are sufficient for the majority of participants.

Prior and Current Energy Efficiency Involvement

The survey included a series of questions related to participants' prior and current familiarity with energy efficiency measures, behaviors, and programs. First, survey respondents were asked whether they had previously installed any of the measures that were included in the student kit. The following table shows that the majority of respondents had previously installed CFLs. Additionally, 30% of respondents had LED night lights previously installed, and one-quarter of respondents already had faucet aerators installed in their home.

Although the majority of respondents have previous experience with CFLs, it appears that the School Kit Program provides an introduction to LED night lights and faucet aerators for a majority of participants.

Table 6-32: Prior Installation of Individual Conservation Measures

Measure Type	***Percent of Respondents Indicating Prior Installation***	***N***
CFLs	63%	161
LED Night Lights	30%	159
Faucet aerators	25%	161

Respondents were then asked a set of two questions in order to gauge potential effects of the program on participants' knowledge of and familiarity with energy efficiency behaviors and measures. First, respondents were asked to rate their previous familiarity with ways to save energy in their home, before they received the school kit. Respondents were then asked to rate their current familiarity with ways to save energy in their home, as a result of receiving the kit. As shown in the following figure, participants most commonly reported being somewhat familiar with energy efficient methods prior to participating in the program. The percentage of respondents rating themselves as 'very familiar' with energy saving methods increased from 21% to 51% after receiving the conservation kit.

Additionally, approximately one-third of respondents indicated that they have a higher level of familiarity with energy efficiency after receiving the energy conservation kit. Only five percent of respondents reported that they are now only a little familiar, or not at all familiar, with ways to save energy in their home after receiving the kit.

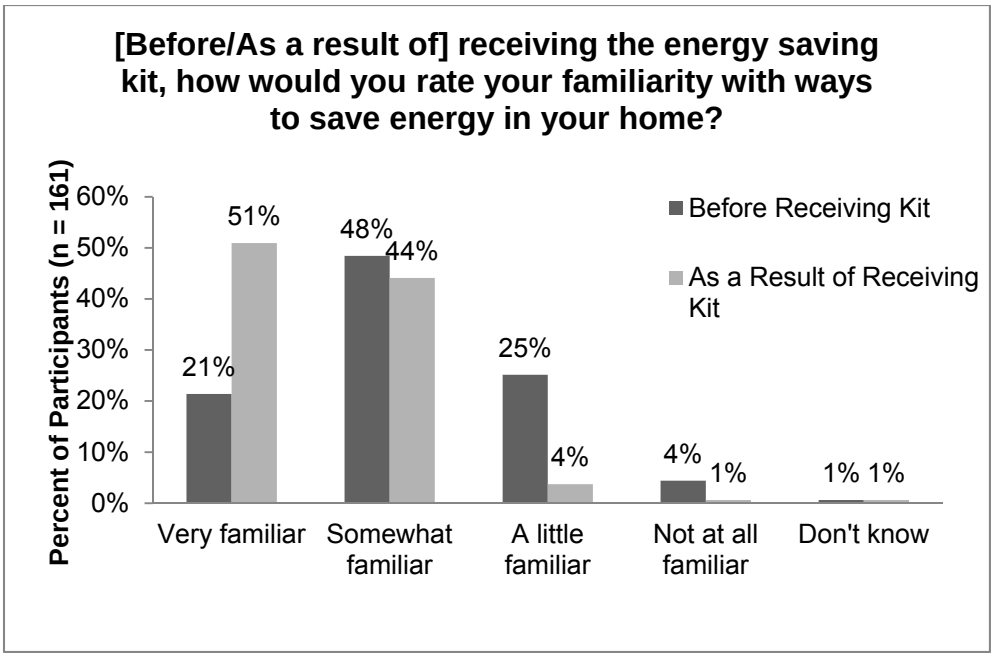


Figure 6-6: Comparative Participant Familiarity with Energy Efficiency

Customer Installation of Measures

Participant survey respondents were asked which items in the school kit had been installed in their homes. These responses were used to develop the installation rates for the program. The impact evaluation chapter of this report applies these rates to program savings, and the process evaluation provides a brief overview of reported installation trends.

When asked, nearly all (96%) of the respondents indicated that they had installed at least one measure from the kit. The remaining seven respondents were asked why they had not installed any of the measures. Three of these respondents indicated that they had not yet had time to install the measures. Another two respondents indicated that they already had the kit measures or were waiting for their current bulbs to burn out before installing the CFLs. Only one respondent stated that they disliked all of the measures that were provided.

The following table provides reported installation activity for each measure category.

Table 6-33: Participant Installation of Conservation Measures

Measure	*Percentage of Respondents Reporting Installation**	*N*
LED Night Light	95%	154
CFLs	93%	161
Faucet Aerators	44%	153

*For CFLs and faucet aerators, percentages represent respondents who indicated installing at least one of the items in that measure category.

The survey results indicate that a majority of participants installed at least one of the CFLs and the LED night light. Reported installation activity was substantially lower for faucet aerators, with only 44% of respondents reporting installation. The following provides a summary of surveyed installation findings for each measure category:

- CFLs: Approximately 47% of survey respondents reported that they had installed both of the CFLs from their kit. Respondents who had not installed either CFL were asked why they had not installed the measures, and nine (75%) of these respondents explained that they are waiting for their current bulbs to burn out. Additionally, nearly all of the respondents who had only installed one of the CFLs reported that they are currently storing them for future use. These results suggest that the remaining CFLs may be installed at a later date, generating additional or sustained energy savings.

- LED Night Lights: Approximately 95% of survey respondents indicated that they had installed the LED night light that was included in their kit. The small percentage of respondents who had not installed the night light were asked what they did with the item; all of these respondents stated that the night light was still in the kit box. In terms of installation location, approximately half (52%) of the survey respondents who installed the night light indicated that they had replaced a standard efficiency night light with the new LED night light. The majority (61%) of these respondents reported that they had placed the standard efficiency nightlight in storage for later use.

- Faucet Aerators: Approximately 44% of respondents who recalled receiving faucet aerators reported that they had installed at least one of these aerators. The respondents who had only installed one of the faucet aerators mainly stated that they already have faucet aerators installed in their other faucets. Additionally, two respondents indicated that they did not know how to install the faucet aerators. When

asked about the installation location, nearly all respondents reported that they installed the faucet aerator(s) in their kitchens and bathrooms.

Overall, installation rates appeared fairly high for the kit measures. Many respondents indicated that they may install the additional measures at a later date, suggesting that the kit measures may generate additional savings over time. There were very few instances of respondents indicating that they definitely would not install the measure(s) in the future.

Customer Satisfaction

Survey respondents were asked about their levels of satisfaction with each measure they reported installing through the School Kit Program. Results are provided on a 5-point scale of "very satisfied" to "very dissatisfied". As displayed in the following table, respondents reported very high satisfaction levels with each measure category.

LED night lights received the highest satisfaction ratings, with 98% of respondents indicating that they were satisfied or very satisfied with this measure. In total, only between one and four percent of respondents indicated a level of dissatisfaction with any individual measure category.

Table 6-34: Participant Satisfaction with Individual Measures

Measure Type	Satisfaction with Measure Performance and Quality						N
	Very Satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very Dissatisfied	Don't know	
LED Night Lights	76%	22%	1%	1%	-	-	144
CFLs	65%	30%	2%	-	2%	-	142
Faucet Aerators	54%	33%	7%	4%	-	1%	67

Overall, surveyed respondents indicated high levels of satisfaction with individual measures, and instances of dissatisfaction were very infrequent. It appears that the majority of dissatisfaction was related to participant preferences rather than inherent measure quality. Thus, these results do not indicate any substantial issues with program delivery or individual measures.

Respondents were then asked to rate their satisfaction with the program itself. Specifically, respondents indicated their level of satisfaction with the time it took to receive the conservation kit, the process required to request the kit, and their overall program experience. Results are provided on a 5-point scale of "very satisfied" to "very dissatisfied". As shown in the following table, none of the respondents indicated that they

were ‘very dissatisfied’ with any of the program elements and ratings of ‘dissatisfied’ were infrequent.

Satisfaction ratings were very high for each of these factors, especially the kit request process and participants’ overall program experience. Most of the respondents who indicated dissatisfaction with one of these elements did not elaborate on the rating.

Table 6-35: Participant Satisfaction with Program Experience

Program Element	Satisfaction with Measure Performance and Quality						N
	Very Satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Very Dissatisfied	Don't know	
Time taken to receive conservation kit	54%	34%	8%	2%	-	1%	160
Process used to request the kit	74%	22%	2%	1%	-	1%	161
Overall program experience	73%	25%	1%	1%	-	-	160

These responses as a whole suggest that participants are on average highly satisfied with the individual measures they received and their experiences with the School Kit Program.

Program Staff Interview Findings

This section summarizes the findings from the Companies program staff interview. An interview was conducted with the School Kit Program manager in order to gain insight into the design, structure, and operation of the program, and to identify any existing issues within these areas or planned program changes. Specifically, the interview focused on program management activities such as marketing and planning efforts, the overall effectiveness of the program, and the identification of areas for future program improvement.

Key program features and trends addressed through the program staff interview include:

- Initial Program Design: During initial program design, the kits distribution goal was set to approximately 56,000 kits total. This preliminary design did not include the NTC live performances and focused on kit distribution and measure installation rather than energy efficiency education. Program staff noted that this version of the program was more costly than expected, and that it would have been difficult to meet these initial

goals. The decision to partner with NTC allowed the Companies to reduce kit distribution goals and shift the program towards a more educational focus, which has likely contributed to the program's positive reception and effective performance levels thus far.

- Program Performance: As 2013 was the pilot year, there were no kit distribution or savings goals. However, as the program pilot was successful, the Companies plan to continue implementing the School Kits Program throughout the 2013 to 2015 program cycle.
- Program Promotion and Education: Program management staff discussed the program marketing strategy, noting that educators within targeted schools serve as an important source of program promotion and energy efficiency awareness. Two weeks prior to the performance, teachers receive informational materials regarding program details and energy efficiency topics so that they can encourage their students to request a conservation kit. These materials include curriculum guidelines and other educational supplies for the teacher to use prior to and following the theater performance. Teachers have an incentive to apply these materials in the classroom, as collecting kit enrollment cards makes them eligible to receive one of three cash prizes through an NTC drawing. The Companies program staff noted that teacher reception of the program has been highly positive thus far.
- Program Awareness and Adoption: Program staff noted that while reception to the program has been positive, only approximately 20-25% of students' parents requested a kit during 2013. Thus, there remains an opportunity to increase program awareness and generate additional kit enrollment within the currently participating schools. The specific barriers to participation are unclear, although it is likely that some students who receive a permission slip do not deliver it to their parents, and that some parents do not understand that the kit is provided at no additional cost.

6.3 New Homes

This section provides a summary of findings organized by topics of interest from the New Homes process evaluation.

Tetra Tech, working in conjunction with ADM, conducted in-depth interviews with staff from the Companies, PSD, raters, and builders (both active and inactive in program participation). Interviews were conducted between February 7, 2014 and March 4, 2014. ADM provided Tetra Tech with the contact information. Tetra Tech spoke with the Companies program lead, four PSD staff, eight builders, and eight raters. Of the eight builders, two had signed up for the program but had not actively participated in 2013. In

total, Tetra Tech conducted 21 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

Companies Program Staff Administration, Oversight and Communication

The program oversight has remained the same through the program years. The Companies contracted with PSD to administer the Energy Efficient New Homes program. Among the PSD program team are the program coordinator, a QA manager, on-site QA inspector, 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. There are a couple administrative staff who work with this program. One person is responsible for reviewing the QA inspection forms once completed by the inspectors. If corrections are needed, the QA inspection form is passed to the QA manager for further action. The second 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 handles the completion and submission of W9 forms that are required for all builders receiving a rebate.

For actual implementation, the builders typically communicate directly with their rater, and the raters communicate directly with PSD. Four of the eight builders said they rely on their rater for program information, paperwork submission, and to ensure program requirements are met.

Raters work with PSD to submit the paperwork in order for builders to receive the program incentives. The six out of the eight raters who have participated in the program said they

find the online submission process easy to complete. The only complaint was in regards to entering submissions for multifamily buildings. Currently, submissions are required for each unit of the building. Raters would like to see the address and some other whole building information retained for entry across the units rather than having to retype the same information for as many units completed.

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

Effectiveness of Program Marketing

Marketing efforts are performed by PSD staff and participating raters. The initial sign-up materials have not changed from last year. 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
- 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.

Builders were asked if there were any kinds of marketing they would like to see or use to help promote the program. Two builders mentioned they would like to have some sort of case study handout showing the difference between a standard code home and an ENERGY STAR home, and what the cost savings are. This may help to convince buyers why they should spend more money up front and how it will be recovered. Another said the Companies should market the durability of ENERGY STAR homes, not just the cost savings. Show that the homes are built to last longer than a standard code home. Doing

more television and radio ads were also mentioned to bring more awareness to the program.

Builders are not discussing the program amongst each other, as becoming an ENERGY STAR builder is a competitive marketing tool for them.

Overall, 42 of the 62 homeowners said they were aware their home was built under the Companies' New Homes program prior to the survey (18 of 30 in Ohio Edison, 23 of 30 in Cleveland Electric, and 1 of 2 in Toledo Edison). Of those aware, 28 of the 42 learned about the program from homebuilder staff (14 of 28 in Ohio Edison and 14 of 28 in Cleveland Electric). One homeowner each from Ohio Edison and Cleveland Electric learned about the program from a private party (e.g., friend, family member, neighbor, etc.). The other six did not recall where they heard about the program.

Program Design and Delivery

Eligible homes received a rebate of $400, plus $0.10/kWh saved over a reference home, as calculated by the modeling software, REM/Rate. To receive the incentive, all construction and installation requirements of the program must be met, including being 15 percent more efficient than the 2009 IECC standards and receive ENERGY STAR certification.

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. All seven of the raters we spoke with said they actively promote the program to builders.

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—8 percent will receive a full comprehensive review with a blower-door test and other mechanisms, and 2 percent consist of only a visual review, ensuring

the correct number of bulbs is installed, the right equipment models are reported, etc. There were no issues reported by builders or raters regarding the onsite QA process.

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.

Process and Decision Making

Questions were asked to determine the level of involvement the builder and realtor had on the homebuyer's decision regarding the type of equipment installed in the house, along with the receipt of any energy efficiency education of the home.

Of the customers who own their home, the construction of the home was almost equally split between being designed by a builder or being a pre-built or spec home—13 of 24 respondents in Ohio Edison and 13 of 27 in Cleveland Electric worked with the builder while 11 in Ohio Edison and 13 in Cleveland Electric said the home was pre-built/spec). Respondents who worked with a builder were asked if the builder discussed ways to increase the energy efficiency of the home with them. As indicated by respondents, approximately 54 percent of builders had this discussion with the homebuyer. For the 19 customers who worked with a realtor who mentioned the energy efficient features of the home, 100 percent of homeowners said the discussion influenced their decision to buy the home. Working with realtors may be a way to increase the awareness of the program and of energy efficiency in the home.

Appliance and Home Characteristics

Twenty-four of the 29 Ohio Edison homeowners reported owning their home, while 3 of the 30 Cleveland Electric respondents indicated they rent. The two Toledo Edison homeowners who completed the survey indicated they rent.

Gas and electric were the two main types of water heaters amongst respondents (28 and 27 respondents, respectively). There were three respondents who made up the others—tankless water heater, geothermal, and solar tankless water heater.

Homeowners were asked if each type of equipment was ENERGY STAR rated. Forty-seven out of 50 refrigerators installed in the new homes were ENERGY STAR rated. Forty-five out of 51 clothes washers were ENERGY STAR rated and 41 out of 45 dishwashers were as well. The counts for homeowners who indicated that their

equipment was ENERGY STAR rated and the survey sample size, indicated as *N*, are shown in Table 6-36.

Table 6-36: Counts of ENERGY STAR Rated Equipment

Operating Company	OE		CEI		TE		Overall	
	Yes	N	Yes	N	Yes	N	Yes	N
Refrigerator	21	23	25	25	2	2	47	50
Clothes washer	20	24	24	26	1	1	45	51
Dishwasher	19	20	20	24	1	1	41	45

Current and Future Challenges

Program clarity was not reported as a problem this year. When asked if there was anything about the program that was unclear to them, none of the builders said they had any issues understanding the requirements. This was also the case for the raters.

It is still believed by the builders and raters we spoke to that the perception of homebuyers 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.

A challenge reported by two builders this evaluation year was finding HVAC contractors that were ENERGY STAR certified. One builder said they did not have a certified contractor in a three-county area, likely because there is not a lot of new construction in their area. This has made it difficult to get someone to come out to their project sites to complete the work. They have considered paying for a local contractor to become certified just to eliminate this issue.

Two raters mentioned the issue of needing certified HVAC contractors for the program as well. This is not just an issue for the builders needing to hire a certified HVAC contractor but also for the contractors themselves, since they have to pay to be recertified every year. It is an added expense for both parties.

All eight builders said they plan for 100 percent of their new homes built in 2014 to be program qualifying. One builder said they wanted to continue to take advantage of the rebates while they can and, although they worry about the cost of doing so, they feel that ENERGY STAR 3.0 will be the requirement in a couple years anyway, so they feel it is

worth it to build to that standard now and receive the incentives. None of the builders expressed any concerns with the ability to build to ENERGY STAR 3.0 standards.

Program Satisfaction

Program satisfaction remains high among participating builders and raters. Both raters and builders appreciate the marketing opportunity it provides for selling their services and homes. Builders are satisfied because they are able to build better quality homes, market the energy efficiency of the home, and receive the incentives. Table 6-38 summarizes the findings of the participant satisfaction survey for both builders and raters.

Table 6-37: Participant Satisfaction with Program Experience

Program Element	***Satisfaction with Measure Performance and Quality***						***N***
	Very Satisfied	***Satisfied***	***Neither satisfied nor dissatisfied***	***Dissatisfied***	***Very Dissatisfied***	***Don't know***	
Builder overall program satisfaction	50%	50%	-	-	-	-	8
Rater overall program satisfaction	33%	33%	33%	-	-	-	6

While not asked about overall satisfaction with the program, customers were asked their satisfaction with the performance and quality of the equipment installed in their home. Satisfaction is high with the majority of customers reporting being either very satisfied or somewhat satisfied. Satisfaction counts for performance and quality of equipment is show in

.

Table 6-38: Satisfaction Counts for Performance and Quality of Equipment

Operating Company	OE		CEI		TE		Overall	
	Satisfied*	n	Satisfied*	n	Satisfied*	n	Satisfied*	n
Refrigerator	25	30	25	29	2	2	52	61
Clothes washer	17	29	26	30	2	2	45	61
Clothes dryer	22	29	26	30	2	2	50	61
Dishwasher	17	29	20	30	1	2	38	61
CFLs	19	30	20	30	2	2	41	62

*Very or somewhat satisfied

6.4 Behavioral

This section reports findings from the process evaluation of the BMod Program. Findings are based on survey responses from samples of customers who participated in the BMod program during 2013. The findings also draw on survey responses from nonparticipants. There were over 80 responses for both the participant and non-participant groups. This chapter presents findings from the participant surveys that address several research questions.

- How did customers learn of the availability of the HERs?
- What actions did report recipients take to save energy? How did these actions differ from the energy saving actions of online audit users or a control group?

Characteristics of Dwellings for 2013 Behavioral Management Program Participants

As background for the process evaluation, tabulations were prepared to compare the characteristics of the dwellings of participants in the 2013 BMod program to those of non-participants. These comparisons are provided in Table 6-39, Table 6-40, Table 6-41, and Table 6-42.

Table 6-39: Type of Dwelling Occupied by 2013 BMod Program Participants

Type of Dwelling	Participants	Non-Participants
Single-family home, detached construction	81.5%	82.7%
Single-family home, factory manufactured/modular	2.5%	1.9%
Mobile home	1.2%	3.9%
Row house	2.5%	0.0%
Two or Three family attached residence	3.7%	1.9%
Apartment with 4+ families	2.5%	5.8%
Condominium	3.7%	3.9%
Other	2.5%	0.0%
Totals	100%	100%
Sample sizes	n = 81	n =72

Table 6-40: Distribution of Owner/Renter for 2013 OA Program Participants

Owned or Rented?	Participants	Non-Participant
Owned	91.4%	75.0%
Rented	8.6%	25.0%
Did not know	0.0%	0.0%
Did not answer	0.0%	0.0%
Totals	100%	100%
Sample sizes	n = 81	n =72

Table 6-41: Year Built for Dwellings Occupied by 2013 OA Program Participants

Year Dwelling Was Built	Participants	Non-Participants
Before 1960	24.7%	30.8%
1960-1969	11.1%	5.8%
1970-1979	23.5%	28.9%
1980-1989	13.6%	7.7%
1990-1999	9.9%	5.8%
2000-2005	4.9%	7.7%
2006 or Later	4.9%	5.8%
Did not know	7.4%	7.7%
Totals	100%	100%
Sample sizes	n = 81	n =72

Table 6-42: Size of Dwelling Occupied by 2013 BMod Program Participants (As Measured by Square Feet of Above-Ground Living Space)

Year Dwelling Was Built	Participants	Non-Participants
Less than 1,000 square feet	6.2%	11.5%
1,000-2,000 square feet	40.7%	42.3%
2,000-3,000 square feet	28.4%	32.7%
3,000-4,000 square feet	13.6%	1.9%
4,000-5,000 square feet	1.2%	1.9%
More than 5,000 square feet	0.0%	1.9%
Don't know	9.9%	7.7%
Totals	100%	100%
Sample sizes	n = 81	n =72

Customers' Experience in Receiving Home Energy Reports through 2013 BMod Program

Approximately 90% of program participants surveyed indicated that they recalled receiving the HERs.

Table 6-43 details how customers rated the helpfulness of the information they were sent.

Table 6-43: How helpful were the HERs

Would you say the information contained in the HERs was helpful?	Percentage of Customers
Very helpful	44.4%
Somewhat helpful	34.6%
Unhelpful	17.3%
Don't Know / Don't recall	3.7%
Totals	100%
Sample size	n = 81

Table 6-44 shows the percentages of participants in the 2013 BMod program who reported making energy saving changes after receiving the report. Customers were more likely to report making structural changes than taking behavioral actions.

Table 6-44: Percentages of Participants in 2013 BMod Program Taking Different Types of Energy Saving Actions

Type of Energy Saving Action	***Percentage of Customers***
Structural (Equipment)	40.7%
Behavioral	28.4%
Both Structural & Behavioral	28.4%
No Changes Made	24.7%
Did not know / did not recall	1.2%
Sample Sizes	n=81

Table 6-45 shows how participants rated their satisfaction with the information provided to them in HERs.

