Evaluation of
2012 Home Energy Analyzer Program

Final Report

Prepared for FirstEnergy Ohio Companies:

The Cleveland Electric Illuminating Company

Ohio Edison Company

The Toledo Edison Company

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Table of Contents

List of Tables

1 Executive Summary

During 2012, the Ohio operating companies The Cleveland Electric Illuminating Company (CEI), Ohio Edison Company (OE), and The Toledo Edison Company (TE), (collectively the "Companies") continued to offer the Home Energy Analyzer (HEA) Program. An evaluation of the 2012 HEA program was conducted that had three main components.

- *Impact Evaluation*. The energy savings of the 2012 HEA 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 HEA program in 2010 and 2011 were analyzed to determine the extent to which their savings persisted into 2012. Surveys were also used to examine the persistence of the 2010 and 2011 cohort and to identify the actions they had taken to save energy.

Participants in the 2012 HEA 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 or through a utility bill insert. An online audit user receives 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 20,065 customers participated in the HEA program in 2012.

- Of these customers, 15,112 (75 percent) conducted online audits. Just over a third (37 percent) of the online participants conducted level 2 or 3 audits.
- There were 4,953 customers (25 percent of all participants) who participated in telephone audits. Nearly all (98 percent) of the telephone audit participants conducted Level 2 or 3 audits.

As shown in Table 1-1, verified ex post electric savings were 5,535,275 kWh for all home energy audits combined. Of the total kWh savings, 3,533,792 kWh (63.8 percent) were from online audits and 2,001,482 kWh (36.2 percent) were from telephone audits. Realization rates for

electric savings were 136.8 percent for online audits, 102.1 percent for telephone audits, and 121.8 percent overall. Table 1-1 also shows that verified critical peak demand reduction was 1,687.2 kW. Of the total demand reduction, 944.4 kW (56 percent) was from online audits and 742.8 kW (44 percent) was from telephone audits. Table 1-2 shows program-level *ex post* savings by audit type for each operating company and for the three companies combined.

Table 1-1. Summary of Annualized Energy and Demand Savings Impacts

	Ex Ante Savings		Ex Post Savings	
	kWh	kW	kWh	kW
Savings by Utility Company				
CEI	1,074,208	223.0	1,374,702	406.0
OE	2,849,649	595.3	3,304,853	984.8
TE	619,359	128.1	855,721	296.4
Savings by Type of Audit				
Online Audits	2,583,421	560.2	3,533,792	944.4
Telephone Audits	1,959,795	386.2	2,001,482	742.8
Savings for All Audits				
All Audits	4,543,216	946.4	5,535,275	1,687.2

Table 1-2. Ex Post Program-Level Savings (kWh) and kW Reductions by Operating Company and Audit Method

CEI			
	Telephone	**Online**	**All Audits**
Total kWh Saved	515,457	859,244	1,374,702
Total kW Reduced	184.9	221.2	406.0
OE			
	Telephone	**Online**	**All Audits**
Total kWh Saved	1,139,878	2,164,975	3,304,853
Total kW Reduced	416.1	568.7	984.8
TE			
	Telephone	**Online**	**All Audits**
Total kWh Saved	346,148	509,573	855,721
Total kW Reduced	141.8	154.6	296.4
Totals for All Three Companies			
	Telephone	**Online**	**All Audits**
Total kWh Saved	2,001,482	3,533,793	5,535,275
Total kW Reduced	742.8	944.4	1,687.2

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 Home Energy Analyzer software.

2 Introduction

Under contract with the Companies, ADM Associates, Inc. (ADM) performed evaluation, measurement, and verification (EM&V) services to determine and verify the savings being realized through the Home Energy Analyzer program in 2012. This document is the final report on the EM&V for the 2012 HEA program.

The evaluation of the 2012 HEA program had three main components.

- **Impact Evaluation**. The energy savings of the 2012 HEA 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 HEA program in 2010 and 2011 were analyzed to determine the extent to which their savings persisted through 2012. Surveys were also used to examine the persistence of the actions taken to save energy by 2010 and 2011 HEA participants.

The impact evaluation addressed the following research questions.

- To what extent has the Home Energy Analyzer 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 and 2011 into 2012?
- 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 and 2011 through 2012. 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 HEA program during 2010 and 2011 persisted through 2012. Surveys were also used to collect information with which to examine the persistence of the actions taken to save energy by 2010 and 2011 HEA participants (i.e., to determine the extent to which customers who initiated energy saving actions in 2010 and 2011 continued with those practices through 2012).

3 Description of 2012 HEA Program

This chapter provides a description of the 2012 Home Energy Analyzer program and summarizes data on program participation

3.1 DESCRIPTION OF PROGRAM

The Home Energy Audit (HEA) 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.

3.1.1 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 Home Energy Analyzer, 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. A Level 3 Home Energy Analysis Report is more detailed than a Level 2 Report

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.

3.1.2 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 either can provide the conservation and savings findings over the telephone or can print and mail a report to the customer. 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 1 or 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 PARTICIPATION IN 2012 HEA PROGRAM

A combined total of 20,065 customers participated in the HEA program in 2012. Table 3-1 shows how the numbers of customers who participated were distributed by operating company and by type and level of audit. Over three-fourths of the audits performed during the 2012 HEA program were performed on-line.

Table 3-1. Participation Levels for 2012 HEA Program by Utility and 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	2,670	1,249	3,919	20	1,243	1,263	5,182
OE	5,465	3,732	9,197	71	2,825	2,896	12,093
TE	1,324	672	1,996	23	771	794	2,790
Total Program	9,459	5,653	15,112	114	4,839	4,953	20,065

Note. Participation counts are for January 1 through December 31, 2012.

4 Evaluation Methodology

This chapter describes the methods used in the evaluation of the 2012 HEA program. Addressed in turn are the methods used for (1) the impact evaluation, (2) the process evaluation, and (3) the persistence analysis.

4.1 METHODS FOR IMPACT EVALUATION

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 HEA 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.

4.1.1 Specification for Regression Modeling

To determine the savings resulting from the 2012 HEA 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:

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

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:

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

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

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

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:

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

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.

4.1.2 Preparation of Billing and Weather Data

The Companies provided ADM with billing data on monthly electricity use for participants in the HEA program who had initiated a home energy audit either online or by telephone during 2012. These data included:

- Monthly kWh consumption billed for each customer for 24 months (January 2011 – December 2012);
- 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 23 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 2012 HEA participants in other residential energy conservation programs of the Companies. Estimated impacts of the HEA 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 HEA participants with dual enrollments. The residential conservation programs that were considered in this flagging exercise were the following:

- Easy Cool Rewards Program (rebates for programmable thermostats)
- Energy Efficient Products Program
    - HVAC Tune-ups and Rebates (part of the Energy Efficient Products Program)
    - Residential Energy Audits (part of the Energy Efficient Products Program)

- CFL Retail Program
- Comprehensive Residential Retrofit Program
- Community Connections (Low-Income) Program
- Residential New Construction 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 10,841 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 HEA 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 14,171 customers.

4.1.3 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[1], 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

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

that captures the effects of all the determinants of that customer's electricity use that are constant over time. This approach automatically 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 Home Energy Analyzer 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 (2006). This procedure was implemented using Stata, with customer ID being used as a variable for the *absorb* option in the *areg* regression command.[2]

4.1.4 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.
- 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.

[2] 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.

4.1.5 Method for Calculating kW Reductions

The calculation of kW reductions is based on the per-participant kWh savings values, as calculated per the discussion in Section 4.1.4. The steps in the calculation of kW reductions are as follows.

- 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.[3]
- 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.

4.1.6 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 HEA program on energy use persisted over time. This analysis addressed persistence of savings for the 2010 and 2011 cohorts of program participants.

As discussed in Section 4.1.4, each cohort can be divided into four groups, defined by type and level of audit. Using the regression model specification described in Section 4.1.1 (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 2012.

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

[3] 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.

2012 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.

4.2 METHODS FOR PROCESS EVALUATION

The process evaluation of the 2012 HEA 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:

- 2012 online audit participants
- 2012 telephone audit participants
- 2012 comparison group customers

4.2.1 Collection of Data for 2012 Online Audit Participants

Data were collected from two random samples of 2012 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 4-1.

Table 4-1. Sampling Plan for Survey of 2012 HEA Online Audit Participants

Utility Company	*Sampling Proportion*	*Level 1 Audit*	*Level 2/3 Audit*	*Sample Size (Completes)*
OE	.60	n = 42	n = 42	n = 84
CEI	.26	n = 18	n = 18	n = 36
TE	.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 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 2012 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.

4.2.2 Collection of Data for 2012 Telephone Audit Participants

Data was collected from a random sample of 2012 HEA 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 4-2.

Table 4-2. Sampling Plan for Survey of Telephone Audit Participants

Utility Company	***Sampling Proportion***	***Sample Size (Completes)***
CEI	.26	n = 18
OE	.60	n = 42
TE	.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.

4.2.3 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 HEA program in 2010, 2011 or 2012. 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 4-3.

Table 4-3. Sampling Plan for Survey of Non-Participants

Utility Company	*Sampling Proportion*	*Control Sample*
CEI	.26	n = 36
OE	.60	n = 84
TE	.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 2012 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.

4.2.4 Analysis of Survey Data for 2012 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).

4.3 METHODS FOR PERSISTENCE ANALYSIS

This section describes the methods used to analyze the persistence of savings for customers who participated in the HEA program in either 2010 or 2011.

4.3.1 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 and 2011 HEA programs were updated with 2012 billing data.

The persistence analysis compares energy consumption for the samples of 2010 and 2011 HEA participants with their consumption for the 12 months prior to their audit. The amount of persistence data available depends on the time of year in 2010 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 2012 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 or 2011 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).

