

Energy Efficient Products Program Evaluation, Measurement and Verification Report 2017

Prepared for FirstEnergy Ohio Companies:

*Ohio Edison Company
Cleveland Electric Illuminating Company
Toledo Edison Company*

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Table of Contents

1. Executive Summary	1-1
2. Introduction and Purpose of Study	2-1
3. Impact Evaluation Objectives	3-1
4. Process Evaluation Objectives	4-1
5. Appliances	5-1
6. Consumer Electronics	6-1
7. Lighting	7-1
8. Conclusions and Recommendations	7-14
9. Appendix A: Required Savings Tables	9-1
10. Appendix B: Survey Instruments	10-1

List of Tables

Table 1-1: Program Rebates by Measure and Utility	1-2
Table 1-2: Overall Evaluation Results	1-3
Table 2-1: Rebated Measures	2-2
Table 2-2: Program Year 2017 Program Expected Energy Savings	Error! Bookmark not defined.
Table 4-1. Energy Efficient Program Research Questions	4-1
Table 5-1: Appliances Rebates by EDC and Measure	5-1
Table 5-2: Ex Ante Appliances kWh Savings by EDC and Measure	5-2
Table 5-3: Ex Ante Appliances kW Savings by EDC and Measure	5-2
Table 5-4: Deemed Savings Values for Energy Star® Refrigerators.....	5-4
Table 5-5: Deemed Savings Values for Energy Star® Freezers	5-5
Table 5-6: Deemed Savings Values for Energy Star® Clothes Washers	5-5
Table 5-7: Deemed Savings Values for Energy Star® Dehumidifiers	5-7
Table 5-8: Appliances Ex Post Energy (kWh) Savings by EDC	5-8
Table 5-9: Appliances Ex Post Peak Load Demand (kW) Savings by EDC	5-8
Table 5-10: Appliances Ex Post Totals.....	5-8
Table 5-11: Appliances Ex Post (kWh) Realization Rates	Error! Bookmark not defined.
Table 5-12: Appliances Ex Post (kW) Realization Rates.	Error! Bookmark not defined.
Table 5-13. Appliance Program Participation among Survey Respondents Who Received Rebates in 2017 (n=210).....	5-11
Table 5-14. Number of Customers Who Purchased Appliance Measures (n=3,600) .	5-14
Table 6-1: Consumer Electronics Rebates by EDC and Measure	6-1
Table 6-2: Ex Ante Consumer Electronics kWh Savings by EDC and Measure.....	6-1
Table 6-3: Ex Ante Consumer Electronics kW Savings by EDC and Measure.....	6-2

Table 6-4: kWh & kW Values for Office Equipment.....	Error! Bookmark not defined.
Table 6-5: kWh & kW Values for Televisions	Error! Bookmark not defined.
Table 6-6: Consumer Electronics Ex Post Energy (kWh) Savings by Type of Measure. 6-7	
Table 6-7: Consumer Electronics Ex Post Peak Load Demand (kW) Savings by Type of Measure	6-7
Table 6-8: Consumer Electronics Ex Post Totals	6-7
Table 6-9: Consumer Electronics Ex Post (kWh) Realization Rates	Error! Bookmark not defined.
Table 6-10: Consumer Electronics Ex Post (kW) Realization Rates	Error! Bookmark not defined.
Table 6-11. Number of Customers Who Purchased Consumer Electronics Measures (n=3,600).....	6-9
Table 7-1: Ex ante Lighting Rebates by EDC and Measure	7-1
Table 7-2: Ex Ante Lighting kWh Savings by EDC and Measure	7-1
Table 7-3: Ex Ante Lighting kW Savings by EDC and Measure	7-2
Table 7-4: Lighting Ex Post Energy (kWh) Savings by Type of Measure	7-6
Table 7-5: Lighting Ex Post Peak Load Demand (kW) Savings by Type of Measure...	7-6
Table 7-6: Lighting Ex Post Totals	7-6
Table 7-7: Lighting Ex Post (kWh) Realization Rates.....	Error! Bookmark not defined.
Table 7-8: Lighting Ex Post (kW) Realization Rates.....	Error! Bookmark not defined.
Table 7-9. Retail Store Participation and Lighting Variety	7-6
Table 7-10. Bulb Type Purchases	7-10
Table 8-1: Qualifying Products Rebated in Each Service Territory	8-1
Table 8-2: Overall Gross kWh and kW Savings per EDC.....	8-2
Table 8-3: Overall Gross kWh and kW Savings by Subprogram	8-2
Table 9-1: Annual Ex Post Energy Savings (kWh)	9-1