Table 6-45: How Participants Rated Their Satisfaction with HERs

Level of Satisfaction	***Telephone Audit***
Very satisfied	42.0%
Somewhat satisfied	39.5%
Neither satisfied nor dissatisfied	9.9%
Somewhat dissatisfied	2.5%
Very dissatisfied	3.7%
Did not know	2.5%
Sample Sizes	n=81

Actions Taken by BMod Participants as Compared to Non-Participants

A survey of non-participants provided information on actions they took to save energy during hot or cold weather. Table 6-46 shows how BMod participants compared to non-participants on taking actions to save energy.

Table 6-46: Percentages of Customers Who Reported Taking Particular Actions to Save Energy in Response to Hot or Cold Weather

	Participants	***Non-Participants***
Percentage doing particular things to save energy in hot weather	61.0%	36.5%
Percentage doing did particular things to save energy in cold weather	70.7%	51.9%
Sample sizes	n=81	n=72

7. Conclusions and Recommendations

This chapter reports the conclusions and recommendations resulting from the impact and process evaluation of the 2013 Program.

7.1 Audits

7.1.1 Comprehensive Home Audit

Energy Impacts

The overall evaluation results for estimated gross kWh energy savings and kW peak demand reductions for the CHA subprogram in 2013 in the Companies' service territories are summarized in Table 7-1.

Table 7-1: Ex Ante and Ex Post Gross kWh and kW by Operating Company

Operating Company	Ex Ante Expected Gross Savings		Ex Post Verified Gross Savings	
	Gross kWh	Gross kW	Gross kWh	Gross kW
CEI	437,000	86.54	404,782	96.85
OE	581,021	163.12	452,438	117.73
TE	229,128	42.25	148,960	37.41
All Companies	1,247,149	291.91	1,006,179	251.99

The gross kWh savings totals shown in Table 7-1 give a realization rate for kWh savings of about 81%, as determined by the ratio of verified gross kWh savings to expected gross kWh savings. The realization rate for kW reductions was about 86%.

Of the total kWh savings, 63% resulted from direct install measures and 37% from rebate measures. Direct install measures accounted for 30% of kW demand reductions and rebate measures for 70%.

Taken together, the various types of CFLs directly installed through the program accounted for 61% of the total kWh savings, ENERGY STAR windows for 30%, and all other measures for the remaining 9%.

Process Findings

Program staff relied on contractors to successfully market the program. When active and less active contractors were asked how customers heard about the program, they indicated that customers primarily heard about the program through contractors' efforts. Program success has been linked to contractor involvement. Contractors continue to act

as the program's sales force. Maintaining a high level of contractor customer service is important in maintaining and growing the contractor sales force and achieving program goals.

Recommendations

Program staff members should continue to remain engaged with contractors to maintain the robust network that has been built. While contractors are eager to participate in the program, active and less active contractors expressed frustration with the time it takes for customer rebates to be processed and difficulty tracking rebate status.

7.1.2 Online Audits

Energy Impacts

A total of 15,157 customers participated in the OA program in Ohio in 2013. Of these participants, about three-fourths used the online audit method and about a fourth used the telephone audit method. This concluding section of the report summarizes ADM's answers to each of the impact and process evaluation questions that guided our efforts in the evaluation of the 2013 OA Program. We turn first to a summary of the major impact evaluation findings.

Electricity and Demand Savings

For all home energy audits combined in 2013, e*x ante* expected annual kWh savings were 4,094,032 kWh. The *ex post* verified annual electricity savings for all home energy audits combined in 2013 were 6,254,007 kWh. The ratio of ex post to ex ante total electricity savings yields an overall realization rate of about 152 percent for kWh savings for the 2013 OA program.

For all home energy audits combined in 2013, *ex ante* expected critical peak demand kW reduction was 1,222 kW. The *ex post* verified critical peak kW reduction for all home energy audits combined in 2013 was 2,697.3 kW. The ratio of ex post to ex ante total demand reductions yields an overall realization rate of about 221 percent for kW reductions for the 2013 OA program.

Table 7-2 shows program-level results for kWh savings and kW reductions for the 2013 OA program for each of the Ohio Companies.

Audit Methods Contributions to Electricity Savings

Of the total electricity savings, 3,657,931 kWh (58 percent) were from online audits and 2,596,076 kWh (42 percent) were from telephone audits.

Of the total demand reduction, 1218.8 kW (45 Percent) were from online audits and 1478.5 kW (55 Percent) were from telephone audits.

Table 7-2: Program-Level Savings (kWh) and kW Reductions by Utility and Audit Method

CEI			
	Telephone	***Online***	***All Audits***
Total kWh Saved	779,621	1,179,678	1,959,299
Total kW Reduced	526.9	380.1	907.1
OE			
	Telephone	***Online***	***All Audits***
Total kWh Saved	1,455,223	1,983,064	3,438,287
Total kW Reduced	717.4	603.3	1320.7
TE			
	Telephone	***Online***	***All Audits***
Total kWh Saved	361,232	495,189	856,421
Total kW Reduced	234.2	235.4	469.6
Totals for All Three Companies			
	Telephone	***Online***	***All Audits***
Total kWh Saved	2,596,076	3,657,931	6,254,007
Total kW Reduced	1478.5	1218.8	2697.3

Audit Level Contributions to Electricity Savings

Ex post verified kWh savings and kW reductions were achieved in 2013 for those participants who engaged in a Level 2 or 3 telephone audit, a Level 1 online audit, or a Level 2 or Level 3 online audit. No electricity savings or demand reductions were achieved by participants who engaged in a Level 1 telephone audit.

For those participants using the online method, about 67 percent engaged in a Level 1 audit and about 33 percent in a Level 2 or Level 3 audit. For participants using the telephone method, nearly all (about 97 percent) engaged in a Level 2 or Level 3 audit.

The per participant energy savings values have increased slightly from program year 2012. It is expected that there will be some variation from year to year as the impacts are highly contingent upon the characteristics of the particular program year's participant population. The energy audit is a pathway to the structural and behavioral changes that

ultimately result in energy savings; this is unlike many other typical energy efficiency programs. For example, one would expect the results of a Refrigerator Recycling program to be highly consistent from year to year as the savings have little to do with the specific characteristics of the participants recycling the refrigerators. ADM believes the variance from 2012 to 2013 can be explained by the fact that 2013 participants were more likely to engage in the behavioral and structural changes that result in energy efficiency savings than 2012 participants. This is detailed in the table below Table 7-3.

Table 7-3: Energy Saving Actions

Type of Energy Saving Action	***2012***		***2013***	
	Telephone Audit	***Online Audit***	***Telephone Audit***	***Online Audit***
Structural (Equipment)	8.0%	9.8%	4.7%	18.6%
Behavioral	25.3%	49.7%	37.2%	69.3%

Persistence of Electricity Savings

Persistence in savings was identified for several audit groups from customers who participated in the OA program in 2010 and 2012. For customers who participated in the program in 2011, energy use in 2013 was less than pre-audit energy use. However, the decrease in energy use for these customers was less than for non-participants.

Process Findings

Differences between an Online Audit and a Telephone Audit

Customers may receive a home energy audit by telephone as part of the process of resolving a high bill complaint; however, home energy audits by telephones are not initiated by the customer. In contrast, online energy audits are initiated by customers, generally to understand how they can be more efficient in using electricity in their home.

Customers who receive a home energy audit by telephone may receive literature on how to save energy in the home, but they do not receive a customized, written home energy report like the online audit participants do.

In 2013, almost all customers receiving a telephone audit engaged in either Level 2 or 3 audits.

Differences between a Level 1 Audit and a Level 2 or Level 3 Audit

Telephone audits and online audits can be conducted at any of three levels of audit intensity. A Level 1 home energy audit is essentially limited to an examination of the

customer's billing history and does not help the customer discover ways to save energy in the home. The impact evaluation documented this fact in that energy savings were not associated with a Level 1 telephone audit.

A Level 2 audit allows the customer to complete a home appliance assessment and a Level 3 audit allows the customer to explore additional ways to save energy in the home, including weatherization options, cooling and heating options, lighting options, no-cost/low cost ways to save energy, options that require financial investment, and analysis of the returns on investment.

Of the 10,612 customers who received an online audit through the 2013 OA program, about a third (33 percent) received a Level 2 or 3 audit. Of the 4,545 customers who participated in telephone audits, nearly all (97 percent) received a Level 2 or 3 audits.

Energy Saving Actions of Online vs. Telephone Audit Participants

The online audit participants were more likely to take energy saving actions as a result of the home energy audit experience compared to telephone audit participants. Nearly three-fourths (about 88 percent) of the online audit participants reported taking structural or behavioral energy saving actions as a result of the home energy audit. By comparison just over a third (about 42 percent) of the telephone audit participants reported taking such actions. ADM believes that while online audit participants self-report more energy saving actions than phone audit participants, phone audit participants achieve a higher per participant savings because their attitudes towards energy efficiency aren't as strong as their online audit participant counterparts (phone audits are initiated through high-bill complaints while online audit participants seek out the Home Energy Analyzer through their own volition). Thus, many of the highest value energy efficiency structural and behavioral changes may have already been made by online audit participants prior to the audit.

More energy and demand savings can be realized if more online audit participants can be encouraged to engage the *Home Energy Analyzer* software application at audit levels 2 and 3. It is recommended that efforts to promote online use of home energy audits emphasize the need to go beyond a Level 1 audit in order to achieve reduced electricity consumption and savings on the customer's monthly electric bill. The Companies should consider increasing the frequency and content of bill inserts that advertise and promote online home energy audits using the Online Audit software.

Recommendations

More energy and demand savings can be realized if more online audit participants can be encouraged to engage the *Home Energy Analyzer* software application at audit levels 2 and 3. It is recommended that efforts to promote online use of home energy audits emphasize the need to go beyond a Level 1 audit in order to achieve reduced electricity consumption and savings on the customer's monthly electric bill. The Companies should consider increasing the frequency and content of bill inserts that advertise and promote online home energy audits using the Online Audit software.

7.2 Energy Conservation Kits

7.2.1 Energy Impacts

The overall 2013 evaluation results for estimated gross kWh energy savings and kW peak demand reductions for the Energy Conservation Kits subprogram in the Companies' service territories are summarized in Table 7-4.

Table 7-4: Ex Ante and Ex Post Gross kWh and kW by Operating Company

Operating Company	Ex Ante Expected Gross Savings		Ex Post Verified Gross Savings	
	Gross kWh	Gross kW	Gross kWh	Gross kW
CEI	42,324,983	4,227	31,573,249	3,372
OE	63,353,779	6,324	47,449,056	5,064
TE	20,689,152	2,068	15,531,633	1,657
All Companies	126,367,914	12,619	94,553,937	10,094

The gross kWh savings totals shown in Table 7-4 yield a program realization rate for kWh savings of 75%, as determined by the ratio of verified gross kWh savings to expected gross kWh savings. The realization rate for kW reductions was 80%.

Of the total kWh savings, roughly 84% resulted from direct standard kits measures, 15% from all electric kit measures, and less than 1% for schools kits measures. Standard kits measures accounted for slightly less than 79% of kW demand reductions, all electric kits measures accounted for 21% of kW reduction, and schools kits measures for less than 1%.

7.2.2 Process Findings

Direct Mail Kits

The following presents a selection of key conclusions from the current program year:

- **High Overall Program Performance:** The Energy Conservation Kit Program substantially exceeded its kit shipment goals for 2013. The goal for the 2013 program year was to send 105,733 kits, but approximately 230,000 kits were sent out in total. Power Direct and the Companies have been able to meet the higher than expected participation demands, and the working relationship between the two entities appears to be effective. The program appears to have sufficient staffing resources, budget, and participation potential to meet program objectives.

- **Growing Program Awareness:** The results of the process evaluation suggest that customer awareness of the program is increasing effectively, and that program marketing efforts have been highly effective thus far. Program staff noted that the outbound telephone call effort has been very successful, with 60% of contacted customers deciding to enroll in the program. Although only a small percentage of respondents indicated that they learned of the program through the utility website, more than one-third of all respondents stated that they enrolled in the program by using the online application. This suggests that the existing marketing channels are effectively directing prospective participants to the Ohio Energy Kit website where they can learn more information about the program and request a kit. Additionally, program staff reported that word of mouth has been an effective form of indirect marketing for the program, as participating customers have encouraged their friends, family members, and colleagues to enroll. These findings suggest that program awareness has increased dramatically during 2013.

- **High Participant Satisfaction:** Participants reported relatively high satisfaction levels for the 2013 program year, most notably for their overall program experience and the time taken to receive the conservation kits. Satisfaction ratings for individual measures were high overall as well, although some respondents provided commentary indicating that they had encountered difficulties with smart strips, CFLs, or furnace whistles. Instances of dissatisfaction were minimal, and appeared to be anecdotal in nature rather than representative of a core program issue.

- **Existing Measure Preference:** Based on the installation rate findings and other survey responses, participants preferred CFLs, smart power strips, and LED night lights to the other measures that were provided in conservation kits. Participants on average noted that these three measures were more useful than the showerheads,

furnace whistles, and faucet aerators, and several survey respondents provided open-ended commentary requesting additional smart strips and lighting.

Schools Kits

The following presents a selection of key conclusions from the current program year:

- **High Overall Program Performance:** Overall, program staff reported that the program has performed well, and that there have been very few significant challenges in the implementation or planning process. The pilot year is considered to be a success, and program staff expects that the program will be able to maintain or increase participation levels in future years. The staff interview suggests that the School Kits Program has sufficient staffing, budgetary, and promotional resources to meet its intended objectives during the current program cycle. Additionally, the remaining population of potential participant schools within the Companies' service territories appears sufficient to reach the expected kit distribution levels.
- **Potential for Greater Program Awareness:** The results of the process evaluation suggest that customer awareness of the program is sufficient to meet program goals, and that the program's marketing and promotional efforts have been well-received by responding customers. However, it appears that there remains an opportunity to increase program awareness and generate additional kit enrollment within the currently participating schools.
- **High Participant Satisfaction:** Participants reported very high satisfaction levels for the 2013 program year for all surveyed program elements. Satisfaction ratings for individual measures were high overall as well. Instances of dissatisfaction were very minimal and appeared to be related to individual participant preferences rather than representative of a core program issue.
- **Existing Measure Preference:** Based on the installation rate findings and other survey responses, participants preferred CFLs and LED night lights to the faucet aerators.

7.2.3 Recommendations

Direct Mail Kits

The evaluation team currently has the following recommendations for program improvement consideration.

- **Consider Measure Modifications:** The current set of measures provided in both versions of the energy conservation kits is sufficient for gauging initial program interest

and generating adequate savings. However, the Companies and Power Direct should continually consider the benefits of modifying the contents of conservation kits in order to potentially generate additional savings or appeal to a wider population of customers.

- **Assess Opportunities for Additional Cross-Promotion:** As a minority of participant survey respondents reported being aware of other energy efficiency programs, there is likely an opportunity to increase cross-participation potential by further improving kit recipient awareness levels. The conservation kits currently include educational brochures detailing additional residential energy programs, but it may also be useful to remind participants of these programs when sending follow-up postcards/flyers or when participants contact Power Direct or the Companies with questions about their conservation kit.

Schools Kits

The evaluation team currently has the following recommendations for program improvement consideration.

- **Consider Measure Modifications:** The current set of measures provided in both versions of the energy conservation kits is sufficient for the pilot program year and early program development. However, as the program continues it may be useful to explore alternative measures in order to appeal to the remaining non-participant population.
- **Assess Opportunities for Additional Cross-Promotion:** As a minority of participant survey respondents reported being aware of other energy efficiency programs, there is likely an opportunity to increase cross-participation potential by further improving kit recipient awareness levels. The school kit marketing and workbooks currently include information detailing additional residential energy programs, but it may also be useful to remind participants of these programs by sending follow-up postcards/flyers or when participants contact AM Conservation or the Companies with questions about their conservation kit.

7.3 New Homes

Energy Impacts

A total of 1,111 homes in the service territories of the three Companies received rebates through the Residential New Construction program in 2013. The number of participating builders in each service territory is shown in Table 7-5.

Table 7-5: Builder Participation by Utility

Operating Company	Number of Participants
CEI	15
OE	18*
TE	4
All Companies	37

**Final Dataset from Green Compass included three homes with no builder identified*

Estimated electric impacts were 2,622,297 kWh saved annually, which represents a realization rate of 88%. Average on-peak demand reduction was estimated to be 449 kW. Estimates of annual gross energy savings (kWh) and on-peak demand reductions (kW) for the program in the three Companies are reported in Table 7-6.

Table 7-6: New Homes Energy Impacts

Operating Company	Ex Ante Expected Gross Savings		Ex Post Verified Gross Savings	
	Gross kWh	Gross kW	Gross kWh	Gross kW
CEI	869,269	191	802,136	180
OE	1,791,097	345	1,543,728	241
TE	309,949	34	276,433	28
All Companies	2,970,315	571	2,622,297	449

Since its inception, the Companies' Residential New Construction Program has seen a fair amount of success. Identifying ways to educate stakeholders will be key to the continuing success of the program. Increasing builder participation from those not currently building to ENERGY STAR® Version 3.0 standards would also improve the success of the program. Increasing the number of builders involved in the program could increase the presence of ENERGY STAR® homes in the market and make homebuyers more aware of their benefits.

Continued support by the raters will continue to be a key component 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.

The program requirements are clear for builders and raters and trainings have been on target, which have been successful in helping move the program forward. Assuming construction picks up in 2014, targets are expected to be met.

Process Findings

- **The cost of going to ENERGY STAR® Version 3.0 is still viewed as too high for some builders.** The rebates from the New Homes program alone are perceived to not be high enough to cover the building materials and labor costs, and builders feel they are unable to recoup the costs in their sale price.

- **Satisfaction with program elements is high among builders, raters and homeowners.** All eight builders interviewed rated the program a four or higher when asked to rate their overall satisfaction with the program (1=very dissatisfied, 5=extremely satisfied). Using the same scale, four out of the six raters[67] we spoke to rated their overall satisfaction with the program a four or five. One said, *"Everything about the program I really enjoyed. Everything was really good."* Additionally, homeowners rate the performance and quality of their major appliances.

- **Builders understand the program's requirements.** None of the builders said there was anything about the program that was unclear to them.

- **The participating builders we spoke with plan to have all of their buildings qualify for the program in 2014.** All eight builders we spoke with plan to build all of their homes to the ENERGY STAR Version 3.0 standard. Builders feel the ENERGY STAR Version 3.0 will be standard in a few years, so building to this level now helps prepare them for the future. While accomplishing the advanced timeline for implementing efficiency measures, they are able to take advantage of available rebates.

- **Finding certified HVAC contractors has been an issue for a couple builders.** Two builders stated they have issues finding a certified HVAC contractor in their area to perform the work required by ENERGY STAR 3.0. One said this is a result of being in an area with not much new construction. There is not enough demand for such services, and it is a cost to the HVAC contractor to be certified and then to have to renew it annually. It is also an added cost to the builder, since certified HVAC contractors cost more.

- **Raters continue to report an excellent working relationship with PSD.** PSD staff is viewed as responsive, knowledgeable, experienced, and helpful.

- **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

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

submission process is easy. Raters who primarily work with multifamily buildings expressed dissatisfaction again this year 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) has improved.** PSD made improvements to their processes and have since expedited their feedback of QA reports to alleviate the situation of notifications of a failed QA report being received after homeowner have moved in and the builders can no longer rectify the issue. The raters reported the situation as having improved, and there were no additional issues mentioned.

- **Concerns expressed by raters about the dependency the builders have on them have decreased.** This year, there were no expressed concerns from any raters. This likely is related to the fact that the builders now understand the program's requirements.

- **The program is running steadily with the only significant issue being low new construction rates.** Working with PSD has been going well, and both builders and raters are more familiar with the program and its requirements. The primary issue in 2013 was the lack of new construction in certain areas of the state.

- **Realtors are influential in the homebuyer's decision to purchase a home.** For homebuyers who worked with a realtor, 100 percent of them said the realtor's discussion of the energy efficiency of the home influenced their decision to buy the home.

Recommendations

The Companies' Residential New Construction Program is relatively new, but continues to improve each year. 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.

- **Continue to increase and expand marketing outreach efforts of the program.** 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. Additionally,

outreach can be directed to larger players such as large real estate companies and builder associations. Homebuyers mentioned their realtor helped influence their decision, so ensuring realtors are educated on the program will continue to be important in the future.

- **Modify the COMPASS reporting tool for submission of multifamily buildings.** All of the raters we spoke to found the software easy to use; however, it was mentioned that entering the information for multifamily homes is onerous because address information has to be filled out repeatedly for each submitted unit. Updating the software so address information only needs to be entered once, and the software would prefill that information for subsequent units, will save time and help encourage builder participation.

- **Create a case study marketing piece for builders and raters to hand out.** Two builders mentioned they would like to have some sort of case study handout showing the difference between a standard code home and an ENERGY STAR home, and what the cost savings look like. They feel this will help encourage homebuyers to spend the money upfront to upgrade or purchase an ENERGY STAR home.

- **Additional data in SSRS database.** To improve the evaluation process, ADM recommends that several key data fields be added to the SSRS database. First, the assessor's parcel number (APN) should be added for each site in the program. Adding the APN to the data base could potentially eliminate issues with incorrect addresses being input into the program data base. Additionally, the builder for each home in the program should be included in the SSRS database. Much of the program sampling is based on builder as well as EDC and the lack of builder data in the SSRS interferes with proper program sample development.

Rem/Rate software version requirements. ADM recommends that all raters and builders that submit Rem/Rate models be required to use a more recent version of the software. Realization rates below 100% are partially due to differences in calculation methods used in various versions of Rem/Rate. Newer versions of Rem/Rate (version 14 and newer) include upgrades to the calculation methods that include improvements to lighting and appliance, ground source heat pump, and domestic water heater calculations. Using older versions of the software could result in erroneously high *ex ante* estimates, lower realization rates, and overpaid incentives.

7.4 Behavioral

A total of 73,000 customers participated in the Behavioral Modification program in Ohio during 2013. Of these participants, a little over half (53%) were in the OE service territory, while a third were from CEI and 14% were from TE.

7.4.1 Energy Impacts

For all participants combined across all service territories during 2013, e*x ante* expected annual kWh savings were 12,731,000 kWh. The *ex post* verified annual electricity savings for all participants combined in 2013 were 12,792,850 kWh. The ratio of ex post to ex ante total electricity savings yields an overall realization rate of about 100 percent for kWh savings for the 2013 BMod program.