4.3.2 Survey Data Collection for Persistence Analysis

Additional data with which to analyze the persistence of savings from customers who participated in the HEA Program in 2010 and 2011 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 HEA program in 2010 and 2011
- Telephone audit participants in the HEA program in 2010 and 2011

4.3.2.1 Survey Data Collection Procedures

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

Table 4-4. Sampling Plan for Persistence Survey

	2010 HEA Participants		***2011 HEA Participants***	
	Telephone Audits	***Online Audits***	***Telephone Audits***	***Online Audits***
Sample sizes	n = 80	n = 115	n = 67	n = 133

The persistence surveys with 2010 and 2011 participants in the HEA 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 or 2011 were still in place or were continuing to be practiced by these customers in 2012. 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?

4.3.2.2 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 or 2011 had persisted through 2012. For online audit savers, persistence rates for behavioral and structural changes were compared by audit level.

5 Detailed Evaluation Findings

This chapter presents and discusses the findings from the impact and process evaluation of the 2012 Home Energy Analyzer program and the analysis of persistence of savings for participants in the HEA program from 2010 and 2011.

5.1 FINDINGS FROM IMPACT EVALUATION OF 2012 HEA PROGRAM

This section presents and discusses the results from the regression analysis and the application of those results to determine the savings from the 2012 HEA program.

5.1.1 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 5-1. Definitions for the variables in the model are provided in Table 5-2.

Table 5-1. Results of Regression Analysis of Billing Data for Models Used to Estimate kWh Savings for Participants in the 2012 HEA Program

Variable	*Comparison Group*	*Telephone Level 1*	*Telephone Levels 2/3*	*Online Level 1*	*Online Levels 2/3*
Constant	15.89***	15.43***	20.97***	19.07***	20.12***
	(0.0893)	(1.860)	(0.328)	(0.223)	(0.252)
Heating degree-days (HDD) per day for billing period	0.406***	0.355***	0.485***	0.569***	0.522***
	(0.00311)	(0.0634)	(0.0110)	(0.00749)	(0.00853)
Cooling degree-days (CDD) per day for billing period	2.5280***	2.132***	2.821***	3.384***	3.199***
	(0.0168)	(0.351)	(0.0609)	(0.0414)	(0.0480)
Post	-1.0790***	1.415	-0.109	1.205***	0.587
	(0.143)	(2.667)	(0.438)	(0.309)	(0.363)
Post * HDD per day for billing period	0.0204***	-0.0254	-0.0415***	-0.0778***	-0.0608***
	(0.00593)	(0.103)	(0.0160)	(0.0111)	(0.0135)
Post * CDD per day for billing period	-0.0739***	-0.357	-0.602***	-0.551***	-0.411***
	(0.0244)	(0.471)	(0.0766)	(0.0535)	(0.0638)
Mean of dependent variable	27.497	25.813	33.702	34.950	34.868
Number of customers	14,171	48	2,498	5,076	3,219
Number of observations	338,332	1,051	54,794	111,997	70,930
R-squared	0.6700	0.6043	0.6407	0.6437	0.6438
Root mean squared error	12.8546	13.8317	15.9650	15.8228	15.0417

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

Table 5-2. 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

5.1.2 kWh Savings and kW Reductions for Participants in 2012 HEA Program

The results from the regressions reported in Table 5-1 were used to determine annual kWh savings and kW reductions per participant for the 2012 HEA program. All coefficients of interest that were significant at the 90% confidence level were used for this purpose.

The regression results reported in Table 5-1 were used to determine weather-normalized differences in pre- and post-audit annual kWh for customers in the 2012 HEA program and in the comparison group. These weather-normalized values for differences in pre- and post-audit annual kWh are presented in Table 5-3 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 subtracting the difference in annual pre-post kWh for the comparison group from the difference in annual pre-post kWh for the particular audit category. For example, using the values reported in Table 5-3, annual kWh savings for a CEI customer receiving a Level 2 / 3 audit are calculated as 748.63 – 333.94 = 414.69 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 5-4.

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

Table 5-3. 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	16.313	2.283	28.28	27.37	333.94
Telephone, Level 1	16.313	2.283	26.09	26.09	0
Telephone, Level 2 / 3	16.313	2.283	35.32	33.27	748.63
Online, Level 1	16.313	2.283	36.08	34.75	482.45
Online, Levels 2 / 3	16.313	2.283	35.94	34.01	704.42
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	17.199	2.069	28.10	27.22	321.59
Telephone, Level 1	17.199	2.069	25.95	25.95	0
Telephone, Level 2 / 3	17.199	2.069	35.15	33.19	715.19
Online, Level 1	17.199	2.069	35.86	34.59	464.72
Online, Levels 2 / 3	17.199	2.069	35.72	33.82	692.09
TE					
	HDD per Day	***CDD per Day***	***Daily kWh, Pre***	***Daily kWh, Post***	***Difference in Annual Pre-Post kwh***
Comparison	17.273	2.280	28.67	27.77	326.73
Telephone, Level 1	17.273	2.280	26.42	26.42	0
Telephone, Level 2 / 3	17.273	2.280	35.78	33.69	762.69
Online, Level 1	17.273	2.280	36.61	35.22	509.27
Online, Levels 2 / 3	17.273	2.280	36.43	34.44	725.39

Table 5-4. Annual kWh Savings per Customer for 2012 HEA 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	414.69	393.60	435.95	404.94
Online, Level 1	148.51	143.14	182.53	150.00
Online, Level 2 / 3	370.48	370.51	398.66	374.41

Weighted average across utilities calculated using weights based on percentages of 2012 HEA participants coming from different utilities (i.e., 25.8 percent from CEI, 60.3 percent from OE, and 13.9 percent from TE.

Table 5-5. 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
Telephone, Level 1	0	0	0
Telephone, Level 2 / 3	0.1487	0.1473	0.1839
Online, Level 1	0.0401	0.0399	0.0580
Online, Level 2 / 3	0.0913	0.0940	0.1157

Weighted average across utilities calculated using weights based on percentages of 2012 HEA participants coming from different utilities, per Table 5-4.

5.1.3 Program-Level kWh Savings

Program-level savings for the 2012 HEA program were determined by multiplying the per audit savings results from Table 5-4 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 5-6. Total kWh savings for the 2012 HEA program were determined to be 5,535,275 kWh.

Table 5-6. Program-Level Electric Energy Savings (kWh) for 2012 HEA 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	0	414.69	148.51	370.48	
Number of participants	20	1,243	2,670	1,249	5,182
Total kWh saved	0	515,457	396,517	462,727	1,374,702
OE					
	Telephone Level 1	Telephone Level 2/3	Online Level 1	Online Level 2/3	Totals
kWh saved per participant	0	393.60	143.14	370.51	
Number of participants	71	2,896	5,465	3,732	12,093
Total kWh saved	0	1,139,878	782,246	1,382,729	3,304,853
TE					
	Telephone Level 1	Telephone Level 2/3	Online Level 1	Online Level 2/3	Totals
kWh saved per participant	0	435.95	182.53	398.66	
Number of participants	23	794	1,324	672	2,790
Total kWh saved	0	346,148	241,674	267,899	855,721
Combined Totals across Utilities					
	Telephone Level 1	Telephone Level 2/3	Online Level 1	Online Level 2/3	Totals
Number of participants	114	4,953	9,459	5,653	20,056
Total kWh saved	0	2,001,482	1,420,437	2,113,355	5,535,275

5.1.4 Program-Level Critical Peak Demand Impacts

Program-level critical peak demand impacts for the 2012 HEA program were determined by applying the per audit kW reduction values from Table 5-5. The program-level kW reductions by utility and type and level of audit are shown in Table 5-7. Total kW reductions for the 2012 HEA program were determined to be about 1,687 kW.

Table 5-7. 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	0.1487	0.0401	0.0913	
Number of participants	20	1,243	2,670	1,249	5,182
Total kW reduction	0	184.9	107.1	114.0	406.0
OE					
	Telephone Level 1	***Telephone Level 2/3***	***Online Level 1***	***Online Level 2/3***	***Totals***
kW reduction per participant	0	0.1473	0.0399	0.0940	
Number of participants	71	2,825	5,465	3,732	12,093
Total kW reduction	0	416.1	217.9	350.8	984.8
TE					
	Telephone Level 1	***Telephone Level 2/3***	***Online Level 1***	***Online Level 2/3***	***Totals***
kW reduction per participant	0	0.1839	0.0580	0.1157	
Number of participants	23	771	1,324	672	2,790
Total kW reduction	0	141.8	76.8	77.8	296.4
Combined Totals across Utilities					
	Telephone Level 1	***Telephone Level 2/3***	***Online Level 1***	***Online Level 2/3***	***Totals***
Number of participants	114	4,839	9,459	5,653	20,065
Total kW reduction	-	742.8	401.8	542.6	1,687.2

5.2 FINDINGS FROM PROCESS EVALUATION OF 2012 HEA PROGRAM

This section reports findings from the process evaluation of the HEA Program. Findings are based on survey responses from samples of customers who participated in the HEA program in 2010, 2011 or 2012. The findings also draw on survey responses from two samples of nonparticipants. Table 5-7 shows the number of completions for each survey group.

As indicated in Table 5-8, the process evaluation's findings are based on the results of five telephone surveys administered to 288 of the Companies' customers. Two surveys were administered to 420 participants from Cohort 1 (2010) of the HEA program; two surveys were administered to 210 participants from Cohort 2 (2011) of the HEA program; and two control

surveys were administered to 140 nonparticipants matched to the online and telephone audit participant samples.

Table 5-8. Surveys Completed for Process Evaluation of 2012 HEA Program

Survey Group	Surveys Completed
Online audits, Level 1	70
Online audits, Level 2 / 3	73
Telephone audits, all levels	75
Non-participant comparison group	140
Total	288

5.2.1 Process Evaluation Findings

This section presents findings from the surveys that address several 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?

5.2.1.1 Characteristics of Dwellings for 2012 HEA Program Participants

As background for the process evaluation, tabulations were prepared to compare the characteristics of the dwellings of participants in the 2012 HEA program to those of non-participants. These comparisons are provided in Tables 5-9, 5-10, 5-11 and 5-12.