Table 9-2: Annual Ex Post On-Peak Demand Reductions (kW).....	9-2
Table 9-3: Lifetime Ex Post Energy Savings (kWh).....	9-3

1. Executive Summary

In 2017, FirstEnergy's Ohio Utilities, The Cleveland Electric Illuminating Company (CEI), Ohio Edison Company (OE) and The Toledo Edison Company (TE) (collectively "Companies") offered the Energy Efficient Products Program (EEP). This program offered residential customers rebates for the purchase of energy-efficient appliances. In addition, midstream methods were utilized to reduce the cost of energy efficient products in the lighting, and consumer electronics portion of the program. The goal of the program is to have the Companies' customers purchase more energy efficient products when they have the option to do so. During the 2017 program year, Consumer Electronics, Lighting, and Appliances were offered in the program. The program was administered by Honeywell as the Conservation Service Partner (CSP), which worked with manufacturers, distributors, and retailers to implement the program.

The Companies contracted, ADM Associates, Inc. (ADM) to perform the evaluation, measurement and verification (EM&V) activities described in this report. The procedures used to perform the EM&V activities described in this report were informed by the State of Ohio Energy Efficiency Technical Reference Manual (Ohio TRM¹) and the State of Pennsylvania Energy Efficiency Technical Reference Manual (PA TRM²).

This report describes the methodologies, procedures, data tracking systems utilized to conduct program evaluation activities, analysis methods and results. The three sub-program descriptions, the methodology of evaluations, methodology, and detailed evaluation findings will be summarized in the following chapters contained in this report.

A total of 108,049 rebates were issued in the service territories of the Companies through the Energy Efficient Products program in 2017. The number of rebates by measure type and utility are detailed in Table 1-1.³

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

² Pennsylvania Public Utility Commission, Technical Reference Manual 2016.

³ Number of rebates may not be equivalent to number of measures rebated in the program.

Table 1-1: Program Rebates by Measure and Utility

Measure Type	CEI	OE	TE	All Companies
Clothes Washer	804	1,124	303	2,231
Clothes Dryer	299	458	136	893
Refrigerators	579	777	182	1,538
Dehumidifiers	3,962	6,450	814	11,226
Freezers	227	717	85	1,029
Heat Pump Water Heaters	-	14	4	18
LED Fixtures	368	850	140	1,358
LED Bulbs	26,630	46,148	10,447	83,225
LED Appliance Turn In	14,660	23,032	5,976	43,668
Televisions	2,102	2,187	656	4,945
Computer	291	242	75	608
Computer Monitor	70	68	13	151
Imaging	362	378	87	827
Total	50,354	82,445	18,918	151,717

Ex post electric savings were calculated through detailed analysis of program tracking data and participant survey data. For all measure types listed in the Ohio TRM; all installation rates, deemed savings, and hours of use were calculated per the Ohio TRM (“Deemed”). In addition, ADM calculated gross savings for measures in the program with “as found” baseline conditions, hours of use, and installation rates. As specified in Ohio R.C. §4928.662, the values reported for energy savings (kWh) and peak demand reduction (kW) represent the higher calculated value obtained from both methodologies, for both *ex ante* and *ex post* energy savings.