For all participants combined across all service territories during 2013, *ex ante* expected critical peak demand kW reduction was 1,453 kW. The *ex post* verified critical peak kW reduction for all home energy audits combined in 2013 was 1,460 kW. The ratio of ex post to ex ante total demand reductions yields an overall realization rate of about 100 percent for kW reductions for the 2013 BMod program.

Table 7-7 shows program-level results for kWh savings and kW reductions for the 2013 BMod program for each of the Companies.

Table 7-7: Program Level Results for 2013 Behavioral Modification Program

	Ex Ante Savings		***Ex Post Savings***	
	kWh	***kW***	***kWh***	***kW***
Savings by Utility Company				
CEI	10,395,000	1187	8,429,575	962.5
OE	1,176,000	134	3,222,975	367.5
TE	1,160,000	132	1,140,300	130
Total	12,731,000	1,453	12,792,850	1,460

7.4.2 Process Findings

Over 40% of participants indicated that the information contained in HERs was very helpful, and most often cited the comparison to neighbors consumption was most helpful. While over 75% of survey respondents reported that they made either a structural or behavioral change as a result of the HERs, more respondents made structural changes to their homes as opposed to behavioral changes. While most structural changes were made to appliances, some of the behavioral changes reported are listed below:

- Keeping blinds closed during the day in the summer time.
- Adjustments to thermostats.
- Hanging clothes outside to dry during warmer weather.
- Opening windows instead of running the air conditioner.
- Turning off lights when not in use.

Overall satisfaction is high, over 80% of survey respondents reported that they were either "Very" or "Somewhat" satisfied with the HERs.

7.4.3 Recommendations

In light of the above evaluation findings, ADM makes the following recommendations:

- Both the impact and process evaluations indicated that few customers who received HERs also participated in other utility-sponsored energy conservation programs. The Companies should consider marketing other programs on the HERs. Particularly, cross-marketing programs like Appliance Turn-In and Energy Efficient Products may result in increased program participation since the process evaluation implied that Behavioral Modification program participants have a propensity to make structural changes.

8. Appendix A: Required Savings Tables

Tables showing measure-level participation counts and savings for the Program were provided in various locations throughout this report. This appendix provides additional tables summarizing savings results. Throughout Appendix A, lifetime savings are presented. Lifetime savings were calculated as shown in

Equation 23: Calculation of Lifetime Savings

Lifetime Savings = Measure Life x Annualized Savings

8.1 Audits

8.1.1 Comprehensive Home Audit

Table 8-1: Ex Post Annual kWh Savings by Measure and Operating Company

Operating Company	***CEI***	***OE***	***TE***	***Total***
Direct Install Measures				
12/22/33 Watt 3-way CFL	20,817	18,883	5,929	45,629
13 Watt CFL (60 watt)	93,531	98,101	33,208	224,841
14W Globe CFL	23,040	33,818	10,892	67,749
20 Watt CFL (75 watt)	56,887	59,846	23,718	140,451
25 Watt CFL (100 watt)	45,028	55,426	18,847	119,301
7W Candelabra CFL	3,404	4,921	1,046	9,371
9W Candelabra CFL	3,401	2,716	448	6,565
Bath Aerators	1,642	1,853	265	3,760
Kitchen Aerators	432	618	124	1,174
EHW Pipe Insulation	3,657	5,095	550	9,302
Low Flow Showerheads	4,376	6,381	729	11,486
Total kWh Savings - Direct Install	**256,215**	**287,658**	**95,755**	**639,628**
Rebate Measures				
Attic Insulation	3,984	13,942	5,531	23,457
Wall Insulation	868	23,737	18,064	42,670
Duct Sealing	-	126	266	392
ENERGY STAR Windows	143,715	126,974	29,343	300,032
Total kWh Savings - Rebate Measures	**148,567**	**164,779**	**53,204**	**366,551**
Grand Total kWh Savings	**404,782**	**452,438**	**148,960**	**1,006,179**

Table 8-2: Ex Post Annual kW Savings by Measure and Operating Company

Operating Company	***CEI***	***OE***	***TE***	***Total***
Direct Install Measures				
12/22/33 Watt 3-way CFL	2.49	2.26	0.71	5.46
13 Watt CFL (60 watt)	11.19	11.73	3.97	26.89
14W Globe CFL	2.76	4.04	1.30	8.10
20 Watt CFL (75 watt)	6.80	7.16	2.84	16.80
25 Watt CFL (100 watt)	5.39	6.63	2.25	14.27
7W Candelabra CFL	0.41	0.59	0.13	1.12
9W Candelabra CFL	0.41	0.32	0.05	0.79
Bath Aerators	0.21	0.24	0.03	0.48
Kitchen Aerators	0.06	0.08	0.02	0.15
EHW Pipe Insulation	0.42	0.58	0.06	1.06
Low Flow Showerheads	0.56	0.82	0.09	1.47
Total kW Savings - Direct Install	**30.68**	**34.45**	**11.46**	**76.59**
Rebate Measures				
Attic Insulation	0.91	12.88	5.74	19.53
Wall Insulation	1.10	17.97	8.09	27.16
Duct Sealing	-	0.07	0.14	0.20
ENERGY STAR Windows	64.15	52.36	11.99	128.50
Total kW Savings - Rebate Measures	**66.17**	**83.28**	**25.95**	**175.40**
Grand Total kW Savings	**96.85**	**117.73**	**37.41**	**251.99**

Table 8-3: Lifetime Ex Post Energy Savings (kWh)

Operating Company	***CEI***	***OE***	***TE***	***Total***
Direct Install Measures				
12/22/33 Watt 3-way CFL	166,533	151,066	47,434	365,032
13 Watt CFL (60 watt)	654,719	686,709	232,457	1,573,886
14W Globe CFL	184,321	270,540	87,133	541,994
20 Watt CFL (75 watt)	398,210	418,924	166,024	983,158
25 Watt CFL (100 watt)	315,195	387,982	131,927	835,104
7W Candelabra CFL	27,232	39,372	8,366	74,970
9W Candelabra CFL	27,209	21,725	3,586	52,519
Bath Aerators	16,415	18,533	2,648	37,596
Kitchen Aerators	4,324	6,178	1,236	11,738
EHW Pipe Insulation	54,854	76,422	8,255	139,531
Low Flow Showerheads	43,756	63,810	7,293	114,859
Total Lifetime kWh Savings - Direct Install	**1,892,768**	**2,141,262**	**696,358**	**4,730,387**
Rebate Measures				
Attic Insulation	99,596	348,541	138,281	586,418
Wall Insulation	21,697	593,433	451,611	1,066,741
Duct Sealing	-	2,520	5,320	7,840
ENERGY STAR Windows	3,592,879	3,174,358	733,569	7,500,806
Total Lifetime kWh Savings – Rebate	**3,714,173**	**4,118,852**	**1,328,781**	**9,161,806**
Grand Total Lifetime kWh Savings	**5,606,941**	**6,260,114**	**2,025,138**	**13,892,193**

8.1.2 Online Audit

Table 8-4: Online Audit Program Level kWh Savings and kW Reduction

	Measure Life	Annual Savings		Lifetime Savings	
		kWh	kW	kWh	kW
Savings by Utility Company					
CEI	3	1,959,299	907.1	5,877,896	2721.2
OE	3	3,438,287	1320.7	10,314,862	3962.1
TE	3	856,421	469.6	2,569,262	1408.7
Savings by Type of Audit					
Online Audits	3	3,657,931	1218.8	10,973,793	3656.4
Telephone Audits	3	2,596,076	1478.5	7,788,227	4435.6
Savings for All Audits					
All Audits	3	6,254,007	2,697.3	18,762,020	8092.0

8.2 Energy Conservation Kits

Table 8-5: Ex Post Annual kWh Savings by Measure and Operating Company

Operating Company	*CEI*	*OE*	*TE*	*Total*
Standard Kit Measures				
13W CFL	9,254,405	13,549,344	4,368,018	27,171,768
20W CFL	4,839,369	7,085,305	2,284,151	14,208,824
26W CFL	7,070,377	10,351,716	3,337,172	20,759,264
LED Nightlight	1,045,798	1,531,149	493,610	3,070,556
Furnace Whistle	1,689,104	2,473,012	797,246	4,959,363
7 Plug Smart Strip	3,414,105	4,998,580	1,611,435	10,024,121
Total for Standard Kit Measures	**27,313,159**	**39,989,105**	**12,891,632**	**80,193,895**
All Electric Kit Measures				
13W CFL	1,056,251	1,882,130	636,108	3,574,488
20W CFL	552,341	984,215	332,637	1,869,193
26W CFL	806,977	1,437,950	485,987	2,730,913
LED Nightlight	119,362	212,691	71,884	403,936
Furnace Whistle	192,786	343,524	116,102	652,412
7 Plug Smart Strip	389,669	694,349	234,671	1,318,689
Faucet Aerator*	71,133	126,752	42,839	240,724
Showerhead*	966,671	1,722,508	582,160	3,271,339
Total Numbers for All Electric Measures	**4,155,189**	**7,404,119**	**2,502,387**	**14,061,694**
Schools Kit Measures				
13W CFL	65,516	34,870	85,947	186,334
18W CFL	22,608	12,033	29,659	64,300
LED Nightlight	3,922	2,087	5,145	11,154
Faucet Aerator*	12,854	6,842	16,863	36,559
Total Numbers for Schools Kits Measures	**104,901**	**55,832**	**137,614**	298,347
Grand Total	**31,573,249**	**47,449,056**	**15,531,633**	**94,553,937**

*Energy savings only occur for these measures in homes with an electric water heater

Table 8-6: Ex Post Annual kW Savings by Measure and Operating Company

Operating Company	***CEI***	***OE***	***TE***	***Total***
Standard Kit Measures				
13W CFL	1,107	1,621	522	3,250
20W CFL	579	847	273	1,699
26W CFL	846	1,238	399	2,483
LED Nightlight	0	0	0	0
Furnace Whistle	0	0	0	0
7 Plug Smart Strip	399	583	188	1,170
Total for Standard Kit Measures	**2,930**	**4,290**	**1,383**	**8,603**
All Electric Kit Measures				
13W CFL	126	225	76	428
20W CFL	66	118	40	224
26W CFL	97	172	58	327
LED Nightlight	0	0	0	0
Furnace Whistle	0	0	0	0
7 Plug Smart Strip	45	81	27	154
Faucet Aerator	9	16	5	30
Showerhead	88	157	53	298
Total for All Electric Measures	**431**	**769**	**260**	**1,460**
Schools Kit Measures				
13W CFL	8	4	10	22
18W CFL	3	1	4	8
LED Nightlight	0	0	1	1
Faucet Aerator	0	0	0	0
Total for Schools Kits Measures	**11**	**6**	**14**	31
Grand Total	**3,372**	**5,064**	**1,657**	**10,094**

Table 8-7: Lifetime Ex Post Energy Savings (kWh)

Operating Company	***CEI***	***OE***	***TE***	***Total***
Standard Kit Measures				
13W CFL	43,958,425	64,359,384	20,748,088	129,065,896
20W CFL	33,875,585	49,597,132	15,989,054	99,461,770
26W CFL	49,492,639	72,462,009	23,360,201	145,314,848
LED Nightlight	8,366,381	12,249,190	3,948,877	24,564,448
Furnace Whistle	25,336,567	37,095,183	11,958,693	74,390,443
7 Plug Smart Strip	13,656,421	19,994,320	6,445,741	40,096,482
Total for Standard Kit Measures	**174,686,017**	**255,757,218**	**82,450,653**	**512,893,887**
All Electric Kit Measures				
13W CFL	5,017,190	8,940,117	3,021,512	16,978,819
20W CFL	3,866,386	6,889,503	2,328,461	13,084,350
26W CFL	5,648,837	10,065,647	3,401,910	19,116,393
LED Nightlight	954,896	1,701,526	575,069	3,231,491
Furnace Whistle	2,891,786	5,152,866	1,741,526	9,786,178
7 Plug Smart Strip	1,558,674	2,777,397	938,683	5,274,754
Faucet Aerator	711,333	1,267,522	428,387	2,407,243
Showerhead	9,666,709	17,225,081	5,821,600	32,713,390
Total for All Electric Measures	**30,315,812**	**54,019,658**	**18,257,148**	**102,592,618**
Schools Kit Measures				
13W CFL	313,168	166,679	410,828	890,675
18W CFL	158,259	84,231	207,611	450,102
LED Nightlight	39,220	20,874	51,450	111,544
Faucet Aerator	102,835	54,732	134,904	292,472
Total for Schools Kits Measures	**613,482**	**326,516**	**804,793**	**1,744,792**
Grand Total	**205,615,311**	**310,103,392**	**101,512,594**	**617,231,297**

8.3 New Homes

Lifetime savings are presented for the New Homes subprogram by operating company in Table 8-8.

Table 8-8: New Homes Lifetime Savings by Operating Company

Operating Company	*Number of Participants*	*Annual ex Post kWh Savings*	*Annual ex Post kW Savings*	*Lifetime kWh*
CEI	15	802,136	180	20,053,410
OE	18	1,543,728	241	38,593,200
TE	4	276,433	28	6,910,813
Combined	**37**	**2,622,297**	**449**	**65,557,423**

8.4 Behavioral

The Lifetime savings for the Behavioral Modification program in 2013 is 1 year. Until future data is procured for program participants it is impossible to tell if savings persist past the initial program year. Thus the lifetime savings is the same as the 2013 annualized savings.

Table 8-9: Behavior Modification Program Level kWh Savings and kW Reduction

	Ex Ante Savings		***Ex Post Savings***	
	kWh	***kW***	***kWh***	***kW***
Savings by Utility Company				
CEI	10,395,000	1187	8,429,575	962.5
OE	1,176,000	134	3,222,975	367.5
TE	1,160,000	132	1,140,300	130
Total	12,731,000	1,453	12,792,850	1,460

9. Appendix B: Audit Survey Instruments

9.1 Comprehensive Home Audit Participant Survey

Q1. Hello, my name is [INTERVIEWER NAME]. ADM Associates is an independent research firm conducting this survey on behalf of [EDC]. We are surveying households that participated in [EDC]'s 2013 Residential Energy Audit Program. May I please speak to the person who would know the most about [EDC] your home energy audit?

1. Yes
2. No [THANK AND TERMINATE INTERVIEW]

Q2. According to our records, you received a home energy audit through this program and may also have had various energy efficiency measures installed in your home based on the recommendations of the home energy auditor. Measures may have included the direct installation of compact fluorescent lamps (CFLs), low flow showerheads, faucet aerators, or hot water pipe wrap insulation. You may also have received a rebate for an Energy Star ceiling fan or items installed in your home by a home improvement contractor, including attic or wall insulation, duct sealing, or Energy Star windows.

We received your phone number from [EDC] because you are listed as the person on the account receiving a residential energy audit or the person who applied for a product rebate through this program. We are surveying program participants to verify information and assess customer satisfaction about the individual products and services in order to assess program benefits for customers and future program offerings. May I complete this survey with you?

1. Yes
2. No [THANK AND TERMINATE INTERVIEW]

Online Introduction:
ADM Associates, Inc. is an independent research firm conducting this survey on behalf of [EDC]. We are surveying households that participated in [EDC]'s 2013 Residential Energy Audit Program.

According to our records, you received a home energy audit through this program and may also have had various energy efficiency measures installed in your home depending on the recommendations of the home energy auditor. These measures may have

included the direct installation of compact fluorescent lamps (CFLs), low flow showerheads, faucet aerators, or hot water pipe wrap insulation. You may also have received a rebate for an Energy Star ceiling fan or items installed in your home by a home improvement contractor, including attic or wall insulation, HVAC system duct sealing, or Energy Star windows.

We received your email address from [EDC] because you are listed as the person on the account receiving a residential energy audit or the person who applied filed for a product rebate through this program. We are surveying program participants to verify information about the products and services received and to assess customer satisfaction with the individual chose products and services in order to access assess program benefits for customers and future program offerings.

Q3. Do you recall participating in the 2013 Residential Energy Audit Program?
1. Yes
2. No [THANK AND TERMINATE INTERVIEW]
98. Don't Know [THANK AND TERMINATE INTERVIEW]

Q4. How did you hear about the Residential Energy Audit Program? (Do not read; Prompt if necessary)
1. Contractor
2. Retail Store
3. Bill Insert
4. Direct Mail from electric company
5. Energy Save Ohio website
6. Print Ad
7. TV
8. Word-of-Mouth
97. Other (Specify)

1. Our records show that you had Energy Star CFLs directly installed in your home by a home energy auditor. Is this correct?
    1. Yes
    2. No
    98. Don't know

2. Our records show that you had Low Flow Showerheads directly installed in your home by a home energy auditor. Is this correct?

1. Yes
2. No
98. Don't know

3. Our records show that you had Kitchen and/or Bath Faucet Aerators directly installed in your home by a home energy auditor. Is this correct?
    1. Yes
    2. No
    98. Don't know

4. Our records show that you had Pipe Wrap Insulation directly installed in your home by a home energy auditor. Is this correct?
    1. Yes
    2. No
    98. Don't know

[DISPLAY CFLS IF Q**Error! Reference source not found.** = 1]
CFLS
I would like to ask you some questions about the CFLs that may have been installed in your home. CFL bulbs are the bulbs that are "corkscrew" in shape or in a double U-shape.

5. According to our records, you had [NUMBER OF CFLs] CFLs installed in your home by a home energy auditor. Is that correct?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2]
6. What is the correct number of CFLs that were installed by the auditor?
    1. Correct number of CFLs installed:
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]
7. Were you given additional CFLs to install later?
    1. Yes

2. No
98. Don't know

[DIPSLAY Q**Error! Reference source not found.** and Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]
8. How many CFLs were you given?

9. Did you install any of the additional CFLs yourself?
   1. Yes
   2. No
   98. Don't Know

[DISPLAY IF Q**Error! Reference source not found.** = 1]
Now I would like to ask you some questions about the CFLs that were installed. When answering the following questions, I would like you to think of the CFLs that were installed by the home auditor and any additional CFLs that were left by the auditor that you may have installed.

10. Which of the following rooms did new CFLs get installed in by either the auditor, or yourself. The bulbs must have been provided by the program. (Select all that apply)
(Do not read; prompt if necessary)
    1. Bedrooms
    2. Bathrooms
    3. Living Room
    4. Kitchen
    5. Entry Way
    6. Dining Room
    7. Garage
    8. Basement
    9. Den
    10. Stairway
    11. Office
    12. Hallway
    97. Other Room/Location
    98. Don't Know

11. Did the CFLs in your [ROOM SELECTED FROM Q10] replace traditional incandescent light bulbs, replace another CFL, or were they installed in a new fixture? (Select all that apply)

1. Incandescent
2. CFLs
3. Installed in new fixture
98. Don't Know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

12. How many watts were the incandescent bulbs replaced in this room?
    1. 60 watts or higher
    2. Less than 60 watts
    98. Don't Know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 3]

13. How many of the new CFLs were installed in a new light fixture?
    1. Number of CFLs installed in new light fixture:
    98. Don't Know

14. Before the CFLs were installed by the home energy auditor, did you have any CFLs installed in your home?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

15. How many CFLs were installed in your home before the home energy audit?

16. Would you purchase CFLs in the future?
    1. Yes
    2. No
    98. Don't Know

17. How satisfied or dissatisfied are you with the new CFLs? Would you say you are: (Read list)
    1. Very dissatisfied
    2. Dissatisfied
    3. Neither satisfied or dissatisfied
    4. Satisfied

5. Very satisfied
98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1 or 2]
18. Why are you dissatisfied with your new CFLs?