Table 5-9. Type of Dwelling Occupied by 2012 HEA Program Participants

Type of Dwelling	Telephone Audit	Online Audit Level 1	Online Audit Level 2 / 3	Non-Participant Comparison
Single-family home, detached construction	66.7%	65.7%	72.6%	72.9%
Single-family home, factory manufactured/modular	5.3%	5.7%	1.4%	5.0%
Mobile home	1.3%	2.9%	1.4%	2.1%
Row house	1.3%	0.0%	0.0%	0.7%
Two or Three family attached residence	5.3%	1.4%	1.4%	6.4%
Apartment with 4+ families	12.0%	10.0%	15.1%	7.1%
Condominium	4.0%	7.1%	2.7%	5.0%
Other	4.0%	7.1%	5.5%	0.7%
Totals	100%	100%	100%	100%
Sample sizes	n = 75	n = 70	n = 73	n =140

Table 5-10. Is Dwelling Occupied by 2012 HEA Program Participants Owned or Rented

Owned or Rented?	Telephone Audit	Online Audit Level 1	Online Audit Level 2 / 3	Non-Participant Comparison
Owned	68.0%	72.9%	72.6%	78.6%
Rented	30.7%	27.1%	27.4%	20.0%
Did not know	1.3%			0.7%
Did not answer				0.7%
Totals	100%	100%	100%	100%
Sample sizes	n = 75	n = 70	n = 73	n =140

Table 5-11. Year That Dwelling Occupied by 2012 HEA Program Participants Was Built

Year Dwelling Was Built	Telephone Audit	Online Audit Level 1	Online Audit Level 2 / 3	Non-Participant Comparison
Before 1960	32.0%	30.0%	26.0%	40.7%
1960-1969	9.3%	11.4%	16.4%	6.4%
1970-1979	8.0%	11.4%	17.8%	17.9%
1980-1989	5.3%	8.6%	6.9%	7.9%
1990-1999	8.0%	17.1%	11.0%	10.0%
2000-2005	9.3%	8.6%	8.2%	5.0%
2006 or Later	14.7%	1.4%	5.5%	0.7%
Did not know	13.3%	11.4%	8.2%	10.7%
Did not answer				0.7%
Totals	100%	100%	100%	100%
Sample sizes	n = 75	n = 70	n = 73	n =140

Table 5-12. Size of Dwelling Occupied by 2012 HEA 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	10.7%	12.9%	21.9%	11.4%
1,000-2,000 square feet	50.7%	40.0%	45.2%	38.6%
2,000-3,000 square feet	18.7%	24.3%	17.8%	21.4%
3,000-4,000 square feet	4.0%	7.1%	4.1%	2.1%
4,000-5,000 square feet	0.0%	1.4%	1.4%	0.7%
More than 5,000 square feet	1.3%	2.9%	2.7%	0.7%
Don't know	14.7%	11.4%	6.9%	25.0%
Totals	100%	100%	100%	100%
Sample sizes	n = 75	n = 70	n = 73	n =140

5.2.1.2 Customers' Experience in Receiving Telephone Audits through 2012 HEA Program

About a fourth of the customers who participated in the 2012 HEA 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 nearly two-thirds (65.3 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 5-13.

Table 5-13. 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	44.0%
Answer questions about home appliances	32.0%
Find out about top 3 home energy uses	22.7%
Offered literature about saving energy at home	22.7%
Discussion of something else	20.0%
Did not recall	17.3%
Sample size	n = 75

Table 5-14 shows how telephone audit customers rated the helpfulness of the information they received in their discussions with the customer service representatives.

Table 5-14. 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	17.3%
Somewhat helpful	33.3%
Neither helpful nor unhelpful	18.7%
Somewhat unhelpful	5.3%
Not at all helpful	17.3%
Did not know / did not recall	8.0%
Sample size	n = 75

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 5-15.

Table 5-15. 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	21.3%
Six-pack of Energy-Saving CFL Light Bulbs	4.0%
PC link to Home Energy Analyzer software	0.0%
Other	68.0%
Nothing was sent	10.7%
Sample size	n = 75

Table 5-16 shows how customers rated the helpfulness of the information they were sent.

Table 5-16. 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	6.3%
Somewhat helpful	50.0%
Neither helpful nor unhelpful	25.0%
Somewhat unhelpful	6.3%
Not at all helpful	12.5%
Did not know / did not recall	0.0%
Sample size	n = 75

Table 5-17 shows the percentages of telephone audit participants in the 2012 HEA program who reported making energy saving changes after the audit. Customers were more likely to report taking behavioral actions than structural actions.

Table 5-17. Percentages of Telephone Audit Participants in 2012 HEA Program Taking Different Types of Energy Saving Actions

Type of Energy Saving Action	***Telephone Audit***
Structural (Equipment)	8.0%
Behavioral	25.3%
Both Structural & Behavioral	2.7%
No Changes Made	56.0%
Did not know / did not recall	0.0%
Sample Sizes	n=75

Table 5-18 shows how telephone audit participants rated their satisfaction with the analysis that was provided to them through the telephone audit.

Table 5-18. How Telephone Audit Participants Rated Their Satisfaction with the Analysis They Received through Telephone Audit

Level of Satisfaction	***Telephone Audit***
Very satisfied	13.3%
Somewhat satisfied	24.0%
Neither satisfied nor dissatisfied	33.3%
Somewhat dissatisfied	5.3%
Very dissatisfied	20.0%
Did not know	4.0%
Sample Sizes	n=75

5.2.1.3 Customers' Experience in Receiving Online Audits through 2012 HEA Program

About three-fourths of the customers who participated in the 2012 HEA 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 5-19 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 or through bill inserts.

Table 5-19. Means by Which Customers Became Aware of the Home Energy Analyzer

Source of Awareness for Home Energy Analyzer	***Online Audit Level 1***	***Online Audit Level 2 / 3***	***All Online Audit***
Bill Insert	22.9%	38.4%	30.8%
Company website	40.0%	49.3%	44.8%
Energy Save Ohio Website	4.3%	8.2%	6.3%
Print/Newspaper Ad	1.4%	0.0%	0.7%
Radio/TV Ad	0.0%	0.0%	0.0%
Word of Mouth	7.1%	1.4%	4.2%
Other	27.1%	12.3%	19.6%
Total	n = 70	n = 73	n = 143

The reasons that customers gave for using the online energy audit software are reported in Table 5-20. 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 5-20. Reasons Why Customers Used Online Home Energy Analyzer

Reasons for Using Home Energy Analyzer	Online Audit Level 1	Online Audit Level 2 / 3	All Online Audit
Investigate	30.0%	38.4%	34.3%
Financial (high bill)	35.7%	35.6%	35.7%
Conserve energy	38.6%	48.0%	43.4%
Other	8.6%	1.4%	4.9%
Did not know / did not recall	15.7%	12.3%	14.0%
Total	n = 70	n = 73	n = 143

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 5-21 shows the percentages of participants who used different activities during an online audit.

Table 5-21. 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	40.0%	41.1%	40.6%
Answer questions about home appliances	25.7%	39.7%	32.9%
Answer questions about weatherizing home	15.7%	24.7%	20.3%
Obtain detailed energy saving ideas for home	34.3%	57.5%	46.2%
Sample Size	n = 70	n = 73	n = 143

As shown in Table 5-21, nearly half of the customers used the online *Home Energy Analyzer* 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 5-22. Percentages of Customers Provided Different Types of Energy Savings Ideas through Online Home Energy Analyzer

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	25.7%	46.6%	36.4%
Ways to save energy that require investment but will pay off	12.9%	19.2%	16.1%
Ways to save energy that would not be cost-justified	7.1%	15.1%	11.2%
Other ways to save energy	4.3%	11.0%	7.7%
Sample sizes	n = 70	n = 73	n = 143

Table 5-23 shows how customers rated the helpfulness of the information they received through their use of the *Home Energy Analyzer*.

Table 5-23. How Online Audit Participants Rated Helpfulness of Information They Received through Home Energy Analyzer

How Helpful Was Information Provided to You by Home Energy Analyzer	Online Audit Level 1	Online Audit Level 2 / 3	All Online Audit
Very helpful	5.7%	20.6%	13.3%
Somewhat helpful	58.6%	50.7%	54.6%
Neither helpful nor unhelpful	12.9%	6.9%	9.8%
Somewhat unhelpful	2.9%	5.5%	4.2%
Not at all helpful	0.0%	4.1%	2.1%
Did not know / did not recall	20.0%	12.3%	16.1%
Sample sizes	n = 70	n = 73	n = 143

Table 5-24 shows the percentages of online audit participants in the 2012 HEA program who reported making energy saving changes after the audit. Customers were more likely to report taking behavioral actions than structural actions.

Table 5-24. Percentages of Participants in 2012 HEA 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)	14.3%	5.5%	9.8%
Behavioral	44.3%	54.8%	49.7%
Both Structural & Behavioral	10.0%	16.4%	13.3%
No Changes Made	22.9%	27.4%	25.2%
Did not know / did not recall	20.0%	6.9%	13.3%
Sample Sizes	n=70	n=73	n = 143

Table 5-25 shows how online audit participants rated their satisfaction with the HEA program.

Table 5-25. How Online Audit Participants Rated Their Satisfaction with HEA Program

Level of Satisfaction	Online Audit Level 1	Online Audit Level 2 / 3	All Online Audits
Very satisfied	12.9%	19.2%	16.1%
Somewhat satisfied	34.3%	41.1%	37.8%
Neither satisfied nor dissatisfied	28.6%	21.9%	25.2%
Somewhat dissatisfied	1.4%	1.4%	1.4%
Very dissatisfied	0.0%	4.1%	2.1%
Did not know	22.9%	12.3%	17.5%
Sample Sizes	n=70	n=73	n = 143

5.2.1.4 Actions Taken by HEA 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 5-26 shows how HEA participants compared to non-participants on taking actions to save energy.