Annual *Ex post* verified electric savings were 68,114,375 kWh (a realization rate of 88 percent). *Ex post* verified peak demand reduction was 8,400.76 kW. Variation in between *ex ante* and *ex post* results can primarily be attributed to the lower in service rates (ISRs) for LED bulbs and fixtures identified in a random digit dialing survey. Detailed tables listing energy savings and demand reductions by measure type can be found in Appendix A. *Ex post* gross energy savings (kWh) and peak demand reduction (kW) for the program in the three service territories are compared to *ex ante* estimates in Table 1-2.

Table 1-2: Overall Evaluation Results⁴

Utility	Ex Ante Expected Gross Savings		Ex Post Verified Gross Savings		Realization Rate	
	Gross kWh	Gross kW	Gross kWh	Gross kW	kWh	kW
CEI	29,353,361	3,614.71	25,787,141	3,171.09	88%	88%
OE	37,712,531	4,691.23	33,114,301	4,110.36	88%	88%
TE	10,556,234	1,284.04	9,212,932	1,119.31	87%	87%
All Companies	77,622,126	9,589.97	68,114,375	8,400.76	88%	88%

A comprehensive process evaluation was performed during the 2017 program year and the key findings can be found in the following subsections.

1.1 Program Operations Conclusions

The following section summarizes the conclusions related to program operations, signage, and performance.

- Honeywell is responsible for implementing the Energy Efficient Products Program, including recruiting retail partners to participate in the retail network; providing signage and sales associate training to retail partners; and processing customer rebates for downstream measures.
- The retailer network is a critical outreach strategy for the program; most customer outreach is done directly by retailers who participate in the network.
- Signage is critical for program operations but does not replace the interactions with retailers.

1.2 Retailer Feedback Conclusions

The following section summarizes the key findings from the retailer interviews.

- Overall, retailers are very satisfied with the program and report numerous benefits to participating in the retailer network.

⁴ All savings in this report are calculated at the retail level and do not include line losses.

- Retailers report that they primarily receive information about the program when staff visits their retail stores. More than half of retailers are satisfied with this level of communication.
- Retailers are often unsure or unaware of which equipment qualifies for the program and expressed interest in receiving additional training opportunities and program communications regarding qualifying products.

Customer Research Conclusions

The following section provides key findings based on the customer research.

- Most customers learn about the program from their retailer or utility mailing, indicating that the primary sources of information used in the program are effective in increasing customer awareness.
- Downstream incentive recipients surveyed voiced exceptionally high satisfaction with the program with 92% saying they are satisfied with the program overall.
- Most customers surveyed as part of the general population survey that reported purchasing a refrigerator, freezer, or dehumidifier in the prior year said that purchase was ENERGY STAR®-qualified (85%, 78%, and 77%, respectively).
- Based upon their review of program signage, approximately half of mobile survey respondents report that they are likely to purchase a more efficient option the next time they are shopping for an appliance, consumer electronic, or lighting product.

1.3 Recommendations

The evaluation team offers the following recommendations for continued improvement of the Residential Energy Efficient Products Program.

- The Companies could consider identifying additional opportunities to train and educate retail staff. The Companies and their implementation contractor could work with the individual retail stores to identify the optimal way to provide information to educate retail staff on qualifying products and the Companies' rebates and incentives. Additionally, per interviews, there would be value for Honeywell or the Companies' staff to visit retailers more frequently and offer ad-hoc or refresher training and information to retail staff, in addition to formal training opportunities.
- The Companies could consider identifying opportunities to enhance communications with retail stores and retail sales associates. Communications from the program must make their way to sales associates who are on the floor selling products.

- The Companies could consider identifying additional ways to engage smaller, independent retailers who want to participate, but were frustrated by not knowing about the program earlier. The Companies could consider offering retailer program information on the program website. This information could include retailer participation requirements and instructions for program enrollment.
- The program could identify strategies to improve customer awareness of utility sponsorship if this is a high priority for the program. Messaging could focus on the Companies' role in sponsoring the discounts, instead of simply including the Companies' logo.