[DISPLAY FAUCET AERATORS IF Q**Error! Reference source not found.** = 1]

FAUCET AERATORS
19. Our records show that the home energy auditor installed [QUANTITY FROM DB] faucet aerators in your bathroom. Is that correct?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2]
20. What is the correct number of bath faucet aerators that were installed?
    1. Number of bath aerators installed:
    98. Don't know

21. Did you remove any of the bath faucet aerators?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]
22. How many bath faucet aerators did you remove?
    1. Number of aerators removed:
    98. Don't know

23. How satisfied or dissatisfied are you with the new bath faucet aerators? Would you say you are: (Read list)
    1. Very dissatisfied
    2. Dissatisfied
    3. Neither satisfied or dissatisfied
    4. Satisfied

5. Very satisfied
98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1 or 2]

24. Why are you dissatisfied with your bath faucet aerators?

25. Our records show that the home energy auditor installed [QUANTITY FROM DB] faucet aerators in your kitchen. Is that correct?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2]

26. What is the correct number of kitchen faucet aerators that were installed?
    1. Number of aerators installed
    98. Don't know

27. Did you remove any of the kitchen faucet aerators?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

28. How many kitchen faucet aerators did you remove?

29. How satisfied or dissatisfied are you with the kitchen faucet aerators? Would you say you are: (Read list)
    1. Very dissatisfied
    2. Dissatisfied
    3. Neither satisfied or dissatisfied
    4. Satisfied
    5. Very satisfied
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1 or 2]

30. Why are you dissatisfied with your kitchen faucet aerators?

[DISPLAY LOW FLOW SHOWERHEADS IF Q**Error! Reference source not found.** = 1]

LOW FLOW SHOWERHEADS

31. Our records show that the home energy auditor installed [NUMBER OF SHOWERHEADS] low flow showerheads. Is that correct?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2]

32. What is the correct number of low flow showerheads that were installed?

33. Did you remove any of the low flow showerheads?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.**IF Q**Error! Reference source not found.** = 1]

34. How many of the low flow showerheads did you remove?

35. How satisfied or dissatisfied are you with the low flow showerheads? Would you say you are: (Read list)
    1. Very dissatisfied
    2. Dissatisfied
    3. Neither satisfied or dissatisfied
    4. Satisfied
    5. Very satisfied
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

36. Why are you dissatisfied with your low flow showerheads?

[DISPLAY PIPE WRAP INSULLATIONS IF Q**Error! Reference source not found.** = 1]

PIPE WRAP INSULLATIONS

37. Our records show that the home energy auditor installed pipe wrap insulation for your hot water heater. Is that correct?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

38. Was an insulating tank blanket installed in addition to the pipe wrap installation?
    1. Yes, the auditor installed an insulating tank blanket.
    2. No, there was a preexisting tank blanket.
    3. No, heater is tankless.
    4. No, there was no existing insulating tank blanket and the auditor didn't install one

98. Don't Know

39. Was an insulating tank blanket installed in addition to the pipe wrap installation?
    1. Yes, the auditor installed an insulating tank blanket.
    2. No, there was a preexisting tank blanket.
    3. No, heater is tankless.
    4. No, there was no existing insulating tank blanket and the auditor didn't install one
    98. Don't Know

40. How satisfied or dissatisfied are you with the pipe wrap insulation? Would you say you are: (Read list)
    1. Very dissatisfied
    2. Dissatisfied
    3. Neither satisfied or dissatisfied
    4. Satisfied
    5. Very satisfied
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1 or 2]

41. Why are you dissatisfied with the pipe wrap for your hot water heater?

42. Did the auditor make recommendations for additional energy saving home improvements such as installing insulation, new windows, or duct sealing?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

43. How satisfied or dissatisfied are you with the recommendations made by the auditor? (Read list)
    1. Very dissatisfied
    2. Dissatisfied
    3. Neither satisfied or dissatisfied
    4. Satisfied
    5. Very satisfied
    98. Don't know

44. Our records show that you received a rebate from [EDC] for an attic installation by a participating contractor. Is that correct?
    1. Yes
    2. No
    98. Don't know

45. Our records show that you received a rebate from [EDC] for wall insulation by a participating contractor. Is that correct?
    1. Yes
    2. No
    98. Don't know

46. Our records show that you received a rebate from [EDC] for an Energy Star qualified Window installation by a participating contractor. Is that correct?
    1. Yes
    2. No
    98. Don't know

47. Our records show that you received a rebate from [EDC] for a duct sealing installation by a participating contractor. Is that correct?
    1. Yes
    2. No
    98. Don't know

48. Our records show that you received a rebate from [EDC] for an Energy Star qualified Ceiling Fan installation by a participating contractor. Is that correct?
    1. Yes
    2. No
    98. Don't know

[DISPLAY ATTIC INSULATION IF Q**Error! Reference source not found.** = 1]

ATTIC INSULATION

49. Why did you decide to install the attic insulation? Was your decision related to:

	Yes	No	DK
The rebate incentive amount provided	1	2	98
Being able to cover the out-of-pocket costs	1	2	98
Being able to finance the costs of the retrofit	1	2	98
Realizing a good payback period for the investment	1	2	98
The retrofit recommendation seemed credible	1	2	98
The expected impact of attic insulation on reducing my electric bill	1	2	98
The expected impact of attic insulation on home comfort	1	2	98

50. Were there any other reasons for your decision to install the attic insulation?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

51. What other factors were important to your decision to not install the attic insulation?

52. What would you say was the most important factor in your decision to install the attic insulation? (Don't read; prompt if necessary)
    1. The rebate incentive amount provided
    2. Being able to cover the out-of-pocket costs
    3. Being able to finance the costs of the retrofit
    4. Realizing a good payback period for the investment
    5. The retrofit recommendation seemed credible
    6. The expected impact of attic insulation on reducing my electric bill
    7. The expected impact of attic insulation on home comfort
    97. Other (Specify)
    98. Don't know

53. Please indicate if you are very dissatisfied, dissatisfied, neither dissatisfied nor satisfied, satisfied, or very satisfied with the following aspects of the attic insulation. (Read a-d)

	VD	D	N	S	VS	DK
a. Rebate application process	1	2	3	4	5	98
b. Rebate dollar amount you received	1	2	3	4	5	98
c. Insulation performance for saving energy	1	2	3	4	5	98
d. Insulation performance for increased comfort	1	2	3	4	5	98

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.**a-Q**Error! Reference source not found.**d = 1 or 2]

54. Why are you dissatisfied with the attic insulation?

55. What was your approximate total out-of-pocket cost for installing the additional attic insulation?

[DISPLAY WALL INSULLATION IF Q**Error! Reference source not found.** = 1]

WALL INSULATION

56. Why did you decide to install the wall insulation? Was your decision related to:

	Yes	No	DK
The rebate incentive amount provided	1	2	98
Being able to cover the out-of-pocket costs	1	2	98
Being able to finance the costs of the retrofit	1	2	98
Realizing a good payback period for the investment	1	2	98

The retrofit recommendation seemed credible	1	2	98
The expected impact of wall insulation on reducing my electric bill	1	2	98
The expected impact of wall insulation on increasing comfort level	1	2	98
The expected impact of wall insulation on reducing outside noise.	1	2	98

57. Were there any other reasons your decision to install the wall insulation?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

58. What other factors were important to your decision to not install the wall insulation?

59. What would you say was the most important factor to your decision to install the wall insulation?
    1. The rebate incentive amount provided
    2. Being able to cover the out-of-pocket costs
    3. Being able to finance the costs of the retrofit
    4. Realizing a good payback period for the investment
    5. The retrofit recommendation seemed credible
    6. The expected impact of wall insulation on reducing my electric bill
    7. The expected impact of wall insulation on increasing comfort level
    8. The expected impact of wall insulation on reducing outside noise.
    97. Other (Specify)
    98. Don't know

60. Please indicate if you are very dissatisfied, dissatisfied, neither dissatisfied nor satisfied, satisfied, or very satisfied with the following aspects of the wall insulation.

	VD	D	N	S	VS	DK
a. Rebate application process	1	2	3	4	5	98
b. Rebate dollar amount you received	1	2	3	4	5	98

c. Insulation performance for saving energy 1 2 3 4 5 98
d. Insulation performance for increasing comfort 1 2 3 4 5 98

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.Error! Reference source not found.-Error! Reference source not found.Error! Reference source not found.** = 1 or 2]

61. Why are you dissatisfied with the wall insulation?

62. What was your approximate total out-of-pocket cost for installing the additional wall insulation?

[DISPLAY ENERGY STAR QUALIFIED WINDOWS IF Q**Error! Reference source not found.** = 1]

ENERGY STAR QUALITY WINDOWS

63. Why did you decide to install the Energy Star qualified windows? Was your decision related to:

	Yes	No	DK
The rebate incentive amount provided	1	2	98
Being able to cover the out-of-pocket costs	1	2	98
Being able to finance the costs of the retrofit	1	2	98
Realizing a good payback period for the investment	1	2	98
The retrofit recommendation seemed credible	1	2	98
The expected impact of energy efficient windows on reducing my electric bill	1	2	98
Increased comfort gained from installing windows	1	2	98
The appearance of the windows	1	2	98

64. Were there any other reasons for your decision to install the windows?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

65. What other factors were important to your decision to not install the windows?

66. What would you say was the most important factor to your decision to install the Energy Star qualified windows?
    1. The rebate incentive amount provided
    2. Being able to cover the out-of-pocket costs
    3. Being able to finance the costs of the retrofit
    4. Realizing a good payback period for the investment
    5. The retrofit recommendation seemed credible
    6. The expected impact of energy efficient windows on reducing my electric bill
    7. Increased comfort gained from installing windows
    8. Aesthetic value provided by windows
    97. Other (Specify)
    98. Don't know

67. Please indicate if you are very dissatisfied, dissatisfied, neither dissatisfied nor satisfied, satisfied, or very satisfied with the following aspects of the Energy Star windows installation.

	VD	D	N	S	VS	DK
a. Rebate application process	1	2	3	4	5	98
b. Rebate dollar amount you received	1	2	3	4	5	98
c. Window performance for saving energy	1	2	3	4	5	98
d. Window performance for increasing comfort	1	2	3	4	5	98

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.Error! Reference source not found.** – Q**Error! Reference source not found.Error! Reference source not found.=** 1 or 2]

68. Why are you dissatisfied with the Energy Star windows installation?

69. What was your approximate total out-of-pocket cost for installing the Energy Star qualified windows?

[DISPLAY DUCT SEALING IF Q**Error! Reference source not found.** = 1]

DUCT SEALING

70. Why did you decide to seal the ducts in your home? Was your decision related to:

	Yes	No	DK
The rebate incentive amount provided	1	2	98

Being able to cover the out-of-pocket costs	1	2	98
Being able to finance the costs of the retrofit	1	2	98
Realizing a good payback period for the investment	1	2	98
The retrofit recommendation seemed credible	1	2	98
The expected impact of sealed ducts on reducing my electric bill	1	2	98

71. Were there any other factors that were important to your decision to seal the ducts in your home?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

72. What other factors were important to your decision to seal the ducts in your home?

73. What would you say was the most important factor to your decision to seal the ducts in your home?

    1. The rebate incentive amount provided
    2. Being able to cover the out-of-pocket costs
    3. Being able to finance the costs of the retrofit
    4. Realizing a good payback period for the investment
    5. The retrofit recommendation seemed credible
    6. The expected impact of sealed ducts on reducing my electric bill
    97. Other (Specify)
    98. Don't know

74. Please indicate if you are very dissatisfied, dissatisfied, neither dissatisfied nor satisfied, satisfied, or very satisfied with the following aspects of the duct sealing job that was performed:

	VD	D	N	S	VS	DK
a. Rebate application process	1	2	3	4	5	98
b. Rebate dollar amount you received	1	2	3	4	5	98
c. Duct performance for saving energy	1	2	3	4	5	98

d. Duct performance for increasing comfort 1 2 3 4 5 98

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.Error! Reference source not found.**-Q**Error! Reference source not found.Error! Reference source not found.** = 1 or 2]

75. Why are you dissatisfied with the duct sealing job?

76. What was your approximate total out-of-pocket cost for the duct sealing job?

ENERGY STAR QUALITY CEILING FANS

77. Why did you decide to install the Energy Star ceiling fans? Was your decision related to:

	Yes	No	DK
The rebate incentive amount provided	1	2	98
Being able to cover the out-of-pocket costs	1	2	98
Being able to finance the costs of the retrofit	1	2	98
Realizing a good payback period for the investment	1	2	98
The retrofit recommendation seemed credible	1	2	98
The expected impact of ceiling fans on reducing my electric bill	1	2	98
The expected impact of ceilings fans on comfort level	1	2	98
Aesthetic value provided by fan			

78. Were there any other reasons for your decision to install the ceiling fans?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

79. What other factors were important to your decision to install the ceiling fans?

80. What would you say was the most important factor to your decision to install the ceiling fans?
    1. The rebate incentive amount provided
    2. Being able to cover the out-of-pocket costs
    3. Being able to finance the costs of the retrofit
    4. Realizing a good payback period for the investment

5. The retrofit recommendation seemed credible
6. The expected impact of ceiling fans on reducing my electric bill
7. The expected impact of ceilings fans on comfort level
8. Aesthetic value provided by fan
97. Other (Specify)
98. Don't know

81. Please indicate if you are very dissatisfied, dissatisfied, neither dissatisfied nor satisfied, satisfied, or very satisfied with the following aspects of the ceiling fan installation.

	VD	D	N	S	VS	DK
a. Rebate application process	1	2	3	4	5	98
b. Rebate dollar amount you received	1	2	3	4	5	98
c. Ceiling fans performance for saving energy	1	2	3	4	5	98
d. Ceiling fans performance for increasing comfort	1	2	3	4	5	98

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.Error! Reference source not found.-Error! Reference source not found.Error! Reference source not found.** = 1 or 2]

82. Why are you dissatisfied with the installation of the ceiling fans?

83. What was your approximate total out-of-pocket cost for the Energy Star qualified ceiling fan purchase?

RETROFIT RECOMMENDATIONS

84. Did the home energy auditor make recommendations for one or more of the following home improvements that you declined to pursue?

	Yes	No	DK
a. Attic Insulation	1	2	98
b. Wall insulation	1	2	98
c. Energy Star Qualified Windows	1	2	98
d. Duct Sealing	1	2	98
e. Energy Star Qualified Ceiling fan	1	2	98

85. Did the auditor recommend any retrofits other than those we just covered?
1. Yes
2. No

98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

86. What were the additional recommended retrofits?

87. Did you complete any of the additional retrofits?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

88. Which additional retrofits did you complete?

[DISPLAY ATTIC INSULLATION IF Q**Error! Reference source not found.**= 1]

ATTIC INSULATION

89. Why did you not install the recommended attic insulation? Was your decision related to:

	Yes	No	DK
The rebate offered was not enough of an incentive	1	2	98
Was not able to cover the out-of-pocket costs	1	2	98
Financing was not offered to fund the retrofit	1	2	98
Payback period for the investment was not attractive	1	2	98
Retrofit recommendation did not seem very credible	1	2	98
More attic insulation would not reduce my electric bill	1	2	98

90. Were there any other reasons for your decision to not install the recommended attic insulation?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

91. What other factors were important to your decision to not install the recommended attic insulation?

92. What would you say was the most important factor to your decision to not install the recommended attic insulation?
    1. The rebate offered was not enough of an incentive
    2. Was not able to cover the out-of-pocket costs
    3. Financing was not offered to fund the retrofit
    4. Payback period for the investment was not attractive
    5. Retrofit recommendation did not seem very credible
    6. More attic insulation would not reduce my electric bill
    97. Other (Specify)
    98. Don't know

[DISPLAY WALL INSULLATION IF Q**Error! Reference source not found.** = 1]

WALL INSULATION

93. Why did you not install the recommended wall insulation? Was your decision related to:

	Yes	No	DK
The rebate offered was not enough of an incentive	1	2	98
Was not able to cover the out-of-pocket costs	1	2	98
Financing was not offered to fund the retrofit	1	2	98
Payback period for the investment was not attractive	1	2	98
Retrofit recommendation did not seem very credible	1	2	98
More wall insulation would not reduce my electric bill	1	2	98

94. Were there any other reasons for your decision to not install the recommended wall insulation?
    1. Yes
    2. No
    98. Don't know

95. What other factors were important to your decision to not pursue the recommendation to seal the ducts in your home?

96. What would you say was the most important factor to your decision to not install the recommended wall insulation?
    1. The rebate offered was not enough of an incentive
    2. Was not able to cover the out-of-pocket costs
    3. Financing was not offered to fund the retrofit
    4. Payback period for the investment was not attractive
    5. Retrofit recommendation did not seem very credible
    6. More wall insulation would not reduce my electric bill
    97. Other (Specify)
    98. Don't know

[DISPLAY ENERGY STAR QUALIFIED WINDOWS IF Q**Error! Reference source not found.** = 1]

ENERGY STAR QUALIFIED WINDOWS

97. Why did you not install the Energy Star qualified windows? Was your decision related to:

	Yes	No	DK
The rebate offered was not enough of an incentive	1	2	98
Was not able to cover the out-of-pocket costs	1	2	98
Financing was not offered to fund the retrofit	1	2	98
Payback period for the investment was not attractive	1	2	98
Retrofit recommendation did not seem very credible	1	2	98
Energy Star qualified would not reduce my electric bill	1	2	98

98. Were there any other reasons for your decision to not install the recommended Energy Star qualified windows?
    1. Yes
    2. No
    98. Don't know

99. What other factors were important to your decision to not install the windows?

100. What would you say was the most important factor to your decision to not install the recommended wall insulation? (Do not read list; prompt if necessary)
    1. The rebate offered was not enough of an incentive

2. Was not able to cover the out-of-pocket costs
3. Financing was not offered to fund the retrofit
4. Payback period for the investment was not attractive
5. Retrofit recommendation did not seem very credible
6. Energy Star qualified windows would not reduce my electric bill
97. Other (Specify)
98. Don't know

[DISPLAY DUCT SEALING IF Q**Error! Reference source not found.**= 1]

DUCT SEALING

101. Why did you not pursue the recommendation to seal the ducts in your home? Was your decision related to:

	Yes	No	DK
The rebate offered was not enough of an incentive	1	2	98
Was not able to cover the out-of-pocket costs	1	2	98
Financing was not offered to fund the retrofit	1	2	98
Payback period for the investment was not attractive	1	2	98
Retrofit recommendation did not seem very credible	1	2	98
Energy Star qualified would not reduce my electric bill	1	2	98

102. Were there any other reasons for your decision to not pursue the recommendation to seal the ducts in your home?
1. Yes
2. No
98. Don't know

103. What other factors were important to your decision to not pursue the recommendation to seal the ducts in your home?

104. What would you say was the most important factor in your decision to not pursue the recommendation to seal the ducts in your home?
1. The rebate offered was not enough of an incentive
2. Was not able to cover the out-of-pocket costs
3. Financing was not offered to fund the retrofit

4. Payback period for the investment was not attractive
5. Retrofit recommendation did not seem very credible
6. Duct sealing would not reduce my electric bill
97. Other (Specify)
98. Don't know

[DISPLAY ENERGY STAR QUALIFIED CEILING FAN IF Q**Error! Reference source not found.** = 1]

ENERGY STAR QUALIFIED CEILING FAN

105. Why did you not install the recommended Energy Star ceiling fans? Was your decision related to:

	Yes	No	DK
The rebate offered was not enough of an incentive	1	2	98
Was not able to cover the out-of-pocket costs	1	2	98
Financing was not offered to fund the retrofit	1	2	98
Payback period for the investment was not attractive	1	2	98
Retrofit recommendation did not seem very credible	1	2	98
Ceiling fans would not reduce my electric bill	1	2	98

106. Were there any other reasons for your decision to not pursue the recommendation to install the ceiling fans?
1. Yes
2. No
98. Don't know

107. What other factors were important to your decision to not install the ceiling fans? (Do not read list; prompt if necessary)

108. What would you say was the most important factor to your decision to not install the ceiling fans?
1. The rebate offered was not enough of an incentive
2. Was not able to cover the out-of-pocket costs
3. Financing was not offered to fund the retrofit
4. Payback period for the investment was not attractive
5. Retrofit recommendation did not seem very credible

6. Ceiling fans would not reduce my electric bill
97. Other (Specify)
98. Don't know

[DISPLAY HOME DEMOGRAPHICS IF Q**Error! Reference source not found.**-**Error! Reference source not found.** = 2]

HOME DEMOGRAPHICS

109. Which of the following best describes your residence? (Read list)
1. Single-family home, detached construction
2. Single-family home, factory manufactured/modular
3. Mobile home
4. Row house
5. Two or Three family attached residence
6. Apartment with 4+ families
7. Condominium
97. Other (Specify)
98. Don't Know

110. Do you own or rent this residence?
1. Own
2. Rent
98. Don't Know

111. Approximately when was your residence built? (Read list)
1. Before 1960
2. 1960-1969
3. 1970-1979
4. 1980-1989
5. 1990-1999
6. 2000-2005
7. 2006 or Later
98. Don't know

112. About how much above-ground living space do you have in your residence? (Read list)
1. Less than 1,000 square feet
2. 1000-2000 square feet
3. 2000-3000 square feet

4. 3000-4000 square feet
5. 4000-5000 square feet
6. Greater than 5000 square feet
98. Don't know

113. About how much below-ground living space do you have in your residence? (Read list)
1. Less than 1,000 square feet
2. 1000-2000 square feet
3. 2000-3000 square feet
4. 3000-4000 square feet
5. 4000-5000 square feet
6. Greater than 5000 square feet
98. Don't know

114. Would you be interested in participating in a at home verification visit for a 20 dollar (Add Detail for the gift card) Shell gas online gift card?
1. Yes
2. No

Thank you for your time.
If you have any questions about this survey, please call ADM Associates
775-624-7999

9.2 Online Audit Survey Cohort 4

1. First, could you tell me how you heard about the Home Energy Analyzer?
    1. Bill Insert
    2. Energy Save Ohio website
    3. FirstEnergy Utility website
    4. Print/Newspaper Ad
    5. Radio
    6. Word-of-Mouth
    97. Other (Specify)

2. Our records indicate that you used the Home Energy Analyzer. Can you tell me why you decided to do an online home energy audit? What were your concerns?
    1. Investigate
    2. Financial (High Bills)
    3. Conserve Energy
    97. Other (Specify)
    98. Don't know

3. Can you tell me what you did online with the Home Energy Analyzer? Did you...
    1. Review changes in your bill/usage over time
    2. Answer questions about your home appliances
    3. Answer questions about weatherizing your home
    4. Get detailed energy saving ideas for your home
    5. Do something else
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 5]

4. Can you specify "something else"?

5. What kind of detailed energy saving ideas did you receive? Did they involve:
    1. No-cost /low cost ways to save energy immediately?
    2. Ways to save requiring investment but will pay off?
    3. Ways to save that would not be cost-justified?
    97. Other (Specify)

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 4]

6. Can you specify the "other ways to save"?

7. How helpful was the information provided by the Home Energy Analyzer? Would you say it was:
   1. Very Helpful
   2. Somewhat Helpful
   3. Neither Helpful nor Unhelpful
   4. Somewhat Unhelpful
   5. Not at all Helpful
   98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 4 or 5]

8. What aspects were not helpful? Why?

9. What aspect of the Home Energy Analyzer was most helpful to you? Why?

10. What energy saving actions were you able to take, if any, as a result of using the Home Energy Analyzer?
    1. Structural changes (e.g. replace an appliance with one that is more energy efficient)
    2. Behavioral changes (turn off the lights when leaving a room, adjust the thermostat before leaving the house)
    3. Both structural and behavioral changes taken
    4. No changes made yet
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1 or 3]

11. I made structural changes to my...
    1. Appliance
    2. HVAC
    3. Lighting
    4. Water heating measures
    97. Other (Specify)

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2 or 3]

12. I made behavioral changes to my...
    1. Appliance
    2. HVAC
    3. Lighting
    4. Water heating measures
    97. Other (Specify)

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2 or 3]

13. Do you do things differently now to save energy in hot weather?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.**=1]

14. What do you do differently now?

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2 or 3]

15. Do you do things differently now to save energy in cold weather?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

16. What do you do differently now?

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2 or 3]

17. Have you noticed any savings on your electric bill since you made these changes?
    1. Yes, my electric bill has decreased
    2. No, there does not seem to be a change in my electric bill
    3. Not sure or too soon to tell
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

18. How satisfied are you with the savings you noticed on your electric bill since making these changes? Would you say you are:
    1. Very satisfied
    2. Somewhat satisfied
    3. Neither satisfied nor dissatisfied
    4. Somewhat dissatisfied
    5. Very dissatisfied
    98. Don't know

19. Overall, how satisfied are you with the Home Energy Audit Program? Would you say you are:
    1. Very satisfied
    2. Somewhat satisfied
    3. Neither satisfied nor dissatisfied
    4. Somewhat dissatisfied
    5. Very dissatisfied
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 4 or 5]

20. Why do you give it that rating?

21. Do you have any suggestions for improving the Home Energy Analyzer?

22. Which of the following best describes your home?
    1. Single-family home, detached construction
    2. Single-family home, factory manufactured/modular
    3. Mobile home
    4. Row house
    5. Two or Three family attached residence
    6. Apartment with 4+ families
    7. Condominium
    97. Other (Specify)
    98. Don't know

23. Do you own or rent this residence?

1. Own
2. Rent
98. Don't know

24. Approximately when was your home built?
    1. Before 1960
    2. 1960-1969
    3. 1970-1979
    4. 1980-1989
    5. 1990-1999
    6. 2000-2005
    7. 2006 or Later
    98. Don't know

25. Would you estimate the above-ground living space is about:
    1. Less than 1,000 square feet
    2. 1,000-2,000 square feet
    3. 2,000-3,000 square feet
    4. 3,000-4,000 square feet
    5. 4,000-5,000 square feet
    6. Greater than 5,000 square feet
    98. Don't know

26. Do you have any below-ground living space like a converted basement?
    1. Yes
    2. No
    98. Don't know

[DISPLAY QError! Reference source not found. IF QError! Reference source not found. = 1]

27. Would you estimate the below-ground living space is about:
    1. Less than 1,000 square feet
    2. 1,000-2,000 square feet
    3. 2,000-3,000 square feet
    4. 3,000-4,000 square feet
    5. 4,000-5,000 square feet
    6. Greater than 5,000 square feet
    98. Don't know

9.3 Phone Audit Survey Cohort 4

1. Can you tell me why you called the Customer Service Center? What were your concerns?
    1. High Bill Complaint
    97. Other (Specify)
    98. Don't Know

2. What did the Customer Service Center Representative discuss with you?
    1. Review changes in your bill/usage over time
    2. Answer questions about your home appliances?
    3. Find out about your top 3 home energy uses?
    4. Get offered literature about saving energy at home?
    5. Discuss something else?
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 5]

3. Can you specify "something else"?

4. How helpful was the information provided over the phone?
    1. Very Helpful
    2. Somewhat Helpful
    3. Neither Helpful nor Unhelpful
    4. Somewhat Unhelpful
    5. Not at all Helpful
    98. Don't know

5. What aspects of the phone conversation with Customer Service were not helpful? Why? (ex: did the conversation provide you new or actionable info?)