Table 5-26. Percentages of Customers Who Reported Taking Particular Actions to Save Energy in Response to Hot or Cold Weather

	Telephone Audit Participants	***Online Audit Participants***	***Comparison Non-Participants***
Percentage doing particular things to save energy in hot weather	9.3%	32.2%	22.1%
Percentage doing did particular things to save energy in cold weather	18.7%	39.9%	37.9%
Sample sizes	n=75	n=143	n=140

5.3 FINDINGS FROM THE PERSISTENCE ANALYSIS

The third major aspect of the 2012 evaluation was to examine the degree to which the savings achieved by participants in the HEA program in 2010 and 2011 persisted through 2012.

5.3.1 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 HEA program was described in Section 4.1.6. 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 5-27.

- For the 2010 cohort, the ratios of energy use in 2012 to pre-audit energy use show a lowering of energy use for all audit groups except the online Level 1 group. Note, moreover, that the ratio of energy use for the 2012 comparison group to that for the 2010 comparison group is 102.7 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 92.2 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.

Table 5-27. Results of Applying Regression Analysis of Billing Data to Determine Persistence of Savings for Participants in the 2010 HEA Program

Type and Level of Audit	***Estimated Per-Customer Annual kWh Usage (Weather Normalized)***		***Ratio of Energy Use, 2012 to Pre-Audit***
	Pre-Audit	***In 2012***	
2010 Cohort			
Telephone, Level 1	14,166	14,070	99.3%
Telephone, Level 2&3	15,471	14,766	95.4%
Online, Level 1	12,431	12,502	100.6%
Online, Level 2&3	13,436	13,167	98.0%
2011 Cohort			
Telephone, Level 1	12,203	12,182	99.8%
Telephone, Level 2&3	12,345	12,304	99.7%
Online, Level 1	12,675	11,960	94.4%
Online, Level 2&3	13,206	12,586	95.3%
Comparison Groups			
Comparison Group		***Estimated Per-Customer Annual kWh Usage (Weather Normalized)***	
For 2010 Cohort		9,409	
For 2011 Cohort		10,483	
For 2012 Cohort		9,667	
Ratio, 2012 to 2010		102.7%	
Ratio, 2012 to 2011		92.2%	

5.3.2 Findings on Persistence from Survey Responses

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

Table 5-28 reports on actions that the surveyed customers reported taking in response to the audit they received. For both 2010 and 2011, 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 5-28. Percentages of Participants in 2010 or 2011 HEA Program Taking Different Types of Energy Saving Actions

Type of Energy Saving Action	***2010 HEA Participants***		***2011 HEA Participants***	
	Telephone Audits	***Online Audits***	***Telephone Audits***	***Online Audits***
Structural (Equipment)	5.0%	8.7%	3.0%	6.8%
Behavioral	10.0%	34.8%	23.9%	43.6%
Both Structural & Behavioral	7.5%	17.4%	13.4%	18.0%
No Changes Made	45.0%	24.3%	41.8%	18.0%
Did not know / did not recall	31.3%	13.9%	17.9%	13.5%
Did not respond	1.3%	0.9%	0.0%	0.0%
Sample sizes	n = 80	n = 115	n = 67	n = 133

Table 5-29 reports on the persistence of structural and behavioral changes for the various cohorts. For those customers taking actions, persistence rates are generally over 90 percent.

Table 5-29. Rates of Persistence for Structural and Behavioral Changes for Participants in 2010 or 2011 HEA Program

	2010 HEA Participants		***2011 HEA Participants***	
	Telephone Audits	***Online Audits***	***Telephone Audits***	***Online Audits***
Percent making structural changes	12.5%	26.1%	16.4%	24.8%
Percent still having structural changes in place	90.0%	96.7%	72.7%	93.9%
Percent making behavioral changes	17.5%	52.2%	37.3%	61.7%
Percent still following changed behavioral practices	92.9%	98.3%	96.0%	100.0%

6 Conclusions and Recommendations

This chapter provides conclusions and recommendations from the evaluation of the 2012 Home Energy Analyzer program.

6.1 CONCLUSIONS

A total of 20,065 customers participated in the HEA program in Ohio in 2012. 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 2012 HEA Program. We turn first to a summary of the major impact evaluation findings.

6.2 IMPACT EVALUATION FINDINGS

6.2.1 Electricity and Demand Savings

For all home energy audits combined in 2012, e*x ante* expected annual kWh savings were 4,543,216 kWh. The *ex post* verified annual electricity savings for all home energy audits combined in 2012 were 5,535,275 kWh. The ratio of ex post to ex ante total electricity savings yields an overall realization rate of about 122 percent for kWh savings for the 2012 HEA program.

For all home energy audits combined in 2012, *ex ante* expected critical peak demand kW reduction was 946.4 kW. The *ex post* verified critical peak kW reduction for all home energy audits combined in 2011 was 1,687.2 kW. The ratio of ex post to ex ante total demand reductions yields an overall realization rate of about 178 percent for kW reductions for the 2012 HEA program.

Table 6-1 shows program-level results for kWh savings and kW reductions for the 2012 HEA program for each of the Ohio Companies.

6.2.2 Audit Method Contributions to Electricity Savings

Of the total electricity savings, 3,533,793 kWh (64 percent) were from online audits and 2,001,482 kWh (36 percent) were from telephone audits.

Of the total demand reduction, 944.4 kW (56 Percent) were from online audits and 741.4 kW (44 Percent) were from telephone audits.

Table 6-1. Program-Level Savings (kWh) and kW Reductions by Utility and Audit Method

CEI			
	Telephone	***Online***	***All Audits***
Total kWh Saved	515,457	859,244	1,374,702
Total kW Reduced	184.9	221.2	406.0
OE			
	Telephone	***Online***	***All Audits***
Total kWh Saved	1,139,878	2,164,975	3,304,853
Total kW Reduced	416.1	568.7	984.8
TE			
	Telephone	***Online***	***All Audits***
Total kWh Saved	346,148	509,573	855,721
Total kW Reduced	141.8	154.6	296.4
Totals for All Three Companies			
	Telephone	***Online***	***All Audits***
Total kWh Saved	2,001,482	3,533,793	5,535,275
Total kW Reduced	742.8	944.4	1,687.2

6.2.3 Audit Level Contributions to Electricity Savings

Ex post verified kWh savings and kW reductions were achieved in 2012 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 63 percent engaged in a Level 1 audit and about 37 percent in a Level 2 or Level 3 audit. For participants using the telephone method, nearly all (about 98 percent) engaged in a Level 2 or Level 3 audit.

6.2.4 Persistence of Electricity Savings

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

6.3 PROCESS EVALUATION FINDINGS

6.3.1 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 2012, almost all customers receiving a telephone audit engaged in either Level 2 or 3 audits.

6.3.2 Differences between a Level 1 Audit and a Level 2/3 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 15,112 customers who received an online audit through the 2012 HEA program, just over a third (37 percent) received a Level 2 or 3 audit. Of the 4,953 customers who participated in telephone audits, nearly all (98 percent) received a Level 2 or 3 audits.

6.3.3 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 72.8 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 36 percent) of the telephone audit participants reported taking such actions.

6.3.4 Evidence of Persistence in Savings Actions

Both online and telephone audit participants who participated in the HEA program in 2010 and 2011 reported continuing into 2012 with the changes they had initially made as a result of their home energy audit experience.

6.4 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 Home Energy Analyzer software.

Appendix A:
Pro Rata Ex Post Savings and Lifetime Savings

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

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

The same methodology applies to kW savings.

The program lifetime has been determined to be 2 years. Given the persistence analysis performed for this report, there is evidence of savings persisting over a period greater than one year. Based on current data, a two year lifetime is assumed. Lifetime savings are calculated as:

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

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

Table A-1. Pro Rata Ex Post Savings and Lifetime Savings

Utility	Number of Participants	Pro Rata Ex Post		Lifetime Ex Post	
		kWh	kW	kWh	kW
CEI	5,182	738,930	236.6	2,749,404	812.0
OE	12,093	1,853,085	659.6	6,609,706	1,969.6
TE	2,790	468,999	178.0	1,711,442	592.8
Combined	**20,065**	**3,061,014**	**1,074.2**	**11,070,552**	**3,374.4**

Appendix B:
Process Evaluation Survey Instruments

This appendix provides the instruments used for the process evaluation surveys.

Ohio Edison, The Illuminating Company and Toledo Edison

2012 Home Energy Audit Program
Phone Audit Participant Survey: Cohort 3

Customer Name: _____ Phone Number: _____/_____/_____

Customer Account Number: _____ Customer Zip Code: _____

Date of Interview: _____/_____/_____

EDC:

Ohio Edison …… 01

The Illuminating Company ……. 02

Toledo Edison …….. 03

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 with (NAME OF EDC) Customer Service Center in discussing your electric bill. May I to talk with you now about how things went with the Customer Service Center? This will only take about 10 minutes.