2. Introduction and Purpose of Study

Under contract with the FirstEnergy's Ohio Utilities, The Cleveland Electric Illuminating Company (CEI), Ohio Edison Company (OE), and The Toledo Edison Company (TE) (collectively "Companies"), ADM Associates, Inc. (ADM) has performed evaluation, measurement, and verification (EM&V) activities to confirm the energy savings (kWh) and demand reduction (kW) achieved through the energy efficiency programs that the Company is implementing in Ohio in 2017. The purpose of this report is to present the results of the impact evaluation effort undertaken by ADM to verify the energy savings and peak demand reductions that resulted from the program, as further described in Section 3, through the Energy Efficient Products Program during 2017. Additionally, this report presents the results of the process evaluation of the program completed by ADM and ILLUME focusing on participant and program staff perspectives regarding the program's implementation.

2.1 Description of the Program

The Program provided rebates to residential customers as well as financial incentives and support to retailers that sell energy efficient products such as ENERGY STAR® qualified appliances. The rebates were designed to encourage the purchase and installation of energy-efficient appliances, lighting, and electronics that would reduce electricity consumption and reduce summer peak load demand. The rebates were distributed through three main program channels, described below.

- **Upstream channel:** – incentives were paid/directed at the manufacturer level and pass along a "reduced price" product reflected in point-of-sale purchases.
- **Midstream channel:** incentives were paid/directed to the retailer level, with impacts passed along to the downstream self-install customer.
- **Downstream channel:** incentives were paid to the utility customer.

Measures rebated in 2017 include:

Table 2-1: Rebated Measures

Measure	Distribution Channel
Clothes Washer	Downstream
Clothes Dryer	Downstream
Refrigerators	Downstream
Dehumidifiers	Midstream
Freezers	Midstream
Heat Pump Water Heaters	Midstream
LEDs	Upstream
LED Fixtures	Upstream
Televisions	Midstream
Computer	Midstream
Computer Monitor	Midstream
Imaging	Midstream

The Company contracted with Honeywell to manage the Program as the Conservation Service Partner (CSP). ADM reviewed Honeywell's rebate processes including participant documentation, procedures for calculating energy savings, and the tracking and reporting system used to report energy savings.

3. Impact Evaluation Objectives

The impact evaluation component of this report estimates annual gross energy savings (kWh) and peak demand reduction (kW) as framed by the following five research questions:

- How many customers participated in the program?
- How many and which measure types were installed through the program?
- What percentage of each measure type can be verified as installed?
- What are the kWh savings achieved by the program?
- What was the kW reduction achieved by the program?

The primary deemed savings and/or engineering algorithm source for determining program impacts was the Ohio TRM. The Pennsylvania TRM version 5 (“PA TRM”) was used as a secondary calculation source for all measures not listed in the Ohio TRM.

Per Ohio RC §4928.662, for all measure types listed in the Ohio TRM; all installation rates, deemed savings, and hours of use were calculated per the Ohio TRM (“Deemed”). In addition, ADM calculated gross savings for measures in the program with “as found” baseline conditions, hours of use, and installation rates. The values reported for both ex ante and ex post energy savings (kWh) and peak demand reduction (kW) represent the higher calculated value obtained from both methodologies.

The specific methodologies used to evaluate each sub-program is described in detail in chapters 5, 6, and 7.

3.1 Percent of Savings from Income Qualified Customers

Questions were added to the evaluation and CAP RDD surveys to assess low income participation in this subprogram. The surveys were administered so that the customer disclosed their annual income range from a series of categories. Customers also reported the number of occupants in the household. This information was used to support the determination of whether the household is above or below 150% of Federal Poverty Level (FPL). Respondents were low income qualified if the stated incomes were below 150% of FPL (**Error! Reference source not found.**).

Table 3-1: 2017 Federal poverty levels and 150% of poverty levels.