6. Did the Customer Service Representative send you any of the following?
    1. Brochure(s) on Energy Savings Tips
    2. Pack of 6 Energy-Saving CFL Light Bulbs
    3. PC Link to Home Energy Analyzer software
    4. Nothing was sent
    97. Other (Specify)

7. How helpful were the Energy Saving Tips? Would you say...
    1. Very Helpful
    2. Somewhat Helpful
    3. Neither Helpful nor Unhelpful
    4. Somewhat Unhelpful
    5. Not at all Helpful

98. Don't Know

8. How many of the CFL light bulbs have you installed?
    1. Number of CFLs installed:
    98. Don't Know

9. Have you viewed the Energy Analyzer from the link that was sent to you? If so, have you used it?
    1. Yes, I viewed but have not used it:
    2. Yes, I have viewed it and I have used it
    3. No, I have not viewed it
    98. Don't Know

10. What energy saving actions were you able to take, if any, as a result of your telephone call to the Customer Service Center? Did you start doing things differently to save energy or did you have new high efficiency energy saving equipment installed in your home?
    1. Structural changes (e.g. replace an appliance with one that is more energy efficient)
    2. Behavioral changes (e.g. turn off lights when leaving a room, adjust thermostat before leaving the house)
    3. Both structural and behavioral changes made
    4. No energy saving changes made
    98. Don't know

11. What structural (equipment) changes were made?
    1. Appliance
    2. HVAC
    3. Lighting
    4. Water heating measures
    97. Other (Specify)

12. What behavioral changes were made?
    1. Appliance
    2. HVAC
    3. Lighting
    4. Water heating measures
    97. Other (Specify)

13. Do you do things differently now to save energy in hot weather?
    1. Yes
    2. No
    98. Don't know

14. What do you do differently now?

15. Do you do things differently now to save energy in cold weather?
    1. Yes
    2. No
    98. Don't know

16. What do you do differently now?

17. Have you noticed any savings on your electric bill since you made these changes?
    1. Yes, my electric bill has decreased
    2. No, there does not seem to be a change in my electric bill
    3. Not sure or too soon to tell
    98. Don't know

18. How satisfied are you with the savings you noticed on your electric bill since making these changes? Would you say you are:
    1. Very satisfied
    2. Somewhat satisfied
    3. Neither satisfied nor dissatisfied
    4. Somewhat dissatisfied
    5. Very dissatisfied
    98. Don't know

19. Overall, how satisfied are you with the Analysis performed by the Customer Service Center? Would you say you are:
    1. Very satisfied
    2. Somewhat satisfied
    3. Neither satisfied nor dissatisfied
    4. Somewhat dissatisfied
    5. Very dissatisfied
    98. Don't know

20. Why do you give it that rating?

21. Do you have any suggestions to improve the Analysis process?
    1. Yes
    2. No
    98. Don't know

22. What are your suggestions for improving the Analysis process?

23. Which of the following best describes your home?
    1. Single-family home, detached construction
    2. Single-family home, factory manufactured/modular
    3. Mobile home
    4. Row house
    5. Two or Three family attached residence
    6. Apartment with 4+ families
    7. Condominium
    97. Other (Specify)
    98. Don’t know

24. Would you please specify "other"?

25. Do you own or rent this residence?
    1. Own
    2. Rent
    98. Don't know

26. Approximately when was your home built?
    1. Before 1960
    2. 1960-1969
    3. 1970-1979
    4. 1980-1989
    5. 1990-1999
    6. 2000-2005
    7. 2006 or Later
    98. Don’t know
    99. Refused

27. Would you estimate the above-ground living space is about:
    1. Less than 1,000 square feet
    2. 1,000-2,000 square feet
    3. 2,000-3,000 square feet
    4. 3,000-4,000 square feet
    5. 4,000-5,000 square feet
    6. Greater than 5,000 square feet
    98. Don't know

28. Do you have any below-ground living space like a converted basement?
    1. Yes
    2. No
    98. Don't know

29. Would you estimate the below-ground living space is about:

1. Less than 1,000 square feet
2. 1,000-2,000 square feet
3. 2,000-3,000 square feet
4. 3,000-4,000 square feet
5. 4,000-5,000 square feet
6. Greater than 5,000 square feet

98. Don't know

Thank you!

9.4 Online Audit Survey Cohorts 1-3

1. First, could you tell me how you heard about the Home Energy Analyzer?
    1. Bill Insert
    2. Energy Save Ohio website
    3. FirstEnergy Utility website
    4. Print/Newspaper Ad
    5. Radio
    6. Word-of-Mouth
    97. Other (Specify)

2. Our records indicate that you used the Home Energy Analyzer. Can you tell me why you decided to do an online home energy audit? What were your concerns?
    1. Investigate
    2. Financial (High Bills)
    3. Conserve Energy
    97. Other (Specify)
    98. Don't know

3. Can you tell me what you did online with the Home Energy Analyzer? Did you...
    1. Review changes in your bill/usage over time
    2. Answer questions about your home appliances
    3. Answer questions about weatherizing your home
    4. Get detailed energy saving ideas for your home
    5. Do something else
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 5]

4. Can you specify "something else"?

5. If you did not complete the entire online audit, what made you stop at the location you did?
    1. Completed the entire survey
    2. Was satisfied with the results
    3. Ran out of time
    4. Further improvements out of budget

6. What kind of detailed energy saving ideas did you receive? Did they involve:
    1. No-cost /low cost ways to save energy immediately?
    2. Ways to save requiring investment but will pay off?
    3. Ways to save that would not be cost-justified?
    97. Other

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 4]

7. Can you specify the "other ways to save"?

8. How helpful was the information provided by the Home Energy Analyzer?
    1. Very Helpful
    2. Somewhat Helpful
    3. Neither Helpful nor Unhelpful
    4. Somewhat Unhelpful
    5. Not at all Helpful
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 4 or 5]

9. What aspects were not helpful? Why?

10. What aspect of the Home Energy Analyzer was most helpful to you? Why?

11. What energy saving actions were you able to take, if any, as a result of using the Home Energy Analyzer?
    1. Structural changes (e.g. replace an appliance with one that is more energy efficient)
    2. Behavioral changes (turn off the lights when leaving a room, adjust the thermostat before leaving the house)
    3. Both structural and behavioral changes taken
    4. No changes made yet
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1 or 3]

12. I made structural changes to my...
    1. Appliance
    2. HVAC
    3. Lighting
    4. Water heating measures
    97. Other (Specify)

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2 or 3]

13. I made behavioral changes to my...
    1. Appliance
    2. HVAC
    3. Lighting
    4. Water heating measures

97. Other (Specify)

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1 or 3]
14. Is the equipment/materials that you purchased still installed?
    1. Yes, it's still installed
    2. No, I removed it/took it out
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]
15. How satisfied are you with your new equipment/materials?
    1. Very satisfied
    2. Somewhat satisfied
    3. Neither satisfied nor dissatisfied
    4. Somewhat dissatisfied
    5. Very dissatisfied
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2 or 3]
16. Do you do things differently now to save energy in hot weather?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]
17. What do you do differently now?

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2 or 3]
18. Do you do things differently now to save energy in cold weather?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]
19. What do you do differently now?

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2 or 3]
20. Are you continuing to do the behavioral changes you identified?
    1. Yes, behavior still practiced
    2. No, I stopped doing that

98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.**= 2 or 3]

21. Have you noticed any savings on your electric bill since you made these changes?
    1. Yes, my electric bill has decreased
    2. No, there does not seem to be a change in my electric bill
    3. Not sure or too soon to tell
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

22. How satisfied are you with the savings you noticed on your electric bill since making these changes?
    1. Very satisfied
    2. Somewhat satisfied
    3. Neither satisfied nor dissatisfied
    4. Somewhat dissatisfied
    5. Very dissatisfied
    98. Don't know

23. Overall, how satisfied are you with the Home Energy Audit Program? Would you say you are:
    1. Very satisfied
    2. Somewhat satisfied
    3. Neither satisfied nor dissatisfied
    4. Somewhat dissatisfied
    5. Very dissatisfied
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 4 or 5]

24. Why do you give it that rating?
25. Do you have any suggestions to improve the Home Energy Analyzer?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

26. What are your suggestions for improving the Home Energy Analyzer?
27. Which of the following best describes your home?
    1. Single-family home, detached construction
    2. Single-family home, factory manufactured/modular
    3. Mobile home

4. Row house
5. Two or Three family attached residence
6. Apartment with 4+ families
7. Condominium
97. Other (Specify)
98. Don't know

28. Do you own or rent this residence?
    1. Own
    2. Rent
    98. Don't know

29. Approximately when was your home built?
    1. Before 1960
    2. 1960-1969
    3. 1970-1979
    4. 1980-1989
    5. 1990-1999
    6. 2000-2005
    7. 2006 or Later
    98. Don't know

30. Would you estimate the above-ground living space is about:
    1. Less than 1,000 square feet
    2. 1,000-2,000 square feet
    3. 2,000-3,000 square feet
    4. 3,000-4,000 square feet
    5. 4,000-5,000 square feet
    6. Greater than 5,000 square feet
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

31. Do you have any below-ground living space like a converted basement?
    1. Yes
    2. No
    98. Don't know

32. Would you estimate the below-ground living space is about:
    1. Less than 1,000 square feet
    2. 1,000-2,000 square feet
    3. 2,000-3,000 square feet
    4. 3,000-4,000 square feet
    5. 4,000-5,000 square feet

6. Greater than 5,000 square feet
98. Don't know

9.5 Phone Audit Survey Cohorts 1-3

1. Our records indicate that you called the Customer Service Center. Can you tell me why you called the Customer Service Center? What were your concerns?
    2. High Bill Complaint
    3. Other (Specify)
    4. Don't Know

2. What other reasons did you call the customer service center?
    1. Investigate
    2. Financial (high bills)
    3. Conserve Energy
    4. Meter
    5. Power Outage
    97. Other (Specify)

3. What did the Customer Service Center Representative discuss with you?
    6. Review changes in your bill/usage over time
    7. Answer questions about your home appliances?
    8. Find out about your top 3 home energy uses?
    9. Get offered literature about saving energy at home?
    10. Discuss something else?
    98. Don’t know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 5]

4. Can you specify "something else"?

5. How helpful was the information provided over the phone? Would you say it was...
    6. Very Helpful
    7. Somewhat Helpful
    8. Neither Helpful nor Unhelpful
    9. Somewhat Unhelpful
    10. Not at all Helpful
    98. Don't know

[DISPLAY QError! Reference source not found. IF QError! Reference source not found. = 4 or 5]

6. What aspects of the phone conversation with Customer Service were not helpful? Why? (ex: Did the conversation provide you new or actionable info?)

7. Did the Customer Service Representative send you any of the following?
    5. Brochure(s) on Energy Savings Tips
    6. Pack of 6 Energy-Saving CFL Light Bulbs
    7. PC Link to Home Energy Analyzer software
    8. Nothing was sent
    97. Other (Specify)

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

8. How helpful were the Energy Saving Tips? Would you say...
    6. Very Helpful
    7. Somewhat Helpful
    8. Neither Helpful nor Unhelpful
    9. Somewhat Unhelpful
    10. Not at all Helpful
    98. Don't Know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2]

9. How many of the CFL light bulbs have you installed?
    1. Number of CFLs installed:
    98. Don't Know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2]

10. Have you viewed the Online Energy Analyzer from the link that was sent to you? If so, have you used it?
    4. Yes, I viewed but have not used it:
    5. Yes, I have viewed it and I have used it
    6. No, I have not viewed it
    98. Don't Know

11. What energy saving actions were you able to take, if any, as a result of your telephone call to the Customer Service Center? Did you start doing things differently to save energy or did you have new high efficiency energy saving equipment installed in your home?
    5. Structural changes (e.g. replace an appliance with one that is more energy efficient)
    6. Behavioral changes (e.g. turn off lights when leaving a room, adjust thermostat before leaving the house)
    7. Both structural and behavioral changes made
    8. No energy saving changes made
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2 or 3]

12. I made behavioral changes to my...
    5. Appliance
    6. HVAC
    7. Lighting
    8. Water heating measures
    97. Other (Specify)

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1 or 3]

13. I made structural changes to my...
    5. Appliance
    6. HVAC
    7. Lighting
    8. Water heating measures
    97. Other (Specify)

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1 or 3]

14. How is that working out? Is the equipment/materials that you purchased still installed?
    1. Yes, it's still installed
    2. No, I removed it/took it out
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

15. How satisfied are you with your new equipment/materials?
    1. Very satisfied
    2. Somewhat satisfied
    3. Neither satisfied nor dissatisfied
    4. Somewhat dissatisfied
    5. Very dissatisfied
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2 or 3]

16. Do you do things differently now to save energy in hot weather?
    3. Yes
    4. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

17. What do you do differently now?

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2 or 3]

18. Do you do things differently now to save energy in cold weather?
    3. Yes
    4. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

19. What do you do differently now?

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2 or 3]

20. Are you continuing to do the behavioral changes you identified?
    1. Yes, behavior still practiced
    2. No, I stopped doing that
    98. Don't know

[DISPLAY QError! Reference source not found. IF QError! Reference source not found. = 2 or 3]

21. Have you noticed any savings on your electric bill since you made these changes?
    4. Yes, my electric bill has decreased
    5. No, there does not seem to be a change in my electric bill
    6. Not sure or too soon to tell
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

22. How satisfied are you with the savings you noticed on your electric bill since making these changes?
    6. Very satisfied
    7. Somewhat satisfied
    8. Neither satisfied nor dissatisfied
    9. Somewhat dissatisfied
    10. Very dissatisfied
    98. Don't know

23. Overall, how satisfied are you with the Analysis performed by the Customer Service Center?

6. Very satisfied
7. Somewhat satisfied
8. Neither satisfied nor dissatisfied
9. Somewhat dissatisfied
10. Very dissatisfied
98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 4 or 5]

24. Why do you give it that rating?

25. Do you have any suggestions to improve the Analysis process?
    3. Yes
    4. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

26. What are your suggestions for improving the Analysis process?

27. Which of the following best describes your home?
    8. Single-family home, detached construction
    9. Single-family home, factory manufactured/modular
    10. Mobile home
    11. Row house
    12. Two or Three family attached residence
    13. Apartment with 4+ families
    14. Condominium
    97. Other (Specify)
    98. Don’t know

[DISPLAY Q28 IF Q27 = 1]

28. Would you please specify "other"?

29. Do you own or rent this residence?
    3. Own
    4. Rent
    98. Don't know

30. Approximately when was your home built?
    8. Before 1960
    9. 1960-1969
    10. 1970-1979
    11. 1980-1989

12. 1990-1999
13. 2000-2005
14. 2006 or Later
98. Don’t know
99. Refused

31. Would you estimate the above-ground living space is about:
    7. Less than 1,000 square feet
    8. 1,000-2,000 square feet
    9. 2,000-3,000 square feet
    10. 3,000-4,000 square feet
    11. 4,000-5,000 square feet
    12. Greater than 5,000 square feet
    98. Don't know

32. Do you have any below-ground living space like a converted basement?
    3. Yes
    4. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

33. Would you estimate the below-ground living space is about:
    7. Less than 1,000 square feet
    8. 1,000-2,000 square feet
    9. 2,000-3,000 square feet
    10. 3,000-4,000 square feet
    11. 4,000-5,000 square feet
    12. Greater than 5,000 square feet
    98. Don't know

9.6 Home Energy Audit Control Survey

Q1. Hello. I am calling on behalf of [NAME OF EDC], your electric utility company. You have been randomly selected to participate in this survey about your experience saving energy with [NAME OF EDC]. You will receive a $5 gas card from Shell for participating in this survey. Is now a good time to talk with you? This will only take a few minutes.

1. Yes [PROCEED WITH INTERVIEW]
2. No [THANK AND TERMINATE]
3. Refused [THANK AND TERMINATE]

1. Did you participate in any of the following (NAME OF EDC) residential energy saving programs in 2013 that could help save you money? These include:

	Yes	No	DK	Refused
a. CFL Retail Program	1	2	98	99
b. Residential Energy Audit Program	1	2	98	99
c. Easy Cool Rewards Program	1	2	98	99
d. Energy Efficient Products Program	1	2	98	99
e. Appliance Turn-In Program	1	2	98	99
f. Community Connections Program	1	2	98	99
g. Behavioral Modification Program	1	2	98	99

2. Have you taken any of the following energy saving steps this year? Have you:

	Yes	No	DK	Refused
1. Purchased any CFLs	1	2	98	99
2. Added insulation to your home	1	2	98	99
3. Tuned up your central AC system	1	2	98	99
4. Installed a high efficiency central AC system	1	2	98	99
5. Installed a new high efficiency heat pump	1	2	98	99
6. Installed Energy Star windows	1	2	98	99
7. Installed a programmable thermostat	1	2	98	99
8. Had a residential energy audit performed	1	2	98	99
9. Purchased Energy Star home appliances[68]	1	2	98	99

[68] Includes Energy Star rated clothes washers, refrigerators, room AC units, dehumidifiers as well as energy saving surge protectors and torchiere floor lamps.

3. Have you taken any other energy saving steps this year?
    1. Yes
    2. No
    98. Don't know
    99. Refused

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

4. Please describe what other energy saving steps you did this year. (Record verbatim response)

5. Are you doing anything in particular this year to save energy in hot weather?
    1. Yes
    2. No
    98. Don't know
    99. Refused

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

6. What do you do? (Record verbatim response)

7. Are you doing anything in particular this year to save energy in cold weather?
    1. Yes
    2. No
    98. Don't know
    99. Refused

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

8. What do you do? (Record verbatim response)

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

9. Have you noticed any savings on your electric bill since you made these changes?
    1. Yes, my electric bill has decreased
    2. No, there does not seem to be a change in my electric bill
    3. Not sure or too soon to tell
    98. Don't know
    99. Refused

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

10. How satisfied are you with the savings you noticed on your electric bill since making these changes? Would you say you were Very Satisfied, Somewhat Satisfied, Neither Satisfied nor Dissatisfied, Somewhat Dissatisfied, or Very Dissatisfied?
    1. Very satisfied
    2. Somewhat satisfied
    3. Neither satisfied nor dissatisfied
    4. Somewhat dissatisfied
    5. Very dissatisfied
    98. Don't know
    99. Refused

I'd like to finish up by asking you some questions about your home.

11. Which of the following best describes your home? (Read list option 1-7)
    1. Single-family home, detached construction
    2. Single-family home, factory manufactured/modular
    3. Mobile home
    4. Row house
    5. Two or Three family attached residence
    6. Apartment with 4+ families
    7. Condominium
    97. Other (Specify)
    98. Don't Know
    99. Refused

12. Do you own or rent this residence?
    1. Own
    2. Rent
    98. Don't Know
    99. Refused

13. Approximately when was your home built? (Do not read list)
    1. Before 1960
    2. 1960-1969
    3. 1970-1979
    4. 1980-1989
    5. 1990-1999
    6. 2000-2005
    7. 2006 or Later

98. Don’t know
99. Refused

14. Would you estimate the above-ground living space is about:
    1. Less than 1,000 square feet
    2. 1000-2000 square feet
    3. 2000-3000 square feet
    4. 3000-4000 square feet
    5. 4000-5000 square feet
    6. Greater than 5000 square feet
    98. Don’t know
    99. Refused

15. Do you have any below-ground living space such as a converted basement?
    1. Yes
    2. No
    98. Don’t know
    99. Refused

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

16. Would you estimate the below-ground living space is about:
    1. Less than 1,000 square feet
    2. 1000-2000 square feet
    3. 2000-3000 square feet
    4. 3000-4000 square feet
    5. 4000-5000 square feet
    6. Greater than 5000 square feet
    98. Don’t know
    99. Refused

That’s all the questions I have. Thank you for your time. Good bye.

10. Appendix C: Energy Conservation Kits Reference Materials and Survey Instruments

10.1 Application, Marketing, and Kit Literature

FirstEnergy Energy Conservation Kit Program

FirstEnergy has contracted with Power Direct Energy to administer this program. Power Direct Energy maintains this site and its content. To request a kit over the phone, call 1-888-257-2838. For assistance with signing up for a kit online, please contact a Power Direct Energy program representative at 1-888-225-8996, Monday-Friday between the hours of 9am-7pm EST.

Ohio residential customers of The Illuminating Company, Ohio Edison and Toledo Edison are now eligible to receive an energy conservation kit. **You will not be charged separately for this kit.** The kit includes nine compact fluorescent light bulbs (CFLs), a smart strip/surge protector, a furnace filter whistle, and two LED night lights.** Click here to learn more about the cost of this kit.

To complete your enrollment in the Energy Conservation Kit program and receive your kit, please complete the fields below. If you received a postcard, you can use the invitation code listed above your name to enroll. **If you do not have an invitation code, you will need to provide your 12 digit account number**, which can be found on the upper right hand corner of your electric bill.

Invitation Code: * or Account #: * (do not include any dashes or spaces)

Contact Name: * First Last

Email Address:

Confirm Email:

Phone Number: * ### - ### - ####

ZIP Code: *

Water Heating Fuel: * —Select— Non-electric water heating fuel includes natural gas, oil, propane, wood and other.