Yes ……01	PROCEED WITH INTERVIEW
No ……... 02	THANK RESPONDENT AND TERMINATE
Refused …… 99	THANK RESPONDENT AND TERMINATE

1. *Our records indicate that you called the Customer Service Center on _____ (month/date) 2012. Can you tell me why you called the Customer Service Center on that date? What were your concerns?*

High bill complaint……01
Other……....02
Don't know/don't recall…….. 98
Refused ……99

SPECIFY OTHER THEN CODE
RESPONSE:_____
_____
_____
_____
_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Investigate ……a
Conserve Energy ……..b
Meter……..c
Power Outtage.....d
Other……..e

2. *What did the Customer Service Center Representative discuss with you?* Did you …
ASK A-E

		Yes	***No***	***DK***	***Refused***
a.	Review changes in your bill/usage over time?	1	2	98	99
b.	Answer questions about your home appliances?	1	2	98	99
c.	Find out about your top 3 home energy uses?	1	2	98	99
d.	Get offered literature about saving energy at home?	1	2	98	99
e.	Discuss something else?	1	2	98	99
f.	Don't recall	1			

Specify *"something else" THEN CODE RESPONSE*:
_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Further financial conversation…….1
Discussed other conservation programs……..2
Other……3

3. *How helpful was the information provided over the phone? Would you say "Very Helpful, Somewhat Helpful, Neither Helpful nor Unhelpful, Somewhat Unhelpful, or Not at all Helpful"?*

Very Helpful ……...01
Somewhat Helpful ……..…..02
Neither Helpful nor Unhelpful…….03
Somewhat Unhelpful ……..……..04
Not at all Helpful ……..…..05
Don't Know/don't recall……98
Refused ……..…99

ASK Q4 IF Q3 = SOMEWHAT UNHELPFUL OR NOT HELPFUL

4. *What aspects of the of the phone conversation with Customer Service were not helpful? Why?*

RECORD VERBATIM THEN CODE RESPONSE:
_____
_____
_____
_____
_____

[DO NOT READ; INDICATE ALL THAT APPLY]

It did not provide me new or actionable information……1
Did not understand…….2
Don't know……...98
Refused ……99

5. *Did the Customer Service Representative send you any of the following?*
READ OPTIONS

	Yes	No	DK	Refused
a. Brochure(s) on Energy Saving Tips	1	2	98	99
b. Pack of 6 Energy-Saving CFL Light Bulbs	1	2	98	99
c. PC link to Home Energy Analyzer software	1	2	98	99
d. Other	1	2	98	99
e. Nothing was sent	1	2	98	99

Specify Other: _____

ASK Q6 IF Q5 = ENERGY SAVING TIPS SENT

6. *How helpful were the Energy Saving Tips? Would you say "Very Helpful, Somewhat Helpful, Neither Helpful nor Unhelpful, Somewhat Unhelpful, or Not at all Helpful"?*

Very Helpful ……...01
Somewhat Helpful …….....02
Neither Helpful nor Unhelpful…….03
Somewhat Unhelpful ……..04
Not at all Helpful …….....05
Don't Know/don't recall……98
Refused ……..…99

ASK Q7 IF Q5 = CFL LIGHT BULBS SENT

7. *How many of the CFL light bulbs have you installed?*

Number of CFLs installed (maximum of 6): _____
Don't know……...98
Refused ……99

ASK Q8 IF Q5 = LINK TO ENERGY ANALYZER SENT

8. *Have you viewed the Energy Analyzer from the link that was sent to you? If so, have you used it?*

Yes, I viewed but have not used it ……....01
Yes, I have viewed it and I have used it …….……..02
No, I have not viewed it.……03
Don't know…….....98

Refused ……..99

9. *What energy saving actions were you able to take, if any, as a result of your telephone call to the (NAME OF EDC) 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?*

*RECORD VERBATIM THEN CODE RESPONSE*_____
_____
_____
_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Structural (equipment) changes made……. 01
- Appliance……a
- HVAC…….b
- Lighting……..…..c
- General Response……d
- Water Heating……e
- Shell Measures……f

Behavioral changes made..…….. 02
- Appliance……a
- HVAC…….b
- Lighting……..…..c
- General Response……d
- Water Heating……e
- Shell Measures……f

Both structural and behavioral changes made…… ……..03
No energy saving changes made ……..04
Don't Know/don't recall ……..…….98
Refused ……99

ASK Q10- Q13 IF ***BEHAVIORAL*** *CHANGES MADE; OTHERWISE SKIP TO Q14*

10. *Do you do things differently now to save energy in* ***hot weather****?*

Yes ……..01
No…… ……02
Don't know ……..98
Refused ……..…..….99

11. (IF YES) What do you do differently now?
RECORD VERBATIM RESPONSE THEN CODE
*RESPONSE*_____

_____

_____

_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Appliance……..…….1
HVAC…….....2
Lighting……..3
General Response…….……..4
Water heating Measures…….5
Shell Measures…….6

*12. Do you do things differently now to save energy in **cold weather**?*

Yes ……..01
No…… ……02
Don't know ……..98
Refused ……..…..….99

13. (IF YES) What do you do differently now?
RECORD VERBATIM RESPONSE THEN CODE
*RESPONSE*_____

_____

_____

_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Appliance……..…….1
HVAC…….....2
Lighting……..3
General Response…….……..4
Water heating Measures…….5
Shell Measures…….6

*ASK Q14 IF **ANY CHANGES MADE**; OTHERWISE SKIP TO Q16*

14. Have you noticed any savings on your electric bill since you made these changes?

Yes, my electric bill has decreased ……..01
No, there does not seem to be a change in my electric bill …….02
Not sure or too soon to tell ……..……03
Don't know ……..98
Refused ……..…..….99

ASK Q15 IF Q14 = YES

15. *How satisfied are you with the savings you noticed on your electric bill since making these changes? Would you say you are "Very Satisfied, Somewhat Satisfied, Neither Satisfied nor Dissatisfied, Somewhat Dissatisfied, or Very Dissatisfied"?*

Very satisfied ……..01
Somewhat satisfied …….02
Neither satisfied nor dissatisfied ……..03
Somewhat dissatisfied …….04
Very dissatisfied ……..…….…05
Don't know ……..98
Refused ……..…99

16. *Overall, how satisfied are you with the Analysis performed by the (NAME OF EDC) Customer Service Center? Would you say you are "Very Satisfied, Somewhat Satisfied, Neither Satisfied nor Dissatisfied, Somewhat Dissatisfied, or Very Dissatisfied"?*

Very satisfied ……..01
Somewhat satisfied …….02
Neither satisfied nor dissatisfied ……..03
Somewhat dissatisfied …….04
Very dissatisfied ……..……..…05
Don't Know …….98
Refused ……99

17. *Why do you give it that rating?*

RECORD VERBATIM THEN CODE RESPONSE:

_____

_____

_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Financial Satisfaction…….1
HVAC…….2
Lighting……..…3

Generally
Satisfisfied……..……4
Neutral indefinite response……..……...5
Not Satisfied……6

18. Do you have any suggestions to improve the (NAME OF EDC) Analysis process?

Yes …… 01
No..…… 02
Don't Know ……98
Refused ……99

19. IF YES, RECORD VERBATIM THEN CODE RESPONSE:

_____

_____

_____

[DO NOT READ; INDICATE ALL THAT APPLY]

More Info is Needed……1
Better Tracking system……..……..2
Audit request……..3
General response…….4
Rebates should be offered…….…..5
More advertising or better communication is needed…6

I'd like to finish up by asking you some questions about your home.

20. Which of the following best describes your home? [READ LIST: OPTIONS 01-07]

Single-family home, detached construction……..01
Single-family home, factory manufactured/modular……02
Mobile home…….03
Row house…….04
Two or Three family attached residence……05
Apartment with 4+ families……06
Condominium…….07
Other……08
Don't Know ……98
Refused ……...99

Specify Other: _____

21. Do you own or rent this residence?

Own …… 01
Rent ..…….. .02

Don't Know ……..98
Refused ……99

22. *Approximately when was your home built?* [DO NOT READ RESPONSE OPTIONS]

Before 1960……01
1960-1969……..02
1970-1979……..03
1980-1989……..04
1990-1999……..05
2000-2005……..06
2006 or Later……..07
Don't know……98
Refused……...99

23. How many square feet is the above-ground living space?

Square Feet: _____
Don't know……98
Refused……...99

ASK Q24 IF Q23 = DON'T KNOW OR REFUSED

24. Would you estimate the above-ground living space is about:

Less than 1,000 square feet……..01
1000-2000 square feet……..02
2000-3000 square feet……..03
3000-4000 square feet……..04
4000-5000 square feet……..05
Greater than 5000 square feet……..06
Don't know……..98
Refused……99

25. How many square feet of below-ground living space is heated or air conditioned?

Square Feet: _____
Does not apply……88
Don't know……98
Refused……...99

[ASK 26 IF Q25 = DON'T KNOW OR REFUSED]

26. Would you estimate the below-ground living space is about:

Less than 1,000 square feet……..01
1000-2000 square feet……..02
2000-3000 square feet……..03
3000-4000 square feet……..04
4000-5000 square feet……..05
Greater than 5000 square feet……..06
Don't know……..98
Refused…….99

That's all the questions I have. Thank you for your time. Good bye.

Ohio Edison, The Illuminating Company and Toledo Edison

2012 Home Energy Audit Program
Online Audit Participant Survey: Cohort 3

Customer Name: _____ Phone Number: _____/_____/_____

Customer Account Number: _____ Customer Zip Code: _____

Date of Interview: _____/_____/_____

EDC:

Ohio Edison …… 01

Illuminating Company …… 02

Toledo Edison …….. 03

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 with (NAME OF EDC) online Home Energy Analyzer. Is now a good time to talk with you about your experience with the Home Energy Analyzer? This will only take about 10 minutes.