Heating Fuel: * —Select— Non-electric heating fuel includes natural gas, oil, propane, wood and other.

Referral Source: * —None—

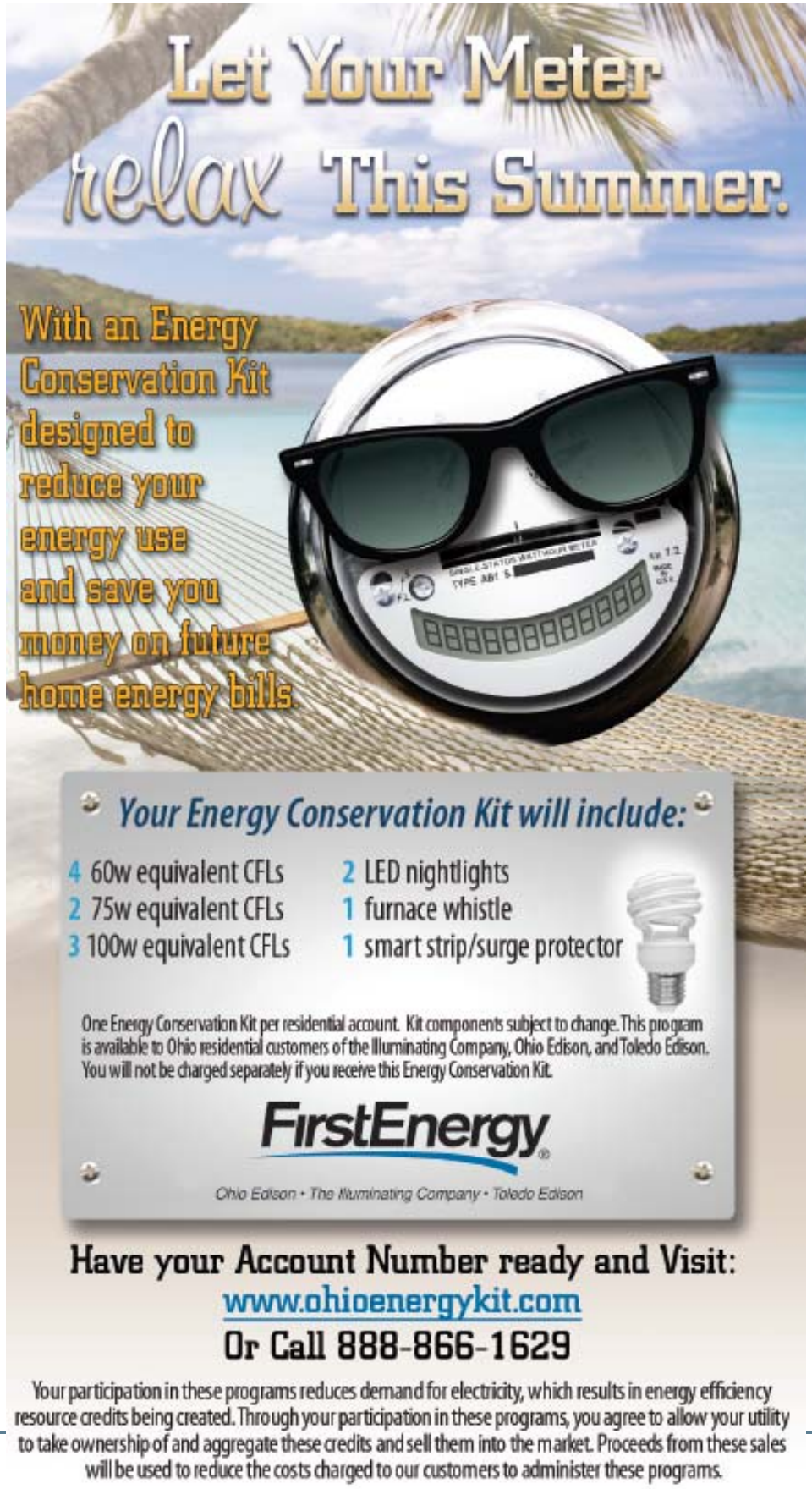
Shipping Information

The kit may be shipped to your mailing address (where your bill is sent), service address (the location where you receive your electricity) or an alternative address. Please select where you would like the kit to be shipped. Note that the kit can only be shipped to addresses in the state of Ohio.

- (•) Mailing Address
- ( ) Service Address
- ( ) Other

**One Energy Conservation Kit per residential account.

Clear Form Submit Request


Let Your Meter relax This Summer.
With an Energy Conservation Kit designed to reduce your energy use and save you money on future home energy bills.
Your Energy Conservation Kit will include:
4 60w equivalent CFLs
2 75w equivalent CFLs
3 100w equivalent CFLs
2 LED nightlights
1 furnace whistle
1 smart strip/surge protector
One Energy Conservation Kit per residential account. Kit components subject to change. This program is available to Ohio residential customers of the Illuminating Company, Ohio Edison, and Toledo Edison. You will not be charged separately if you receive this Energy Conservation Kit.
FirstEnergy
Ohio Edison • The Illuminating Company • Toledo Edison
Have your Account Number ready and Visit:
www.ohioenergykit.com
Or Call 888-866-1629
Your participation in these programs reduces demand for electricity, which results in energy efficiency resource credits being created. Through your participation in these programs, you agree to allow your utility to take ownership of and aggregate these credits and sell them into the market. Proceeds from these sales will be used to reduce the costs charged to our customers to administer these programs.


DON'T FORGET TO INSTALL YOUR CFL BULBS AND LED NIGHTLIGHTS
Replace incandescent bulbs with your new CFLs in lamps that you use frequently, 3 to 4 hours a day. Do not install these CFLs in dimmers or 3-way lamps.
Plug your LED nightlights directly into wall outlets and the sensors automatically turn them on and off depending on whether or not other light is present.
For further installation instructions, please call 1-888-225-8996.
The costs of energy efficiency programs are recovered through residential customer rates in accordance with Ohio Senate Bill 221. FirstEnergy's utilities do not provide a warranty or endorse any manufacturer or product. Your participation in these programs reduces demand for electricity, which results in energy efficiency resource credits being created. Through your participation in these programs, you agree to allow your utility to take ownership of and aggregate these credits and sell them into the market. Proceeds from these sales will be used to reduce the costs charged to our customers to administer these programs.


A friendly reminder from me, your meter…
Make me happy by installing all of the components you received in your Energy Conservation Kit!
Proud to be an ENERGY EFFICIENT HOME
TIPS FOR INSTALLING YOUR SMART POWER STRIP
Here are some ways to get the best use out of your smart power strip.
Master Outlet - TV or desktop computer
Controlled Outlet - DVD player, speakers, computer monitor or printer
Always-On Outlet - Cable box or modem
The devices in the "Controlled" outlets will only turn on if your "Master" device is turned on.
Experts say that standby power consumption (i.e., devices plugged in but not in use) accounts for up to 10 percent of your household energy bill.
By eliminating the use of standby power, you can save money and energy!
FirstEnergy
Ohio Edison • The Illuminating Company • Toledo Edison

10.2 Direct Mail Kits Participation Survey

1. According to our records, you received an Energy Conservation Kit supplied by FirstEnergy's Ohio Utilities. Is that correct?
   1. Yes
   2. No [THANK AND TERMINATE INTERVIEW]

2. Did you receive a mailer around the second week of December from FirstEnergy's Ohio Utilities that outlined how to correctly install a smart power strip, CFL bulbs, and LED nightlights?
   1. Yes
   2. No

3. Does your home have an electric water heater or a gas water heater?
   1. Electric water heater
   2. Non-electric water heater

4. Did you receive a postcard about FirstEnergy's Ohio utilities' Energy Conservation Kit program with an invitation code in the mail?
   1. Yes
   2. No
   98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

5. Was this how you first learned about FirstEnergy's Ohio Utilities' Energy Conservation Kit Program?
   1. Yes
   2. No
   98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2 or 98 or Q**Error! Reference source not found.** = 2]

6. How did you first hear about FirstEnergy's Ohio Utilities' Energy Conservation Kit Program? (Select all that apply)
   1. Received information in mail
   2. Read newspaper or magazine article
   3. Referred by friend/family
   4. TV Commercial
   5. FirstEnergy's Ohio Utilities' Bill message/ Bill insert
   6. FirstEnergy's Ohio Utilities' website
   7. FirstEnergy's Ohio Utilities' telephone representative
   8. Through a program at my child's school
   97. Other (Specify)

7. How did you request the kit?

1. Online
2. Telephone
98. Don't know

8. Was it easy to find the sign up screen to request the kit?
    1. Yes
    2. No
    98. Don't know

9. Did the website answer all of your questions about the kit?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2]

10. What questions were not answered by the website?

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2]

11. Was the representative you spoke to on the telephone polite and courteous?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2]

12. Did the representative answer all of your questions about the program?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2]

13. What question or questions was the representative unable to answer?

14. Approximately how many weeks did it take to receive the kit after you requested it?

15. How satisfied or dissatisfied were you with the time it took to receive the kit?
    1. Very satisfied
    2. Satisfied
    3. Neither Satisfied nor dissatisfied
    4. Dissatisfied
    5. Very dissatisfied

98. Don't know

16. Who is the primary decision-maker in your household when it comes to home energy issues?
    1. Me
    2. My spouse/domestic partner/significant other
    3. Someone else (Specify)

17. Did you receive 13W (60W Equivalent) CFLs in your Energy Conservation Kit? Example shown below. The actual item may have a slightly different appearance or it may be from a different manufacture. [IMAGE OF CFL BULB]
    1. Yes
    2. No

18. Did you receive 20W (75W Equivalent) CFLs in your Energy Conservation Kit? Example shown below. The actual item may have a slightly different appearance or it may be from a different manufacture. [IMAGE OF CFL BULB]
    1. Yes
    2. No

19. Did you receive 26W (100W Equivalent) CFLs in your Energy Conservation Kit? Example shown below. The actual item may have a slightly different appearance or it may be from a different manufacture. [IMAGE OF CFL BULB]
    1. Yes
    2. No

20. Did you receive a LED Night Light in your Energy Conservation Kit? Example shown below. The actual item may have a slightly different appearance or it may be from a different manufacture. [IMAGE OF NIGHT LIGHT]
    1. Yes
    2. No

21. Did you receive a furnace whistle in your Energy Conservation Kit? Example shown below. The actual item may have a slightly different appearance or it may be from a different manufacture. [IMAGE OF FURNACE WHISTLE]
    1. Yes
    2. No

22. Did you receive a 7 Plug Smart Strip in your Energy Conservation Kit? Example shown below. The actual item may have a slightly different appearance or it may be from a different manufacture. [IMAGE OF 7 PLUG SMART STRIP]
    1. Yes
    2. No

23. Did you receive faucet aerators in your Energy Conservation Kit? Example shown below. The actual item may have a slightly different appearance or it may be from a different manufacture. [IMAGE OF FAUCET AERATOR]

1. Yes
2. No

24. Did you receive a showerhead in your Energy Conservation Kit in your Energy Conservation Kit? Example shown below. The actual item may have a slightly different appearance or it may be from a different manufacture. [IMAGE OF SHOWERHEAD]
    1. Yes
    2. No

25. Were any of the kit items broken or not working when you received them?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

26. Did you contact any one about the items that were broken or not working?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

27. Who did you contact?

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

28. Was the item replaced?
    1. Yes
    2. No
    98. Don't know

ELECTRIC WATER HEATER KITS

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

29. At the time when you requested the kit, did you know that each of the follow would be included in the kit?

	Yes	No	Don't know
CFLs	( )	( )	( )
Smart Strip	( )	( )	( )

Faucet aerators	( )	( )	( )
LED night lights	( )	( )	( )
Energy efficient showerhead	( )	( )	( )

30. When you received the Energy Conservation Kit containing CFL light bulbs and other energy efficient products, did you install any of these products?
    1. Yes
    2. No

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2]

31. Why didn't you install any of the items in the Energy Conservation Kit?
    1. I didn't like any of the products
    2. I haven't had time yet
    3. I gave the entire kit to someone else
    97. Other reason (Specify)

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

32. Did you install the SMART POWER STRIP provided in the Energy Conservation Kit?
    1. Yes
    2. No

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

33. What appliances did you connect to the Smart Power Strip? (DROP DOWN LIST OF 31 HOUSEHOLD APPLIANCE CHOICES)
    Outlet #1 – Master circuit
    Outlet #2 – Controlled outlet
    Outlet #3 – Controlled outlet
    Outlet #4 – Controlled outlet
    Outlet #5 – Controlled outlet
    Outlet #6 – Always on
    Outlet #7 – Always on

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2]

34. Why didn't you install any of the Smart Power Strip?
    1. Already have power strips installed
    2. Did not understand how to install it
    3. Don't like the look of it

4. I have no appropriate use for it
97. Other (Specify)

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

35. If you installed any of the CFL LIGHT BULBS provided in the Energy Conservation Kit, please indicate the different types you installed.
    1. 13 watt (60 watt equivalent)
    2. 20 watt (75 watt equivalent)
    3. 26 watt (100 watt equivalent)
    4. I did not install and of the bulbs included in the Energy Conservation Kit

[DISPLAY Q**Error! Reference source not found.** and Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

36. How many of the 13 Watt (60 Watt Equivalent) Spiral CFL Bulbs did you install (up to a maximum of 4 bulbs)?

37. For the 13W bulbs that you installed, where did you install these bulbs? Please enter the number of bulbs you installed in each location.
    1. Living room
    2. Bathroom
    3. Kitchen
    4. Outdoors
    5. Family Room
    6. Bedroom
    7. Garage
    8. Hallway
    9. Office
    10. Laundry Room
    11. Dining Room
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** and Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2]

38. How many of the 20 Watt (75 Watt Equivalent) Spiral CFL Bulbs did you install (up to a maximum of 2 bulbs)?

39. Which room did you install the 20 W CFL in?
    1. Living room
    2. Bathroom
    3. Kitchen
    4. Outdoors
    5. Family Room
    6. Bedroom

7. Garage
8. Hallway
9. Office
10. Laundry Room
11. Dining Room
98. Don't know

[DISPLAY Q**Error! Reference source not found.** and Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 3]

40. How many of the 26 Watt (100 Watt Equivalent) Spiral CFL Bulbs did you install (up to a maximum of 32 bulbs)?

41. Which room did you install the 26 W CFL in?
    1. Living room
    2. Bathroom
    3. Kitchen
    4. Outdoors
    5. Family Room
    6. Bedroom
    7. Garage
    8. Hallway
    9. Office
    10. Laundry Room
    11. Dining Room
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1, 2, or 3]

42. If you did not install ALL of the CFL Bulbs from the "Energy Conservation Kit," what did you do with the remaining bulbs?
    1. I installed all of the bulbs in the kit
    2. I gave them away to friends or family
    3. I am storing them for future use
    4. I installed all of the CFL Bulbs…the other(s) were missing
    5. I installed all of the working CFL Bulbs…the other(s) were broken
    6. I installed all of the working CFL Bulbs…the other(s) were defective
    7. I disposed of them at a household hazardous waste collection site.
    97. Other (Specify)

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 4]

43. Why didn't you install any of the CFLs?
    1. Waiting until light bulbs burn out
    2. Don't like the color of CFLs

3. CFLs make a strange sound
4. CFLs don't fit in my lamp
97. Other (Specify)

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 4]

44. What did you do with the CFL bulbs that you did not install in or around your home?
    1. I installed all of the bulbs in the kit
    2. I gave them away to friends or family
    3. I am storing them for future use
    4. I installed all of the CFL Bulbs…the other(s) were missing
    5. I installed all of the working CFL Bulbs…the other(s) were broken
    6. I installed all of the working CFL Bulbs…the other(s) were defective
    7. I disposed of them at a household hazardous waste collection site.
    97. Other (Specify)

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

45. How many of the FAUCET AERATORS provided in the Energy Conservation Kit did you install?
    1. None
    2. One
    3. Two
    4 I did not receive faucet aerators

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2 or 3]

46. Where in the home was the first Faucet Aerator installed?

	Kitchen	Laundry Room	Bathroom	Garage	Other
Faucet Aerator #1	( )	( )	( )	( )	( )

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 3]

47. Where in the home was the second Faucet Aerator installed?

	Kitchen	Laundry Room	Bathroom	Garage	Other
Faucet Aerator #2	( )	( )	( )	( )	( )

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

48. Why didn't you install the other or all of the Faucet Aerator(s)?
    1. Already have faucet aerators installed
    2. Did not understand how to install
    3. Doesn't fit my faucet (wrong size)
    4. Doesn't fit my faucet (my kit didn't include a gender adapter)
    5. My city water supply pressure is too low
    6. My well water supply pressure is too low
    7. I've tried them in the past and they clog up too quickly.
    97. Other (Specify):

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

49. How many of the NIGHT LIGHTS provided in the Energy Conservation Kit did you install?
    1. None
    2. One
    3. Two

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

50. If you did not install the Night Light, what did you do with it?
    1. Still in box
    2. Thrown away
    3. Given to someone else
    99. Other (Specify)

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2]

51. Please describe where the FIRST (or only) Night Light was installed.
    1. Where there was no night light before (new night light)
    2. Where a standard night light was previously installed

[DISPLAY Q**Error! Reference source not found.** and Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 3 or Q**Error! Reference source not found.** = 2]

52. What did you do with the FIRST (or only) old night light?
    1. I threw it away
    2. I moved it to a new location
    3. I put it in storage for later use

53. Please describe where the SECOND Night Light was installed.

1. Where there was no night light before (new night light)
2. Where a standard night light was previously installed

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 3 or Q**Error! Reference source not found.** = 2]

54. What did you do with the SECOND old night light?
    1. I threw it away
    2. I moved it to a new location
    3. I put it in storage for later use

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

55. Did you install the SHOWERHEAD included in the Energy Conservation Kit?
    1. Yes
    2. No
    3. I did not receive a showerhead

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2]

56. Why didn't you install the Showerhead?
    1. I tried it but I didn't like it
    2. I prefer the showerhead(s) I already have
    3. I didn't know how to install it
    4. I haven't had time yet
    97. Other (Specify)

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

57. Where did you install the Showerhead?
    1. Master bathroom
    2. Any other bathroom

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

58. Did you install the FURNACE WHISTLE provided in the Energy Conservation Kit?
    1. Yes
    2. No

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

59. Has the furnace whistle indicated that you needed to change your filter by whistling?
    1. Yes
    2. No

98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

60. Have you replaced the furnace filter since installing the whistle?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

61. Did you reinstall the whistle when you replaced the furnace filter?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1 or 2 or Q**Error! Reference source not found.** = 2]

62. Do you think the whistle is useful for letting you know when to change the furnace filter?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2]

63. Why not?

[DISPLAY Q**Error! Reference source not found.** and **Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2]

64. Why didn't you install the furnace whistle?
    1. I didn't like the product's function
    2. I didn't know what it was for
    3. I didn't understand how to install it
    4. It was broken/ didn't work
    97. Other (Specify)

65. What did you do with the uninstalled Furnace Whistle?
    1. Still in box
    2. Threw it away
    3. Gave it to someone else
    97. Other (Specify)

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

66. What single item from the Energy Conservation Kit was MOST useful to you?
    1. CFL Bulbs
    2. Faucet Aerators
    3. Smart Power Strips
    4. Night Lights
    5. Showerhead
    6. Furnace Whistle

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1,2 or 3]

67. What wattage CFL bulb was most useful to you?
    1. 13 Watt
    2. 20 Watt
    3. 26 Watt
    4. I would have preferred a different wattage (please specify):

68. What other items do you think would be most useful to send in future Energy Conservation Kits?

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

69. How satisfied or dissatisfied are you with the performance and quality of the smart power strip?
    1. Very Satisfied
    2. Satisfied
    3. Neither satisfied nor dissatisfied
    4. Dissatisfied
    5. Very dissatisfied
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 4 or 5]

70. Why are you dissatisfied?

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1,2 or 3]

71. How satisfied or dissatisfied are you with the performance and quality of the CFL light bulbs?
    1. Very Satisfied
    2. Satisfied
    3. Neither satisfied nor dissatisfied
    4. Dissatisfied

5. Very dissatisfied
98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 4 or 5]

72. Why are you dissatisfied?

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2 or 3]

73. How satisfied or dissatisfied are you with the performance and quality of the faucet aerators?
    1. Very Satisfied
    2. Satisfied
    3. Neither satisfied nor dissatisfied
    4. Dissatisfied
    5. Very dissatisfied
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 4 or 5]

74. Why are you dissatisfied?

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2 or 3]

75. How satisfied or dissatisfied are you with the performance and quality of the night lights?
    1. Very Satisfied
    2. Satisfied
    3. Neither satisfied nor dissatisfied
    4. Dissatisfied
    5. Very dissatisfied
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 4 or 5]

76. Why are you dissatisfied?

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

77. How satisfied are you with the performance of the showerhead?
    1. Very Satisfied

2. Satisfied
3. Neither satisfied nor dissatisfied
4. Dissatisfied
5. Very dissatisfied
98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 4 or 5]

78. Why are you dissatisfied?

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

79. How satisfied or dissatisfied are you with the performance and quality of the furnace whistle?
    1. Very Satisfied
    2. Satisfied
    3. Neither satisfied nor dissatisfied
    4. Dissatisfied
    5. Very dissatisfied
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 4 or 5]

80. Why are you dissatisfied?

81. How satisfied or dissatisfied are you with the program overall?
    1. Very Satisfied
    2. Satisfied
    3. Neither satisfied nor dissatisfied
    4. Dissatisfied
    5. Very dissatisfied
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 4 or 5]

82. Why are you dissatisfied?

83. Before you received the kit, did you have the following items from the kit installed in your home?

	Yes	No	Don't know
CFLs	( )	( )	( )
Faucet aerators	( )	( )	( )

LED night lights	( )	( )	( )

84. Before receiving the energy saving kit, how would you rate your familiarity with the ways to save energy in your home?
    1. Very familiar
    2. Somewhat familiar
    3. A little familiar
    4. Not at all familiar
    98. Don't know

85. As a result of receiving the energy saving kit, how would you now rate your familiarity with ways to save energy in your home?
    1. Very familiar
    2. Somewhat familiar
    3. A little familiar
    4. Not at all familiar
    98. Don't know

86. Are you aware of other programs offered by FirstEnergy Ohio Utilities that can help you save money of your utility bill?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

87. Are you aware of each of the following programs?

	Yes	No
Home Energy Analyzer	( )	( )
HVAC Incentives	( )	( )
Appliance Turn-IN (refrigerator and freezer recycling)	( )	( )
Energy Efficiency Products (rebates for energy efficient appliances)	( )	( )
Easy Cool Rewards 9A/C cycling on and off at peak usage times)	( )	( )

Energy Audit (discounted energy audit of your home)	( )	( )
Energy Efficient New Homes (incentives for remodeling your home)	( )	( )
Lighting discounts (discounts and rebates for lighting projects)	( )	( )

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

88. Have you participated in any of the following programs?

	Yes	No	Don't know
Home Energy Analyzer	( )	( )	( )
HVAC Incentives	( )	( )	( )
Appliance Turn-IN (refrigerator and freezer recycling)	( )	( )	( )
Energy Efficiency Products (rebates for energy efficient appliances)	( )	( )	( )
Easy Cool Rewards 9A/C cycling on and off at peak usage times)	( )	( )	( )
Energy Audit (discounted energy audit of your home)	( )	( )	( )
Energy Efficient New Homes (incentives for remodeling your home)	( )	( )	( )
Lighting discounts (discounts and rebates for lighting projects)	( )	( )	( )

89. What factors motivated you to request an Energy Conservation Kit from FirstEnergy's Ohio Utilities? (Select all that apply)
    1. I was looking for ways to save energy in my home
    2. Recommendation from a friend
    3. The Energy Conservation Kit looked useful and valuable
    4. Just for fun
    5. It was free
    6. Environmental reasons
    7. I needed light bulbs
    8. I needed an efficient showerhead
    9. I needed faucet aerators
    10. Health of family
    97. Other (Specify)

90. How many people live in your household?
    1. 1
    2. 2
    3. 3
    4. 4
    5. 5
    6. 6
    7. 7
    8. 8
    9. 9
    10. 10

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

91. What are the ages of the members of your household?

	Under 10	10-20	20-30	30-40	40-50	50-65	65 or older
Person 1	( )	( )	( )	( )	( )	( )	( )

[DISPLAY Q**Error! Reference source not found.** IF Q90 = 2]

92. What are the ages of the members of your household?

	Under 10	10-20	20-30	30-40	40-50	50-65	65 or older
Person 1	( )	( )	( )	( )	( )	( )	( )
Person 2	( )	( )	( )	( )	( )	( )	( )

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 3]

93. What are the ages of the members of your household?

	Under 10	10-20	20-30	30-40	40-50	50-65	65 or older
Person 1	( )	( )	( )	( )	( )	( )	( )
Person 2	( )	( )	( )	( )	( )	( )	( )
Person 3	( )	( )	( )	( )	( )	( )	( )

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 4]

94. What are the ages of the members of your household?

	Under 10	10-20	20-30	30-40	40-50	50-65	65 or older
Person 1	( )	( )	( )	( )	( )	( )	( )
Person 2	( )	( )	( )	( )	( )	( )	( )
Person 3	( )	( )	( )	( )	( )	( )	( )
Person 4	( )	( )	( )	( )	( )	( )	( )

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 5]

95. What are the ages of the members of your household?

	Under 10	10-20	20-30	30-40	40-50	50-65	65 or older
Person 1	( )	( )	( )	( )	( )	( )	( )
Person 2	( )	( )	( )	( )	( )	( )	( )
Person 3	( )	( )	( )	( )	( )	( )	( )
Person 4	( )	( )	( )	( )	( )	( )	( )
Person 5	( )	( )	( )	( )	( )	( )	( )

[DISPLAY Q**Error! Reference source not found.** IF Q90 = 6]

96. What are the ages of the members of your household?

	Under 10	10-20	20-30	30-40	40-50	50-65	65 or older
Person 1	( )	( )	( )	( )	( )	( )	( )
Person 2	( )	( )	( )	( )	( )	( )	( )
Person 3	( )	( )	( )	( )	( )	( )	( )

Person 4	( )	( )	( )	( )	( )	( )	( )
Person 5	( )	( )	( )	( )	( )	( )	( )
Person 6	( )	( )	( )	( )	( )	( )	( )

[DISPLAY Q**Error! Reference source not found.** IF Q90 = 7]
97. What are the ages of the members of your household?

	Under 10	10-20	20-30	30-40	40-50	50-65	65 or older
Person 1	( )	( )	( )	( )	( )	( )	( )
Person 2	( )	( )	( )	( )	( )	( )	( )
Person 3	( )	( )	( )	( )	( )	( )	( )
Person 4	( )	( )	( )	( )	( )	( )	( )
Person 5	( )	( )	( )	( )	( )	( )	( )
Person 6	( )	( )	( )	( )	( )	( )	( )
Person 7	( )	( )	( )	( )	( )	( )	( )

[DISPLAY Q**Error! Reference source not found.** IF Q90 = 8]
98. What are the ages of the members of your household?

	Under 10	10-20	20-30	30-40	40-50	50-65	65 or older
Person 1	( )	( )	( )	( )	( )	( )	( )
Person 2	( )	( )	( )	( )	( )	( )	( )
Person 3	( )	( )	( )	( )	( )	( )	( )
Person 4	( )	( )	( )	( )	( )	( )	( )
Person 5	( )	( )	( )	( )	( )	( )	( )
Person 6	( )	( )	( )	( )	( )	( )	( )
Person 7	( )	( )	( )	( )	( )	( )	( )
Person 8	( )	( )	( )	( )	( )	( )	( )

[DISPLAY Q**Error! Reference source not found.** IF Q90 = 9]
99. What are the ages of the members of your household?

	Under 10	10-20	20-30	30-40	40-50	50-65	65 or older
Person 1	( )	( )	( )	( )	( )	( )	( )

Person 2	( )	( )	( )	( )	( )	( )	( )
Person 3	( )	( )	( )	( )	( )	( )	( )
Person 4	( )	( )	( )	( )	( )	( )	( )
Person 5	( )	( )	( )	( )	( )	( )	( )
Person 6	( )	( )	( )	( )	( )	( )	( )
Person 7	( )	( )	( )	( )	( )	( )	( )
Person 8	( )	( )	( )	( )	( )	( )	( )
Person 9	( )	( )	( )	( )	( )	( )	( )

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 10]

100. What are the ages of the members of your household?

	Under 10	10-20	20-30	30-40	40-50	50-65	65 or older
Person 1	( )	( )	( )	( )	( )	( )	( )
Person 2	( )	( )	( )	( )	( )	( )	( )
Person 3	( )	( )	( )	( )	( )	( )	( )
Person 4	( )	( )	( )	( )	( )	( )	( )
Person 5	( )	( )	( )	( )	( )	( )	( )
Person 6	( )	( )	( )	( )	( )	( )	( )
Person 7	( )	( )	( )	( )	( )	( )	( )
Person 8	( )	( )	( )	( )	( )	( )	( )
Person 9	( )	( )	( )	( )	( )	( )	( )
Person 10	( )	( )	( )	( )	( )	( )	( )

101. Do you have any suggestions for FirstEnergy's Ohio Utilities on how to further improve the Energy Conservation Kit?

10.3 Schools Kits Participation Survey

1. According to our records, you received an Energy Conservation Kit supplied by FirstEnergy's Ohio Utilities that was requested through your child's school. Is that correct?
    1. Yes
    2. No [THANK AND TERMINATE INTERVIEW]

2. Does your home have an electric water heater or a gas water heater?
    1. Electric water heater
    2. Non-electric water heater

3. Who is the primary decision-maker in your household when it comes to home energy issues?
    1. Me
    2. My spouse/domestic partner/significant other
    3. Someone else (Specify)

4. How did you first hear about FirstEnergy's Ohio Utilities' Energy Conservation Kit Program? (Select all that apply)
    1. Received information in mail
    2. Read newspaper or magazine article
    3. Referred by friend/family
    4. TV Commercial
    5. FirstEnergy's Ohio Utilities' Bill message/ Bill insert
    6. FirstEnergy's Ohio Utilities' website
    7. FirstEnergy's Ohio Utilities' telephone representative
    8. Through a program at my child's school
    97. Other (Specify)

5. How satisfied or dissatisfied are you with the process used to request and receive the kit?
    1. Very satisfied
    2. Satisfied
    3. Neither satisfied nor dissatisfied
    4. Dissatisfied
    5. Very dissatisfied
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 4 or 5]

6. Why were you dissatisfied with the process used to request and receive the kit?

7. Approximately how many weeks did it take to receive the kit after you requested it?
    1. Very satisfied
    2. Satisfied
    3. Neither satisfied nor dissatisfied

4. Dissatisfied
5. Very dissatisfied
98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2]

8. How satisfied or dissatisfied are you with the process used to request and receive the kit?

9. Did you receive 13W (60W Equivalent) CFLs in your Energy Conservation Kit? Example shown below. The actual item may have a slightly different appearance or it may be from a different manufacture? [IMAGE OF CFL BULB]
   1. Yes
   2. No

10. Did you receive 18W (60W Equivalent) CFLs in your Energy Conservation Kit? Example shown below. The actual item may have a slightly different appearance or it may be from a different manufacture? [IMAGE OF CFL BULB]
   1. Yes
   2. No

11. Did you receive a LED Night Light in your Energy Conservation Kit? Example shown below. The actual item may have a slightly different appearance or it may be from a different manufacture? [IMAGE OF NIGHT LIGHT]
   1. Yes
   2. No

12. Did you receive faucet aerators in your Energy Conservation Kit? Example shown below. The actual item may have a slightly different appearance or it may be from a different manufacture? [IMAGE OF FAUCET AERATOR]
   1. Yes
   2. No

13. Were any of the kit items broken or not working when you received them?
   1. Yes
   2. No
   98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

14. Did you contact any one about the items that were broken or not working?
   1. Yes
   2. No
   98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]
15. Who did you contact?

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]
16. Was the item replaced?
    1. Yes
    2. No
    98. Don't know

ELECTRIC WATER HEATER KITS

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]
17. At the time when you requested the kit, did you know that each of the follow would be included in the kit?

	Yes	No	Don't know
CFLS	( )	( )	( )
Faucet aerators	( )	( )	( )
LED night lights	( )	( )	( )

18. When you received the Energy Conservation Kit containing CFL light bulbs and other energy efficient products, did you install any of these products?
    1. Yes
    2. No

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2]
19. Why didn't you install any of the items in the Energy Conservation Kit?
    1. I didn't like any of the products
    2. I haven't had time yet
    3. I gave the entire kit to someone else
    97. Other (Specify)

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]
20. If you installed any of the CFL LIGHT BULBS provided in the Energy Conservation Kit, please indicate the different types you installed.
    1. 13 watt (60 watt equivalent)
    2. 18 watt (75 watt equivalent)

3. I did not install and of the bulbs included in the Energy Conservation Kit

[DISPLAY Q**Error! Reference source not found.** and Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

21. How many of the 13 Watt (60 Watt Equivalent) Spiral CFL Bulbs did you install (up to a maximum of 3 bulbs)?

22. For the 13W bulbs that you installed, where did you install these bulbs? (Leave blank if they do not know where the bulbs were installed)

1. Living room
2. Bathroom
3. Kitchen
4. Outdoors
5. Family Room
6. Bedroom
7. Garage
8. Hallway
9. Office
10. Laundry Room
11. Dining Room
98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

23. Did you install the 18 W CFL bulb?

1. Yes
2. No
3. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

24. Which room did you install the 18 W CFL in?

1. Living room
2. Bathroom
3. Kitchen
4. Outdoors
5. Family Room
6. Bedroom
7. Garage
8. Hallway
9. Office
10. Laundry Room
11. Dining Room
98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1 or 2]

25. If you did not install ALL of the CFL Bulbs from the "Energy Conservation Kit," what did you do with the remaining bulbs?
    1. I installed all of the bulbs in the kit
    2. I gave them away to friends or family
    3. I am storing them for future use
    4. I installed all of the CFL Bulbs…the other(s) were missing
    5. I installed all of the working CFL Bulbs…the other(s) were broken
    6. I installed all of the working CFL Bulbs…the other(s) were defective
    7. I disposed of them at a household hazardous waste collection site.
    97. Other (Specify)

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 3]

26. Why didn't you install any of the CFLs?
    1. Waiting until light bulbs burn out
    2. Don't like the color of CFLs
    3. CFLs make a strange sound
    4. CFLs don't fit in my lamp
    97. Other (Specify)

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 3]

27. What did you do with the CFL bulbs that you did not install in or around your home?
    1. I installed all of the bulbs in the kit
    2. I gave them away to friends or family
    3. I am storing them for future use
    4. I installed all of the CFL Bulbs…the other(s) were missing
    5. I installed all of the working CFL Bulbs…the other(s) were broken
    6. I installed all of the working CFL Bulbs…the other(s) were defective
    7. I disposed of them at a household hazardous waste collection site.
    97. Other (Specify)

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

28. How many of the FAUCET AERATORS provided in the Energy Conservation Kit did you install?
    1. None
    2. One
    3. Two
    4. I did not receive faucet aerators

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2 or 3]

29. Where in the home was the first Faucet Aerator installed?

	Kitchen	Laundry Room	Bathroom	Garage	Other
Faucet Aerator #1	( )	( )	( )	( )	( )

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 3]

30. Where in the home was the second Faucet Aerator installed?

	Kitchen	Laundry Room	Bathroom	Garage	Other
Faucet Aerator #2	( )	( )	( )	( )	( )

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

31. Why didn't you install the other or all of the Faucet Aerator(s)?
    1. Already have faucet aerators installed
    2. Did not understand how to install
    3. Doesn't fit my faucet (wrong size)
    4. Doesn't fit my faucet (my kit didn't include a gender adapter)
    5. My city water supply pressure is too low
    6. My well water supply pressure is too low
    7. I've tried them in the past and they clog up too quickly.
    97. Other reason (Specify)

32. Did you install the NIGHT LIGHT provided in the Energy Conservation Kit?
    1. Yes
    2. No

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2]

33. If you did not install the Night Light, what did you do with it?
    1. Still in box
    2. Thrown away
    3. Given to someone else
    97. Other (Specify)

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

34. Please describe where the Night Light was installed.

1. Where there was no night light before (new night light)
2. Where a standard night light was previously installed

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2]

35. What did you do with the old night light?
    1. I threw it away
    2. I moved it to a new location
    3. I put it in storage for later use

36. What single item from the Energy Conservation Kit was MOST useful to you?
    1. CFL Bulbs
    2. Faucet Aerators
    3. Night Lights

37. What wattage CFL bulb was most useful to you?
    1. 13 Watt
    2. 18 Watt
    3. I would have preferred a different wattage (please specify):

38. What other items do you think would be most useful to send in future Energy Conservation Kits?

39. How satisfied or dissatisfied are you with the performance and quality of the CFL light bulbs?
    1. Very Satisfied
    2. Satisfied
    3. Neither satisfied nor dissatisfied
    4. Dissatisfied
    5. Very dissatisfied
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 4 or 5]

40. Why are you dissatisfied?

41. How satisfied or dissatisfied are you with the performance and quality of the faucet aerators?
    1. Very Satisfied
    2. Satisfied
    3. Neither satisfied nor dissatisfied
    4. Dissatisfied
    5. Very dissatisfied
    98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 4 or 5]

42. Why are you dissatisfied?

43. How satisfied or dissatisfied are you with the performance and quality of the night light?

1. Very Satisfied
2. Satisfied
3. Neither satisfied nor dissatisfied
4. Dissatisfied
5. Very dissatisfied
98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 4 or 5]

44. Why are you dissatisfied?

45. How satisfied or dissatisfied are you with the program overall?

1. Very Satisfied
2. Satisfied
3. Neither satisfied nor dissatisfied
4. Dissatisfied
5. Very dissatisfied
98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 4 or 5]

46. Why are you dissatisfied?

47. Before you received the kit, did you have the following items from the kit installed in your home?

	Yes	No	Don't know
CFLs	( )	( )	( )
Faucet aerators	( )	( )	( )
LED night lights	( )	( )	( )

48. Before receiving the energy saving kit, how would you rate your familiarity with the ways to save energy in your home?

1. Very familiar
2. Somewhat familiar
3. A little familiar
4. Not at all familiar
98. Don't know

49. As a result of receiving the energy saving kit, how would you now rate your familiarity with ways to save energy in your home?

1. Very familiar
2. Somewhat familiar
3. A little familiar
4. Not at all familiar
98. Don't know

50. Are you aware of other programs offered by FirstEnergy Ohio Utilities that can help you save money of your utility bill?
1. Yes
2. No
98. Don't know

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

51. Are you aware of each of the following programs?

	Yes	No
Home Energy Analyzer	( )	( )
HVAC Incentives	( )	( )
Appliance Turn-IN (refrigerator and freezer recycling)	( )	( )
Energy Efficiency Products (rebates for energy efficient appliances)	( )	( )
Easy Cool Rewards 9A/C cycling on and off at peak usage times)	( )	( )
Energy Audit (discounted energy audit of your home)	( )	( )
Energy Efficient New Homes (incentives for remodeling your home)	( )	( )
Lighting discounts (discounts and rebates for lighting projects)	( )	( )

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]

52. Have you participated in any of the following programs?

	Yes	No	Don't know

Home Energy Analyzer	( )	( )	( )
HVAC Incentives	( )	( )	( )
Appliance Turn-IN (refrigerator and freezer recycling)	( )	( )	( )
Energy Efficiency Products (rebates for energy efficient appliances)	( )	( )	( )
Easy Cool Rewards 9A/C cycling on and off at peak usage times)	( )	( )	( )
Energy Audit (discounted energy audit of your home)	( )	( )	( )
Energy Efficient New Homes (incentives for remodeling your home)	( )	( )	( )
Lighting discounts (discounts and rebates for lighting projects)	( )	( )	( )

53. What factors motivated you to request an Energy Conservation Kit from FirstEnergy's Ohio Utilities? (Select all that apply)

1. I was looking for ways to save energy in my home
2. Recommendation from a friend
3. The Energy Conservation Kit looked useful and valuable
4. Just for fun
5. It was free
6. Environmental reasons
7. I needed light bulbs
8. I needed an efficient showerhead
9. I needed faucet aerators
10. Health of family
97. Other (Specify)

54. How many people live in your household?

1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7
8. 8
9. 9
10. 10

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 1]
55. What are the ages of the members of your household?

	Under 10	10-20	20-30	30-40	40-50	50-65	65 or older
Person 1	( )	( )	( )	( )	( )	( )	( )

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 2]
56. What are the ages of the members of your household?

	Under 10	10-20	20-30	30-40	40-50	50-65	65 or older
Person 1	( )	( )	( )	( )	( )	( )	( )
Person 2	( )	( )	( )	( )	( )	( )	( )

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 3]
57. What are the ages of the members of your household?

	Under 10	10-20	20-30	30-40	40-50	50-65	65 or older
Person 1	( )	( )	( )	( )	( )	( )	( )
Person 2	( )	( )	( )	( )	( )	( )	( )
Person 3	( )	( )	( )	( )	( )	( )	( )

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 4]
58. What are the ages of the members of your household?

	Under 10	10-20	20-30	30-40	40-50	50-65	65 or older

Person 1	( )	( )	( )	( )	( )	( )	( )
Person 2	( )	( )	( )	( )	( )	( )	( )
Person 3	( )	( )	( )	( )	( )	( )	( )
Person 4	( )	( )	( )	( )	( )	( )	( )

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 5]

59. What are the ages of the members of your household?

	Under 10	10-20	20-30	30-40	40-50	50-65	65 or older
Person 1	( )	( )	( )	( )	( )	( )	( )
Person 2	( )	( )	( )	( )	( )	( )	( )
Person 3	( )	( )	( )	( )	( )	( )	( )
Person 4	( )	( )	( )	( )	( )	( )	( )
Person 5	( )	( )	( )	( )	( )	( )	( )

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 6]

60. What are the ages of the members of your household?

	Under 10	10-20	20-30	30-40	40-50	50-65	65 or older
Person 1	( )	( )	( )	( )	( )	( )	( )
Person 2	( )	( )	( )	( )	( )	( )	( )
Person 3	( )	( )	( )	( )	( )	( )	( )
Person 4	( )	( )	( )	( )	( )	( )	( )
Person 5	( )	( )	( )	( )	( )	( )	( )
Person 6	( )	( )	( )	( )	( )	( )	( )

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 7]

61. What are the ages of the members of your household?

	Under 10	10-20	20-30	30-40	40-50	50-65	65 or older
Person 1	( )	( )	( )	( )	( )	( )	( )
Person 2	( )	( )	( )	( )	( )	( )	( )

Person 3	( )	( )	( )	( )	( )	( )	( )
Person 4	( )	( )	( )	( )	( )	( )	( )
Person 5	( )	( )	( )	( )	( )	( )	( )
Person 6	( )	( )	( )	( )	( )	( )	( )
Person 7	( )	( )	( )	( )	( )	( )	( )

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 8]

62. What are the ages of the members of your household?

	Under 10	10-20	20-30	30-40	40-50	50-65	65 or older
Person 1	( )	( )	( )	( )	( )	( )	( )
Person 2	( )	( )	( )	( )	( )	( )	( )
Person 3	( )	( )	( )	( )	( )	( )	( )
Person 4	( )	( )	( )	( )	( )	( )	( )
Person 5	( )	( )	( )	( )	( )	( )	( )
Person 6	( )	( )	( )	( )	( )	( )	( )
Person 7	( )	( )	( )	( )	( )	( )	( )
Person 8	( )	( )	( )	( )	( )	( )	( )

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 9]

63. What are the ages of the members of your household?

	Under 10	10-20	20-30	30-40	40-50	50-65	65 or older
Person 1	( )	( )	( )	( )	( )	( )	( )
Person 2	( )	( )	( )	( )	( )	( )	( )
Person 3	( )	( )	( )	( )	( )	( )	( )
Person 4	( )	( )	( )	( )	( )	( )	( )
Person 5	( )	( )	( )	( )	( )	( )	( )
Person 6	( )	( )	( )	( )	( )	( )	( )
Person 7	( )	( )	( )	( )	( )	( )	( )
Person 8	( )	( )	( )	( )	( )	( )	( )
Person 9	( )	( )	( )	( )	( )	( )	( )

[DISPLAY Q**Error! Reference source not found.** IF Q**Error! Reference source not found.** = 10]

64. What are the ages of the members of your household?

	Under 10	10-20	20-30	30-40	40-50	50-65	65 or older
Person 1	( )	( )	( )	( )	( )	( )	( )
Person 2	( )	( )	( )	( )	( )	( )	( )
Person 3	( )	( )	( )	( )	( )	( )	( )
Person 4	( )	( )	( )	( )	( )	( )	( )
Person 5	( )	( )	( )	( )	( )	( )	( )
Person 6	( )	( )	( )	( )	( )	( )	( )
Person 7	( )	( )	( )	( )	( )	( )	( )
Person 8	( )	( )	( )	( )	( )	( )	( )
Person 9	( )	( )	( )	( )	( )	( )	( )
Person 10	( )	( )	( )	( )	( )	( )	( )

65. Do you have any suggestions for FirstEnergy's Ohio Utilities on how to further improve the Energy Conservation Kit?

66. Please make any corrections needed in the following fields
    First name:
    Last name:
    Mailing address:
    City:
    State:
    Zip code:
    Electric Operating Company Account Number:

11. Appendix D: New Homes Interview Guides and Survey Instruments

11.1 New Homes Builder Interview Guide

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.