Yes ……01	PROCEED WITH INTERVIEW
No …….... 02	THANK RESPONDENT AND TERMINATE
Refused …… 99	THANK RESPONDENT AND TERMINATE

1. *First, could you tell me how you heard about the Home Energy Analyzer?* [DO NOT READ; INDICATE ALL THAT APPLY]

Bill Insert	01
Energy Save Ohio website	02
FirstEnergy utility website	03
Print/Newspaper Ad	04
Radio	05
Word-of-Mouth	06
Other (specify)	07

Specify Other: _____

4. *Our records indicate that you used the Home Energy Analyzer on _____ (month/date) 2012. Can you tell me why you decided to do an online home energy audit? What were your concerns?*

RECORD VERBATIM THEN CODE RESPONSE:

_____
_____
_____
_____
_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Investigate……..……..…..…1
Financial (high bills)……..……....2
Conserve Energy……..…….…….3
Other……..4
Don't know/don't recall…….. 98
Refused ……99

3. *Can you tell me what you did online with the Home Energy Analyzer?* Did you …
ASK A-E

		Yes	No	DK	Refused
g.	Review changes in your bill/usage over time?	1	2	98	99
h.	Answer questions about your home appliances?	1	2	98	99
i.	Answer questions about weatherizing your home?	1	2	98	99
j.	Get detailed energy saving ideas for your home?	1	2	98	99
k.	Do something else?	1	2	98	99
l.	Don't recall	1			

Specify *"something else"*:

_____

ASK Q4 IF DETAILED ENERGY SAVING IDEAS RECEIVED

10. What kind of detailed energy saving ideas did you receive? Did they involved:

		Yes	No	DK	Refused
a.	No-cost/low cost ways to save energy immediately?	1	2	98	99
b.	Ways to save requiring investment but will pay off?	1	2	98	99
c.	Ways to save that would not be cost-justified?	1	2	98	99
d.	Other ways to save?	1	2	98	99

Specify Other THEN CODE RESPONSE:

_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Adjust thermostat……..1
Turn off or unplug devices other than lights…….2
Turn off lights……3

Installed energy-efficient lighting…….4
Implemented energy-efficient equipment or measures (other than lighting; or undefined measures)……..5
No specific action was taken……6

5. *How helpful was the information provided by the Home Energy Analyzer? Would you say it was "Very Helpful, Somewhat Helpful, Neither Helpful nor Unhelpful, Somewhat Unhelpful, or Not at all Helpful"?*

Very Helpful ……...01
Somewhat Helpful …….....02
Neither Helpful nor Unhelpful…….03
Somewhat Unhelpful ……..……..04
Not at all Helpful …….....05
Don't Know/don't recall……98
Refused ……..…99

ASK Q6 IF Q5 = SOMEWHAT UNHELPFUL OR NOT HELPFUL

6. *What aspects were not helpful? Why?*

RECORD VERBATIM THEN CODE RESPONSE:

_____
_____
_____
_____
_____

[DO NOT READ; INDICATE ALL THAT APPLY]

It did not provide me new or actionable information……1
Did not understand it…….2
Don't know……...98
Refused ……99

7. *What aspect of the Home Energy Analyzer was most helpful to you? Why?*

RECORD VERBATIM THEN CODE RESPONSE:

_____
_____
_____
_____
_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Actionable ideas……1
Education…….……..2
Changed thermostat……...……3
Other or undefined responses……4
Don't know……...98
Refused ……99

14. What energy saving actions were you able to take, if any, as a result of using the Home Energy Analyzer?

*RECORD VERBATIM THEN CODE RESPONSE*_____
_____
_____
_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Structural changes taken……. 01
- Appliance…….a
- HVAC……..b
- Lighting……c
- General response……..d
- Water heating measures……e
- Shell measures……..f

Behavioral changes taken…….. 02
- Appliance…….a
- HVAC……..b
- Lighting……c
- General response……..d
- Water heating measures……e
- Shell measures……..f

Both structural and behavioral changes taken…… ……..03
No changes made yet……..04
Don't Know/don't recall ……..…….98
Refused ……99

*ASK Q9- Q12 IF **BEHAVIORAL** CHANGES MADE; OTHERWISE SKIP TO Q12*

*9. Do you do things differently now to save energy in **ho**t **weathe**r?*

Yes ……..01
No…… ……02
Don't know ……..98
Refused ……..…..….99

10. (IF YES) What do you do differently now?
*RECORD VERBATIM THEN CODE RESPONSE*_____
_____
_____
_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Appliance……1
HVAC ……2

Lighting……..3
General response……4
Water heating measures……..5
Shell measures……6

*11. Do you do things differently now to save energy in **cold weather**?*

Yes ……..01
No…… ……02
Don't know ……..98
Refused ……..…..….99

12. (IF YES) What do you do differently now?
*RECORD VERBATIM THEN CODE RESPONSE*_____
_____
_____
_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Appliance……1
HVAC ……2
Lighting……..3
General response……4
Water heating measures……..5
Shell measures……6

ASK Q13 IF ANY CHANGES HAVE BEEN MADE; OTHERWISE SKIP TO Q14

13. Have you noticed any savings on your electric bill since you made these changes?

Yes, my electric bill has decreased ……..01
No, there does not seem to be a change in my electric bill ……02
Not sure or too soon to tell ……..……03
Don't know ……..98
Refused ……..…..….99

[ASK Q14 IF Q13 = YES]

14. 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?

Very satisfied ……..01
Somewhat satisfied ……02
Neither satisfied nor dissatisfied ……..03

Somewhat dissatisfied …….04
Very dissatisfied ……..…05
Don't know ……..……..98
Refused ……..…99

15. *Overall, how satisfied are you with the (NAME OF EDC) Home Energy Audit Program? Would you say you are Very Satisfied, Somewhat Satisfied, Neither Satisfied nor Dissatisfied, Somewhat Dissatisfied, or Very Dissatisfied?*

Very satisfied ……..01
Somewhat satisfied …….02
Neither satisfied nor dissatisfied ……..03
Somewhat dissatisfied …….04
Very dissatisfied ……..……..…05
Don't Know …….98
Refused ……99

16. *Why do you give it that rating?*

RECORD VERBATIM THEN CODE RESPONSE:

_____

_____

_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Financial satisfaction……..1
HVAC…….2
Lighting……...3
Generally satisfied……...4
Neutral or indefinite response…….5
Not satisfied……...……..6

17. *Do you have any suggestions to improve the (NAME OF EDC) Home Energy Analyzer?*

Yes …… 01
No..…… 02
Don't Know …….98
Refused ……99

18. IF YES, RECORD VERBATIM THEN CODE RESPONSE:

_____

_____

_____

_____

[DO NOT READ; INDICATE ALL THAT APPLY]

More info is needed……..…1
Better Tracking system……..2
Audit Request……..……...3
General response……4
Water heating measures……5
Shell measures……6
Make it easier to use……..7
Make it easier to navigate……..8
Improve layout……...9

I'd like to finish up by asking you some questions about your home.

19. Which of the following best describes your home? (READ LIST: OPTIONS 01-07)

Single-family home, detached construction……..01
Single-family home, factory manufactured/modular……02
Mobile home……03
Row house……04
Two or Three family attached residence……05
Apartment with 4+ families……06
Condominium……07
Other……08
Don't Know ……98
Refused ……...99

Specify Other: _____

20. Do you own or rent this residence?

Own …… 01
Rent ..…… .02
Don't Know ……..98
Refused ……99

21. *Approximately when was your home built?* [DO NOT READ RESPONSE OPTIONS]

Before 1960……01
1960-1969……..02
1970-1979……..03
1980-1989……..04
1990-1999……..05
2000-2005……..06
2006 or Later……..07
Don't know……98
Refused……...99

22. How many square feet is the above-ground living space?

Square Feet: _____
Don't know……98
Refused……...99

ASK Q23 IF Q22 = DON'T KNOW OR REFUSED

23. *Would you estimate the above-ground living space is about:*

Less than 1,000 square feet……..01
1000-2000 square feet……..02
2000-3000 square feet……..03
3000-4000 square feet……..04
4000-5000 square feet……..05
Greater than 5000 square feet……..06
Don't know……..98
Refused……99

24. *How many square feet of below-ground living space is heated or air conditioned?*

Square Feet: _____
Does not apply……88
Don't know……98
Refused……...99

ASK Q25 IF Q24 = DON'T KNOW OR REFUSED

25. *Would you estimate the below-ground living space is about:*

Less than 1,000 square feet……..01
1000-2000 square feet……..02
2000-3000 square feet……..03
3000-4000 square feet……..04
4000-5000 square feet……..05
Greater than 5000 square feet……..06
Don't know……..98
Refused……99

That's all the questions I have. Thank you for your time. Good bye.

Ohio Edison, The Illuminating Company and Toledo Edison

2012 Home Energy Audit Program

Phone Audit Participant Survey: Cohort 1 or 2

Customer Name: _____ Phone Number: _____/_____/_____

Customer Account Number: _____ Customer Zip Code: _____

Date of Interview: _____/_____/_____

EDC:

Ohio Edison …… 01

The Illuminating Company …… 02

Toledo Edison …….. 03

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 with (NAME OF EDC) Customer Service Center. May I to talk with you now about how things went with the Customer Service Center? This will only take about 10 minutes.

Yes ……01	PROCEED WITH INTERVIEW
No ……... 02	THANK RESPONDENT AND TERMINATE
Refused …… 99	THANK RESPONDENT AND TERMINATE

12. *Our records indicate that you called the Customer Service Center on _____ (month/date) 2010 or 2011. Can you tell me why you called the Customer Service Center? What were your concerns?*

High bill complaint……01	PROCEED WITH INTERVIEW
Other……..02	PROCEED WITH INTERVIEW
Don't know/don't recall……98	THANK RESPONDENT AND TERMINATE
Refused ……99	THANK RESPONDENT AND TERMINATE

SPECIFY OTHER THEN CODE RESPONSE:_____

_____

_____

_____

_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Investigate ……1
Financial (high bills) ……..……..2
Conserve Energy ……...3
Meter……..4
Power Outtage.....5
Other……..6

13. W*hat did the Customer Service Center Representative discuss with you? Did you …*
ASK A-E;

		Yes	No	DK	Refused
m.	Review changes in your bill/usage over time?	1	2	98	99
n.	Answer questions about your home appliances?	1	2	98	99
o.	Find out about your top 3 home energy uses?	1	2	98	99
p.	Get offered literature about saving energy at home?	1	2	98	99
q.	Discuss something else?	1	2	98	99
r.	Don't recall	1	IF YES THANK RESPONDENT AND TERMINATE		

Specify *"something else" THEN CODE RESPONSE*:
_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Further financial conversation…….1
Discussed other conservation programs……..2
Other……3

29. How helpful was the information provided over the phone? Would you say "Very Helpful, Somewhat Helpful, Neither Helpful nor Unhelpful, Somewhat Unhelpful, or Not at all Helpful"?

Very Helpful ……....01
Somewhat Helpful …….....02
Not at all Helpful …….....03
Don't Know/don't recall……...98
Refused ……99

ASK Q4 IF Q3 = SOMEWHAT UNHELPFUL OR NOT HELPFUL

30. What aspects of the phone conversation with Customer Service were not helpful? Why?

RECORD VERBATIM THEN CODE RESPONSE:
_____
_____
_____
_____
_____

[DO NOT READ; INDICATE ALL THAT APPLY]

It did not provide me new or actionable information……1
Did not understand…….2
Don't know……...98
Refused ……99

31. *Did the Customer Service Representative send you any of the following?*
READ OPTIONS

	Yes	No	DK	Refused	
a. Brochure(s) on Energy Saving Tips	1	2	98	99	
b. Pack of 6 Energy-Saving CFL Light Bulbs		1	2	98	99
c. PC link to Home Energy Analyzer software	1	2	98	99	
d. Other	1	2	98	99	
e. Nothing was sent	1	2	98	99	

Specify Other: _____

ASK Q6 IF Q5 = ENERGY SAVING TIPS SENT

17. *How helpful were the Energy Saving Tips? Would you say "Very Helpful, Somewhat Helpful, Neither Helpful nor Unhelpful, Somewhat Unhelpful, or Not at all Helpful"?*

Very Helpful ……...01
Somewhat Helpful …….....02
Neither Helpful nor Unhelpful…….03
Somewhat Unhelpful ……..……..04
Not at all Helpful …….....05
Don't Know/don't recall……98
Refused ……..…99

ASK Q7 IFQ5 = CFL LIGHT BULBS SENT

18. *How many of the CFL light bulbs have you installed?*

Number of CFLs installed (maximum of 6): _____
Don't know……...98
Refused ……99

ASK Q8 IFQ5 = LINK TO ENERGY ANALYZER SENT

19. *Have you viewed the Online Energy Analyzer from the link that was sent to you? If so, have you used it?*

Yes, I viewed but have not used it ……....01
Yes, I have viewed it and I have used it ……..……..02
No, I have not viewed it.……03
Don't know…….....98

Refused ……..99

35. *What energy saving actions were you able to take, if any, as a result of your telephone call to the (NAME OF EDC) 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?*

*RECORD VERBATIM THEN CODE RESPONSE*_____
_____
_____
_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Structural (equipment) changes made……. 01
- Appliance……a
- HVAC…….b
- Lighting…….…..c
- General Response……d
- Water Heating……e
- Shell Measures……f

Behavioral changes made..…….. 02
- Appliance……a
- HVAC…….b
- Lighting…….…..c
- General Response……d
- Water Heating……e
- Shell Measures……f

Both structural and behavioral changes made…… ……..03
No energy saving changes made ……..04
Don't Know/don't recall ……..…….98
Refused ……99

ASK Q10 IF STRUCTURAL CHANGES WERE MADE

36. *How is that working out? Is the ___ (equipment/materials) that you purchased still installed?*

Yes, it's still installed……01
No, I removed it/took it out……..……..02
Don't Know……. ……..…….98
Refused ……..……99

ASK Q11 IF Q10 = YES

37. *How satisfied are you with your new ____ (equipment/materials)? Would you say you are "Very Satisfied, Somewhat Satisfied, Neither Satisfied nor Dissatisfied, Somewhat Dissatisfied, or Very Dissatisfied"?*

Very satisfied ……..01
Somewhat satisfied ……02
Neither satisfied nor dissatisfied ……..03
Somewhat dissatisfied ……04

Very dissatisfied ……..……..…05
Don't know ……..……..98
Refused ……..…99

*ASK Q12- Q16 IF **BEHAVIORAL** CHANGES MADE; OTHERWISE SKIP TO Q17*

*38. Do you do things differently now to save energy in **hot weather**?*

Yes ……..01
No…… ……02
Don't know ……..98
Refused ……..…..….99

(IF YES) What do you do differently now?
*RECORD VERBATIM THEN CODE RESPONSE*_____
_____
_____
_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Appliance……..…….1
HVAC…….....2
Lighting……..3
General Response…….……..4
Water heating Measures…….5
Shell Measures…….6

*39. Do you do things differently now to save energy in **cold weather**?*

Yes ……..01
No…… ……02
Don't know ……..98
Refused ……..…..….99

40. (IF YES) What do you do differently now?
*RECORD VERBATIM RESPONSE*_____
_____
_____
_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Appliance……..…….1
HVAC…….....2

Lighting……..3
General Response……..……..4
Water heating Measures…….5
Shell Measures…….6

41. Are you continuing to do that (the behavior change identified in Q10)?

Yes, behavior still practiced……01
No, I stopped doing that…...……..…….02
Don't Know……. ……..…….98
Refused ……..……99

ASK Q17 IF ANY CHANGES WERE MADE; OTHERWISE SKIP TO Q19

42. Have you noticed any savings on your electric bill since you made these changes?

Yes, my electric bill has decreased ……..01
No, there does not seem to be a change in my electric bill …….02
Not sure or too soon to tell ……..……03
Don't know ……..98
Refused ……..…….99

ASK Q18 IF Q17 = YES

43. How satisfied are you with the savings you noticed on your electric bill since making these changes? Would you say you are "Very Satisfied, Somewhat Satisfied, Neither Satisfied nor Dissatisfied, Somewhat Dissatisfied, or Very Dissatisfied"?

Very satisfied ……..01
Somewhat satisfied …….02
Neither satisfied nor dissatisfied ……..03
Somewhat dissatisfied …….04
Very dissatisfied ……..……..…05
Don't know ……..……..98
Refused ……..…99

44. *Overall, how satisfied are you with the Analysis performed by the (NAME OF EDC) Customer Service Center? Would you say you are "Very Satisfied, Somewhat Satisfied, Neither Satisfied nor Dissatisfied, Somewhat Dissatisfied, or Very Dissatisfied"?*

Very satisfied ……..01
Somewhat satisfied ……02
Neither satisfied nor dissatisfied ……..03
Somewhat dissatisfied ……04
Very dissatisfied ……..…05
Don't Know ……98
Refused ……99

45. *Why do you give it that rating?*

RECORD VERBATIM THEN CODE RESPONSE:

_____

_____

_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Financial Satisfaction…….1
HVAC…….2
Lighting……...…3
Generally Satisfisfied……..……4
Neutral indefinite response……..……...5
Not Satisfied……6

46. *Do you have any suggestions to improve the (NAME OF EDC) Analysis process?*

Yes ……. 01
No...…… 02
Don't Know ……98
Refused ……99

IF YES, RECORD VERBATIM THEN CODE RESPONSE:

_____

_____

_____

[DO NOT READ; INDICATE ALL THAT APPLY]

More Info is Needed……1
Better Tracking system……..……..2
Audit request……..3

General response…….4
Rebates should be offered…….…..5
More advertising or better communication is needed…6

I'd like to finish up by asking you some questions about your home.

47. Which of the following best describes your home? [READ LIST: OPTIONS 01-07]

Single-family home, detached construction……..01
Single-family home, factory manufactured/modular……02
Mobile home…….03
Row house…….04
Two or Three family attached residence……05
Apartment with 4+ families……06
Condominium…….07
Other……08
Don't Know ……98
Refused ……...99

Specify Other: _____

48. Do you own or rent this residence?

Own …… 01
Rent ..…… .02
Don't Know ……..98
Refused …….99

49. *Approximately when was your home built?* [DO NOT READ RESPONSE OPTIONS]

Before 1960……01
1960-1969……..02
1970-1979……..03
1980-1989……..04
1990-1999……..05
2000-2005……..06
2006 or Later……..07
Don't know…….98
Refused……...99

50. How many square feet is the above-ground living space?

Square Feet: _____
Don't know…….98
Refused……...99

ASK Q26 IF Q25 = DON'T KNOW OR REFUSED

51. Would you estimate the above-ground living space is about:

Less than 1,000 square feet……..01
1000-2000 square feet……..02
2000-3000 square feet……..03
3000-4000 square feet……..04
4000-5000 square feet……..05
Greater than 5000 square feet……..06
Don't know……..98
Refused…….99

52. How many square feet of below-ground living space is heated or air conditioned?

Square Feet: _____
Does not apply……88
Don't know…….98
Refused……...99

ASK 28 IF Q27 = DON'T KNOW OR REFUSED

53. Would you estimate the below-ground living space is about:

Less than 1,000 square feet……..01
1000-2000 square feet……..02
2000-3000 square feet……..03
3000-4000 square feet……..04
4000-5000 square feet……..05
Greater than 5000 square feet……..06
Don't know……..98
Refused…….99

That's all the questions I have. Thank you for your time. Good bye.

Ohio Edison, The Illuminating Company and Toledo Edison

2012 Home Energy Audit Program

Online Audit Participant Survey: Cohort 1 or 2

Customer Name: _____ Phone Number: _____/_____/_____

Customer Account Number: _____ Customer Zip Code: _____

Date of Interview: _____/_____/_____

EDC:

Ohio Edison …… 01

Illuminating Company …… 02

Toledo Edison …….. 03

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 with the (NAME OF EDC) online Home Energy Analyzer. Is now a good time to talk with you about your experience with the Home Energy Analyzer? This will only take about 10 minutes.