11.1.1 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?

11.1.2 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.

11.1.3 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 2013? [NOTE: Be sure to ask each of the bullet questions below.]
   - How many of these were qualified to receive a rebate from FirstEnergy's New Homes Program?
   - How many did you receive rebates for through the program?
2. Approximately how many <u>total</u> homes do you expect to complete in 2014?
   - Of your 2014 homes, how many (what percentage of total builds) 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 participation experience.]

3. 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.)

4. Do you mostly build spec homes, or do buyers have input into the final designs? If the builder indicates they build custom homes, what are the most requested energy efficient measure for custom builds?

5. 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?

11.1.4 Program Requirements

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

6. Are any program requirements unclear to you?
   - If YES: Which ones?
7. If you had to estimate the additional cost to you to go from a standard code home to an Energy Star 3.0 version home, what would that be?
8. How do you recover the costs in conjunction with the program rebates?
9. Are appraisal values of your Energy Star homes an issue for you?
10. 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.)
11. What are your biggest challenges to building program qualifying homes?
12. 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?
13. 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: Which rebate programs are the most influential to you building above code?
    - If YES: How do you think homebuyers perceive homes built to FirstEnergy's requirements compared to other green homebuilding programs?

11.1.5 Marketing

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

14. 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?

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

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

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

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

18. Have you received the same, more, or less 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 in the current housing market?

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

21. Have you received feedback from customers regarding the energy efficiency of their home?

22. What equipment do homebuyers mention most when discussing the energy efficiency of their home, (if custom built: either during the design phase or) post-purchase?

23. (If custom built) Are there particular things they are willing to pay more for in order to be more efficient?

11.1.6 Program Interactions

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

24. 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?

25. 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?

26. [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?

27. 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.)

28. How well is the rebates payment process working for you?
    If answer is approximately poorly, ask how could it be improved?

11.1.7 Overall Program

I just have a few final questions about the program.

29. Given everything we've discuss, what do you consider to be the biggest advantages of the program to you from being a program builder?

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

31. Prior to your decision to participate in FirstEnergy's New Homes program, did you perceive any barriers or disadvantages to program participation?
    If YES, has FirstEnergy implemented any policy or program change that removed the barriers?

32. How can the Energy's New Homes program be improved to encourage builder participation?

33. 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?

11.1.8 Wrap-up

32. 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.

11.1 New Homes Program and Implementation Staff Interview Guide

11.1.1 Interview Objectives

- How effective have the marketing efforts been for the program? Which marketing methods have proven to be the most effective?
- How effectively have managers been able to monitor and administer the program?
- What were the issues and concerns about implementing the program in 2013? What issues remain unresolved?
- What were the lessons learned in implementing the program in 2013?
- How well has the team (i.e., FirstEnergy staff and implementation staff) worked together? Characterize internal program management and operations including communications, staffing, and marketing.
- What changes, with regard to program design or delivery, should the program implement in order to improve effectiveness? Understand program design process, program launch and program's key challenges. Understand the program's service offerings, the types of customers participating and not participating, and role of trade allies and implementation contractors.

11.1.2 Describe your role with the program in Ohio

1. What are your responsibilities and roles in this program?
2. When did you become involved in the program?
3. (If FirstEnergy Staff) Responsibilities and roles within FirstEnergy and, specifically, for energy efficiency
4. (If FirstEnergy Staff) Any previous experience with energy efficiency (implementing, overseeing energy efficiency programs, etc.)

11.1.3 Who do you interact with directly as part of this program (examples listed below)

5. Trade allies, builders, raters?
6. Program manager/implementation contractor?
7. Customers?

8. Public Utilities Commission and advocacy groups?

9. Statewide Evaluator?

10. Others?

11.1.4 Program Planning and Design

11. How were you involved in the program planning and design, if at all? How does the Ohio iteration of the program differ from the Pennsylvania program offering?

12. How were the program's goals set? How are these goals communicated both internally and externally? Are the goals set by territory?

13. How will program progress toward goals be monitored and reported to the utility? How is the program doing in meeting these goals in 2013? How about 2014?

14. What are the implications for the program of not meeting goals? What are the implications for oversubscribing?

11.1.5 Program Design

15. Could you please provide an update on the progress of the program? What barriers have you encountered since the program's launch? What are key successes from the program's launch?

16. Please provide an overview of the program, including standard equipment and incentive strategy.

17. What are the target markets for the program?

18. Do the incentive levels seem appropriate? If not, why do you think that? What, if any, changes in the incentive levels do you think may be needed?

11.1.6 Program Operations

19. What are the participation steps from the builder's perspective? From the customer's perspective

20. How long does it take before the incentive payment is received? What step in the process if any hinders process of incentive payment?

21. What parties are involved in administering and/or serving customers through the program? (Probe for trade allies, implementation contractors, etc.) What do they do?

22. Describe your communications and working relationship with raters/builders. (If not revealed above, distinguish between the different trade ally groups involved.) Follow up question: what can be improved on by FirstEnergy to improve communication with raters/builders?

23. What support is provided through the program to builders, raters, etc.? In what areas could this be improved?

24. Have you received compliments or criticisms from participants/builders? What are the typical topics brought up?

25. What type of quality control measures are in place for the program or are planned? What percentage of projects will receive QC? What types of problems are most common (if any QC has been performed yet)?

26. How can the program be modified to increase builder participation?

27. What do you see as future challenges to the program?

11.1.7 Program Operations and Management

28. Do you feel there are sufficient resources to effectively operate and manage the programs? If no, what additional resources are needed overall (by program)?

29. How is program information communicated internally (or planned to be communicated) within FirstEnergy? Do you feel the correct mechanisms are in place for internal program information dissemination? Probe about any improvements needed or plans in place.

30. How often are progress reports generated on program performance? Who is responsible for this?

31. What additional reporting is required (type and dates)?

32. (If FirstEnergy Staff) How effectively have program managers been able to monitor and administer the program? Are you confident in the information and data reported to you by the program administrator/implementer? Are additional QA/QC controls required to improve confidence (if applicable)? What additional information or data would be useful?

33. (If implementation staff) How effectively have program managers been able to monitor and administer the program? Are you confident in the information and data reported to you? Are additional QA/QC monitoring controls required to improve confidence (if applicable)? What additional information or data would be useful?

34. What aspects of the program operations and management are working well or are expected to work well? Which are not working well or may be a concern?

35. What do you see as challenges to the program's operations and management?

36. What implementation issues in 2013 remain unresolved and why?

37. What were the lessons learned in implementing the program in 2013?

11.1.8 Program Marketing and Outreach

38. What overall marketing activities are being or will be used to reach the different target markets? Who conducts these? Have you noticed changes in participation levels relative to the release of each marketing effort? Do you feel that a specific type of effort works better than others?

39. How effective do you feel each of these methods has been in identifying and enrolling potential participants? Why?

40. How will program information be communicated to builders, raters and other external stakeholders? Probe about any improvements needed.

41. What are major barriers to participation (both customers and builders)?

42. Why do you think some choose to participate or not participate?

43. Are there any specific types of customers/stakeholders that face more barriers than others?

11.1.9 Conclusion

44. Is there anything we haven't covered today that we should be aware of when evaluating the program?

45. If I have any additional questions, can I call you or email you my questions? (Confirm contact information)

11.2 New Homes Rater Interview Guide

This interview guide is for raters who work with FirstEnergy to provide services through the 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 raters.

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.

11.2.1 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?

11.2.2 Introduction

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

I am calling to better understand how well FirstEnergy's New Homes program is operating and how it could potentially be improved. As part of our study we are speaking with program HERS raters like you, to learn about your experiences with the program.

I'm not selling anything; I'd just like to ask your experiences with this program. Let me assure you that your responses will be kept confidential and your individual responses will not be revealed to anyone unless you grant permission.

If needed: Our findings will be reported to FirstEnergy in a confidential, "summary" format that combines responses from all interviewees. We will not identify you or your company.

This call will take about 30 minutes of your time. Is this a good time for us to speak with you? IF NOT, SET UP CALL BACK APPOINTMENT.

11.2.3 Introduction and Business Scope

I'd like to start with some general information about you and the company you work for.

1. Approximately how many total new homes did your company work with in Ohio in 2013 as a rater?
    - And how many of these were FirstEnergy program homes?
    - And about how many different Ohio home builders did you work with in 2013?

2. Do you think your new homes business in Ohio will increase, decrease or remain about the same in 2014? Why?

3. Besides rating homes, what other services does your company offer to builders or their contractors, if any? (E.g., HVAC installation/commissioning, Duct sealing/testing, Lighting, Permitting, Inspections for other building programs, General construction consulting, Green/EE construction consulting)

11.2.4 Program Requirements

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

4. Are any program requirements unclear to you?
    - If YES: Which ones?

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

6. How is the process for rating FirstEnergy homes going?
    - What are your biggest challenges as a home rater?
    - Who helps you address any problems related to the specifications? How has this gone?

7. Do the builder's and their subcontractors understand program requirements?
    - What don't they understand?

- Do they need additional training?
- If YES: Who should provide this? Why?
- What are builders' most common challenges that may limit program participation?

8. How satisfied are you with the program's technical support?
    - PROBE: What kind of support does FirstEnergy provide? (Confirm if this help is from FirstEnergy or someone else)
    - How important is this support for your participation in the program?
9. Are you aware of other "green" or energy efficiency related programs for new homes in Ohio?
    - If YES: Do you also work with builders on these types of homes?
    - If YES: How do you think homebuyers perceive homes built to FirstEnergy's requirements compared to other green homebuilding programs?
    - What other rebate programs do builders take advantage of?

11.2.5 Marketing

Now I'd like to ask you about program marketing.

10. Do you actively promote the program to builders?

11. Have you recruited any new builders to the program?

12. How do builders typically learn about this program?

13. Do you work with builder or real estate sales staff to help them promote the energy efficiency of these program homes? Other groups?

IF YES:

- What do you do? (Probe to see if info on website, calling builders, presentations, etc.)
- Which benefits of energy efficient homes do you promote?
- Could you provide me with the name of the realtor you use?

14. Do you think builders/realtors understand the advantages of FirstEnergy program homes?

15. Do you think builders/realtors are adequately promoting the advantages of these homes?

16. Which program features seem to be most beneficial/valuable to the homebuyers? What about to builders? How about the least beneficial/valuable?

17. Are there certain energy efficient measures builders avoid due to the cost regardless of the program's rebates? Are there measures that are under installed by builders because the rebate amount is not sufficient to make these measures cost effective?

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

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

20. Does the ENERGY STAR label provide a sales advantage in the current housing market?

11.2.6 Program Interactions

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

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

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

23. Tell me about your collaboration/relationship with your builders in certifying homes.
    - What is the process?
    - What is going well?
    - What improvements could be made?

- Are there any builders who have consistent issues with homes failing the certification process? What are these issues and how should these be addressed?

24. How efficiently is the home certification process performing? Could this be improved in any way? Are there different stages of the certification process that work better than others?

25. How do you work with the program providers who certify the homes and conduct quality assurance inspections?
    - What is the process?
    - What is going well?
    - What improvements could be made?

27. How is the use of COMPASS to submit paperwork? Any recommended changes?

28. Have you had any issues with their QA/QC process?
    - IF YES, how have they been addressed? Or how would you like to see them addressed?

11.2.7 Overall Program

I just have a few final questions about the program.

29. Given everything we've discusses, what has been the biggest challenge for you in being a Rater for FirstEnergy's New Homes program? For builders?
    - (If needed) What about the incremental costs of building more energy efficient homes? Are these a challenge for your builders, even after FirstEnergy's rebates are considered?
    - Are appraisals of your builder's homes an issue?

30. What do you think are the biggest challenges for constructing and/or selling energy efficient homes going forward? Do you have any suggestions for overcoming these challenges?

31. 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?

11.2.8 Feedback

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

11.2.9 Wrap-up

33. 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.

12. Appendix E: Behavioral Survey Instruments

12.1.1 Behavioral Modification Participant Survey

1. Our records indicate that you received a Home Electricity Report. Is this true?
    1. True
    2. False

2. Would you tell me how you first learned about Home Electricity Reports?
    1. Bill Insert
    2. Direct email from a FirstEnergy utility
    3. Energy Save Ohio website
    4. FirstEnergy utility website
    5. Print/Newspaper Ad
    6. Radio
    7. Word-of-Mouth
    97. Other (Specify):

3. Would you share with us how you found out how to get a Home Electricity Report?
    1. Bill insert
    2. Direct email from FirstEnergy utility
    3. FirstEnergy website
    97. Other (Specify):

4. What first got your attention and made you decide to request a Home Electricity Report?
    1. Curiosity
    2. Energy conservation
    3. Financial motives (high bills)
    97. Other (Specify):
    98. Don't Know

5. What kind of detailed energy savings ideas did you receive in your Home Electricity Report?
    1. No-cost/low cost ways to save energy immediately
    2. Ways to save requiring investment that would pay off in the future
    3. Ways to save that would not be cost-justified
    97. Other (Specify)

[DISPLAY Q6 IF Q5 = 98]

6. What other detailed energy savings ideas did you receive?

7. Would you say the information contained in the Home Electricity Report was helpful?
    1. Very helpful
    2. Somewhat helpful
    3. Neither helpful nor unhelpful
    4. Somewhat unhelpful
    5. Very unhelpful
    98. Don't Know

[DISPLAY Q8 IF Q7 = 1 or 2]
8. Which aspect of the Home Electricity Report was the least helpful to you? Why?

[DISPLAY Q9 IF Q7 = 4 or 5]
9. What aspect of the Home Electricity Report was most helpful to you? Why?

10. Would you say the information contained in the Home Electricity Report was easy to understand?
    1. Very easy
    2. Somewhat easy
    3. Neither easy nor difficult
    4. Somewhat difficult
    5. Very Difficult
    98. Don't know

[DISPLAY Q11 IF Q10 = 1 or 2]
11. How could the Home Electricity Report be changed to make it easier to understand or implement?

12. What energy saving actions were you able to take in the past year, if any, in response to the personalized action steps, tips, or other information contained in the Home Electricity Report?
    1. Changes to your home, lighting or appliances(e.g. replaced an appliance with one that is more energy efficient)
    2. Changes to what you do(e.g. turn off lights when leaving a room, adjust the thermostat when leaving the house)
    3. Both changes to your home, lighting or appliances and changes to what you do
    4. No changes made yet
    98. Don't know

[DISPLAY Q13 IF Q12 = 1 or 3]
13. I made changes to my...

1. Appliances
2. HVAC
3. Lighting
4. General
5. Water heating measures
97. Other (Specify)

[DISPLAY Q14 IF Q12 = 2 or 3]
14. I made changes to how I use my...
    1. Appliances
    2. HVAC
    3. Lighting
    4. General
    5. Water heating measures
    97. Other (Specify)

[DISPLAY Q15 IF Q12 = 2 or 3]
15. Do you do things differently now to save energy in hot weather?
    1. Yes
    2. No
    98. Don't Know

[DISPLAY Q16 IF Q15 = 1]
16. What do you do differently now?

[DISPLAY Q17 IF Q12 = 2 or 3]
17. Do you do things differently now to save energy in cold weather?
    1. Yes
    2. No
    98. Don't Know

[DISPLAY Q18 IF Q17 = 1]
18. What do you do differently now?

[DISPLAY Q19 IF Q15 or Q17 = 1]
19. Have you noticed any savings on your electric bill since you made these changes?
    1. Yes, my electric bill has decreased
    2. No, there does not seem to be a change in my electric bill
    3. Not sure or too soon to tell
    98. Don't Know

[DISPLAY Q20 IF Q19 = 1]

20. How satisfied are you with the savings you noticed on your electric bill since making these changes?
    1. Very satisfied
    2. Somewhat satisfied
    3. Neither satisfied nor dissatisfied
    4. Somewhat dissatisfied
    5. Very dissatisfied
    98. Don't Know

21. Overall, how satisfied are you with your Home Electricity Report?
    1. Very satisfied
    2. Somewhat satisfied
    3. Neither satisfied nor dissatisfied
    4. Somewhat dissatisfied
    5. Very dissatisfied
    98. Don't Know

[DISPLAY Q22 IF Q21 = 4 or 5]
22. Why did you give it that rating?

23. Do you have any suggestions to improve the Home Electricity Reports?

24. Have you participated in any other FirstEnergy residential energy conservation programs in this or past years?
    1. HVAC tune-ups and rebates
    2. Residential energy audits
    3. Easy Cool Rewards Program (rebates for programmable thermostats)
    4. CFL retail program
    5. Comprehensive residential retrofit program
    6. Community Connections
    7. Residential new construction program
    8. Online energy audits
    9. No other programs were participated in
    98. Don’t know

25. Which of the following best describes your home?
    1. Single-family home, detached construction
    2. Single-family home, factory manufactured/modular
    3. Mobile home
    4. Row house
    5. Two or Three family attached residence
    6. Apartment with 4+ families
    7. Condominium
    97. Other (Specify)

26. Do you own or rent this residence?
    1. Own
    2. Rent

27. Approximately when was your homebuilt?
    1. Before 1960
    2. 1960-1969
    3. 1970-1979
    4. 1980-1989
    5. 1990-1999
    6. 2000-2005
    7. 2006 or Later
    98. Don’t know

28. Would you estimate the above-ground living space is about:
    1. Less than 1,000 square feet
    2. 1000-2000 square feet
    3. 2000-3000 square feet
    4. 3000-4000 square feet
    5. 4000-5000 square feet
    6. Greater than 5000 square feet
    98. Don’t Know

29. Would you estimate the below-ground living space is about:
    1. Less than 1,000 square feet
    2. 1000-2000 square feet
    3. 2000-3000 square feet
    4. 3000-4000 square feet
    5. 4000-5000 square feet
    6. Greater than 5000 square feet
    98. Don’t know

12.1.2 Behavioral Modification Program Non-Participant Survey

1. Did you participate in any of the following [NAME OF EDC] residential energy saving programs in 2013 that could help save you money? These include:

		Yes	No	DK	Refused
a.	CFL Retail Program 1	2	98	99	
b.	Residential Energy Audit Program	1	2	98	99
c.	Easy Cool Rewards Program	1	2	98	99
d.	Energy Efficient Products Program	1	2	98	99
e.	Appliance Turn-In Program	1	2	98	99
f.	Community Connections Program	1	2	98	99
g.	Home Energy Audit Program	1	2	98	99

2. Have you taken any of the following energy saving steps this year? Have you:

		Yes	No	DK	Refused
a.	Purchased any CFLs	1	2	98	99
b.	Added insulation to your home 1	2	98	99	
c.	Tuned up your central AC system	1	2	98	99
d.	Installed a high efficiency central AC system 1	2	98	99	
e.	Installed a new high efficiency heat pump	1	2	98	99
f.	Installed Energy Star windows 1	2	98	99	
g.	Installed a programmable thermostat	1	2	98	99
h.	Had a residential energy audit performed	1	2	98	99
i.	Purchased Energy Star home appliances[69]	1	2	98	99

3. Have you taken any other energy saving steps this year?
    1. Yes
    2. No
    98. Don't know
    99. Refused

[DISPLAY Q4 IF Q3 = 1]

4. Please describe what other energy saving steps you did this year.

5. Are you doing anything in particular this year to save energy in hot weather?
    1. Yes
    2. No
    98. Don't know
    99. Refused

[DISPLAY Q6 IF Q5 = 1]

[69] Includes Energy Star rated clothes washers, refrigerators, room AC units, dehumidifiers as well as energy saving surge protectors and torchiere floor lamps.

6. What do you do? (Record verbatim response)

7. Are you doing anything in particular this year to save energy in cold weather?
    1. Yes
    2. No
    98. Don't know
    99. Refused

[DISPLAY Q8 IF Q7 = 1]

8. What do you do? (Record verbatim response)

[DISPLAY Q9 IF ANY ACTIONS HAVE BEEN TAKEN; OTHERWISE SKIP TO Q11]

9. Have you noticed any savings on your electric bill since you made these changes?
    1. Yes, my electric bill has decreased
    2. No, there does not seem to be a change in my electric bill
    3. Not sure or too soon to tell
    98. Don't know
    99. Refused

[DISPLAY Q10 IF Q9 = 1]

10. How satisfied are you with the savings you noticed on your electric bill since making these changes? Would you say you were Very Satisfied, Somewhat Satisfied, Neither Satisfied nor Dissatisfied, Somewhat Dissatisfied, or Very Dissatisfied?
    1. Very satisfied
    2. Somewhat satisfied
    3. Neither satisfied nor dissatisfied
    4. Somewhat dissatisfied
    5. Very dissatisfied
    98. Don't know
    99. Refused

I'd like to finish up by asking you some questions about your home.

11. Which of the following best describes your home? (Read list: options 01-07)
    1. Single-family home, detached construction
    2. Single-family home, factory manufactured/modular
    3. Mobile home
    4. Row house
    5. Two or Three family attached residence
    6. Apartment with 4+ families Condominium
    97. Other (Specify)
    98. Don't Know
    99. Refused

12. Do you own or rent this residence?
    1. Own
    2. Rent
    98. Don't Know
    99. Refused

13. Approximately when was your home built? (Do not read response options)
    1. Before 1960
    2. 1960-1969
    3. 1970-1979
    4. 1980-1989
    5. 1990-1999
    6. 2000-2005
    7. 2006 or Later
    98. Don't know
    99. Refused

14. Would you estimate the above-ground living space is about:
    1. Less than 1,000 square feet
    2. 1000-2000 square feet
    3. 2000-3000 square feet
    4. 3000-4000 square feet
    5. 4000-5000 square feet
    6. Greater than 5000 square feet
    98. Don't know
    99. Refused

15. Do you have any below-ground living space such as a converted basement?
    1. Yes
    2. No
    98. Don't know
    99. Refused

[DISPLAY Q16 IF Q15 = 1]

16. Would you estimate the below-ground living space is about:
    1. Less than 1,000 square feet
    2. 1000-2000 square feet
    3. 2000-3000 square feet
    4. 3000-4000 square feet
    5. 4000-5000 square feet
    6. Greater than 5000 square feet
    98. Don't know
    99. Refused

That's all the questions I have. Thank you for your time. Good bye.