Yes ……01	PROCEED WITH INTERVIEW
No …….... 02	THANK RESPONDENT AND TERMINATE
Refused …… 98	THANK RESPONDENT AND TERMINATE
Don't Recall.....99	THANK RESPONDENT AND TERMINATE

1. *First, could you tell me how you heard about the Home Energy Analyzer?* [DO NOT READ; INDICATE ALL THAT APPLY]

Bill Insert	01
Energy Save Ohio website	02
FirstEnergy Utility website	03
Print/Newspaper Ad	04
Radio	05
Word-of-Mouth	06
Other (specify)	07

Specify Other: _____

15. *Our records indicate that you used the Home Energy Analyzer on _____ (month/date) 2010 or 2011. Can you tell me why you decided to do an online home energy audit? What were your concerns?*

RECORD VERBATIM THEN CODE RESPONSE:

_____
_____
_____
_____
_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Investigate……..……...1
Financial (high bills)…….2
Conserve Energy…….…..3
Other……..……...4
Don't know/don't recall……..……..98
Refused ……99

16. *Can you tell me what you did online with the Home Energy Analyzer? Did you …*

ASK A-E

		Yes	No	DK	Refused
s.	Review changes in your bill/usage over time?	1	2	98	99
t.	Answer questions about your home appliances?	1	2	98	99
u.	Answer questions about weatherizing your home?	1	2	98	99
v.	Get detailed energy saving ideas for your home?	1	2	98	99
w.	Do something else?	1	2	98	99
x.	Don't recall	1			

Specify *"something else"*:

_____

17. *If you did not complete the entire online audit, what made you stop at the location you did?*

		Yes	No	DK	Refused
a.	Completed the entire survey?	1	2	98	99
b.	Was satisfied with the results?	1	2	98	99
c.	Ran out of time?	1	2	98	99
d.	Further improvements out of budget?	1	2	98	99

ASK Q4 IF DETAILED ENERGY SAVING IDEAS RECEIVED

18. What kind of detailed energy saving ideas did you receive? Did they involved:

		Yes	No	DK	Refused
a.	No-cost/low cost ways to save energy immediately?	1	2	98	99

b. Ways to save requiring investment but will pay off?	1	2	98	99
c. Ways to save that would not be cost-justified?	1	2	98	99
d. Other ways to save?	1	2	98	99

Specify Other THEN CODE RESPONSE:

_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Adjust Thermostat……..1
Turn off or unplug devices other than lights……..2
Turn off lights…….3
Installed energy-efficient lighting……...4
Implemented energy-efficient equipment or measures (other than lighting; or undefined measures)……5
No specific ……..6

6. *How helpful was the information provided by the Home Energy Analyzer? Would you say it was "Very Helpful, Somewhat Helpful, Neither Helpful nor Unhelpful, Somewhat Unhelpful, or Not at all Helpful"?*

Very Helpful ……...01
Somewhat Helpful …….....02
Neither Helpful nor Unhelpful…….03
Somewhat Unhelpful ……..04
Not at all Helpful …….....05
Don't Know/don't recall……98
Refused ……..…99

ASK Q6 IF Q5 = SOMEWHAT UNHELPFUL OR NOT HELPFUL

7. *What aspects were not helpful? Why?*

RECORD VERBATIM THEN CODE RESPONSE:

_____

_____

_____

_____

_____

[DO NOT READ; INDICATE ALL THAT APPLY]

It did not provide me new or actionable information……1
Did not understand it……..2
Don't know……...98
Refused ……99

8. *What aspect of the Home Energy Analyzer was most helpful to you? Why?*

RECORD VERBATIM THEN CODE RESPONSE:

_____
_____
_____
_____
_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Actionable ideas……1
Education……..……..2
Changed thermostat……..……..3
Other ……..……4
Don't know……...98
Refused ……99

22. What energy saving actions were you able to take, if any, as a result of using the Home Energy Analyzer?

RECORD VERBATIM THEN CODE RESPONSE:

_____
_____
_____
_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Structural changes taken……. 01
- Appliance…….a
- HVAC……..b
- General response……..c
- Lighting……...d
- Water heating measures……..e
- Shell measures……f

Behavioral changes taken…….. 02
- Appliance…….a
- HVAC……..b
- General response……..c
- Lighting……d
- Water heating measures……e
- Shell measures……..f

Both structural and behavioral changes taken…… ……03
No changes made yet……04
Don't Know/don't recall ……..……98
Refused ……99

ASK Q9 IF STRUCTURAL CHANGES WERE MADE

10. *How is that working out? Is the ___ (equipment/materials) that you purchased still installed?*

Yes, it's still installed……01
No, I removed it/took it out……..……..02
Don't Know……. ……..…….98
Refused ……..……99

ASK Q10 IF Q9= YES

11. *How satisfied are you with your new ____ (equipment/materials)? Would you say you are "Very Satisfied, Somewhat Satisfied, Neither Satisfied nor Dissatisfied, Somewhat Dissatisfied, or Very Dissatisfied"?*

Very satisfied ……..01
Somewhat satisfied ……02
Neither satisfied nor dissatisfied ……..03
Somewhat dissatisfied ……04
Very dissatisfied ……..……..…05
Don't know ……..……..98
Refused ……..…99

*ASK Q11- Q15 IF **BEHAVIORAL** CHANGES MADE; OTHERWISE SKIP TO Q16*

12. *Do you do things differently now to save energy in **hot weathe**r?*

Yes ……..01
No…… ……02
Don't know ……..98
Refused ……..….….99

13. *(IF YES) What do you do differently now?*

*RECORD VERBATIM THEN CODE RESPONSE*_____
_____
_____
_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Appliances…….…….1
HVAC…….....2
Lighting……..……3
General response…….……...4
Water heating measures…….5
Shell measures……..…….6

14. *Do you do things differently now to save energy in **cold weather**?*

Yes ……..……..01
No…… ……02
Don't know ……..98
Refused ……..…..….99

15. *(IF YES) What do you do differently now?*
*RECORD VERBATIM THEN CODE RESPONSE*_____
_____
_____
_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Appliances…….…….1
HVAC…….....2
Lighting……..……3
General response…….……...4
Water heating measures…….5
Shell measures……..…….6

16. *Are you continuing to do the changes you identified (the behavior changes identified in Q8, Q12 or Q14)?*

Yes, behavior still practiced……01
No, I stopped doing that…...……..……...…..02
Don't Know……. ……..…….98
Refused ……..……99

ASK Q16 IF <u>ANY CHANGES</u> WERE MADE; OTHERWISE SKIP TO Q18

17. *Have you noticed any savings on your electric bill since you made these changes?*

Yes, my electric bill has decreased ……..01
No, there does not seem to be a change in my electric bill …….02
Not sure or too soon to tell ……..……03
Don't know ……..98
Refused ……..…..….99

ASK Q17 IF Q16 = YES

18. *How satisfied are you with the savings you noticed on your electric bill since making these changes? Would you say you are "Very Satisfied, Somewhat Satisfied, Neither Satisfied nor Dissatisfied, Somewhat Dissatisfied, or Very Dissatisfied"?*

Very satisfied ……..01
Somewhat satisfied ……02
Neither satisfied nor dissatisfied ……..03
Somewhat dissatisfied ……04
Very dissatisfied ……..…05
Don't know ……..98
Refused ……..…99

29. *Overall, how satisfied are you with the (NAME OF EDC) Home Energy Audit Program? Would you say you are "Very Satisfied, Somewhat Satisfied, Neither Satisfied nor Dissatisfied, Somewhat Dissatisfied, or Very Dissatisfied"?*

Very satisfied ……..01
Somewhat satisfied ……02
Neither satisfied nor dissatisfied ……..03
Somewhat dissatisfied ……04
Very dissatisfied ……..…05
Don't Know ……98
Refused ……99

30. *Why do you give it that rating?*

RECORD VERBATIM THEN CODE RESPONSE:

_____

_____

_____

[DO NOT READ; INDICATE ALL THAT APPLY]

Financial satisfaction……1
HVAC……...2
Lighting……....3
Generally satisfied……..……..4
Neutral or indefinite response……..……....5
Not satisfied……..……6

31. *Do you have any suggestions to improve the (NAME OF EDC) Home Energy Analyzer?*

Yes …….. 01
No..…… 02
Don't Know ……98
Refused ……99

32. IF YES, RECORD VERBATIM THEN CODE RESPONSE:

_____

_____

_____

_____

[DO NOT READ; INDICATE ALL THAT APPLY]

More info is needed……..…..1
Better tracking system…….2
Audit request……..…….3
General response……..4
Rebates should be offered……...5
More advertising or better communication is needed……..……...6

I'd like to finish up by asking you some questions about your home.

33. *Which of the following best describes your home? (READ LIST: OPTIONS 01-07)*

Single-family home, detached construction……..01
Single-family home, factory manufactured/modular……02
Mobile home…….03
Row house…….04
Two or Three family attached residence……05
Apartment with 4+ families……06
Condominium…….07
Other……08
Don't Know ……98
Refused ……...99

Specify Other: _____

34. *Do you own or rent this residence?*

Own …… 01
Rent ..…….. .02
Don't Know ……..98
Refused …….99

35. *Approximately when was your home built?* [DO NOT READ RESPONSE OPTIONS]

Before 1960……01
1960-1969……..02
1970-1979……..03
1980-1989……..04
1990-1999……..05
2000-2005……..06
2006 or Later……..07

Don't know……98
Refused……...99

36. *How many square feet is the above-ground living space?*

Square Feet: _____
Don't know……98
Refused……...99

ASK Q26 IF Q25 = DON'T KNOW OR REFUSED
37. *Would you estimate the above-ground living space is about:*

Less than 1,000 square feet……..01
1000-2000 square feet……..02
2000-3000 square feet……..03
3000-4000 square feet……..04
4000-5000 square feet……..05
Greater than 5000 square feet……..06
Don't know……..98
Refused……99

38. *How many square feet of below-ground living space is heated or air conditioned?*

Square Feet: _____
Does not apply……88
Don't know……98
Refused……...99

ASK Q28 IF Q27 = DON'T KNOW OR REFUSED
39. *Would you estimate the below-ground living space is about:*

Less than 1,000 square feet……..01
1000-2000 square feet……..02
2000-3000 square feet……..03
3000-4000 square feet……..04
4000-5000 square feet……..05
Greater than 5000 square feet……..06
Don't know……..98
Refused……99

That's all the questions I have. Thank you for your time. Good bye.