Persons in Household	2017 Federal Poverty Level	150% Federal Poverty Level
1	\$12,060	\$18,090
2	\$16,240	\$24,360
3	\$20,420	\$30,630
4	\$24,600	\$36,900
5	\$28,780	\$43,170
6	\$32,960	\$49,440
7	\$37,140	\$55,710
8	\$41,320	\$61,980

The Participant survey results were sorted by the number of people reported in each household and the household income ranges that fall below the 150% Federal Poverty Level shown in **Error! Reference source not found.**. For each of these groupings of occupants and incomes, ADM further broke down the data by reported participants in each EDC by measure type. Once these counts of low income participants are calculated for each group in **Error! Reference source not found.**, they are summed up to get the number of low income participants in each EDC by measure type. Because the survey represents a statically valid sample for the program population we can use the percentages calculated from the numbers of low income participants relative to the number of participants in the entire survey, to assess the savings for low income participants in the program. To calculate the savings for the low income portion of the program participants, the ex post energy and demand savings are multiplied by the percentage of low income participants by EDC.

4. Process Evaluation Objectives

The overarching objective of the Residential Energy Efficient Program process evaluation is to capture and record program delivery and progress towards goals, document program successes, and inform implementation strategies for the future. Below provides a summary of the research questions and corresponding data collection activities.

Table 4-1. Energy Efficient Program Research Questions

Researchable Questions	Activity to Support the Question
Is the program being administered effectively in terms of program oversight, communication, staffing, training and/or reporting?	Program staff interviews Retailer interviews
Has the program and each sub-program performed as expected and, if not, why not?	Tracking system analysis Program staff interviews Retailer interviews
How is the program engaging retailers, and is the level of engagement sufficient to encourage customer purchase of program qualifying measures?	Program staff interviews Retailer interviews
How are program-provided services and materials (e.g., signage, training) received by retailers, and are there opportunities for improvement?	Staff interviews Materials review Retailer interviews
Were retailers and program participants satisfied with their experiences?	Participant survey Retailer interviews
How effective are the signage and retailer staff in communicating benefits and encouraging purchase of program qualifying equipment?	Participant surveys Mobile panel surveys
What is the awareness and level of need for program rebates?	Participant surveys General population surveys
What changes can be made to the program's design or delivery to improve its effectiveness in future program years?	Program staff interviews Retailer interviews Participant survey General population survey

To address these researchable issues, ILLUME conducted a host of primary and secondary activities from October 2017 to February 2018:

- **Materials and Marketing Analysis:** The evaluation team conducted a marketing and materials analysis to assess marketing and messaging employed by the program. This analysis included a review of key program documents, retailer marketing materials, and the Residential Energy Efficient Products Program website.
- **Telephone Interviews with Participating Retailers:** During November and December 2017, the evaluation team completed telephone interviews with 22 program-participating retailers. The goal of the interviews was to understand the retailer perspective on the Energy Efficient Products Program. Research areas included: program engagement; motivation to participate; effectiveness of in-store signage; perception of the impact of financial support on customer purchasing; and program value and overall satisfaction.
- **Mobile In-Store Customer Survey:** During January and February 2018, our team fielded a mobile in-store customer surveys targeting 50 respondents while they visited participating retailers. The goal of the mobile in-store customer survey was to understand the customer experience with the program.
- **Program Benchmarking:** Our team conducted a secondary literature review and program benchmarking to assess the overall market, and market trends in program design, delivery, and product offerings for measures similar to those offered in the Energy Efficient Products Program.
- **Upstream and Downstream Surveys:** ADM fielded upstream, midstream, and downstream participant surveys. ILLUME provided process-specific questions for inclusion in these surveys. The downstream survey targeted program participants, and the upstream survey targeted a general population of the Companies' residential customers, via a random digit dial telephone survey.

5. Appliances

The purpose of this chapter is to present the findings of the Appliance measures from the impact and process evaluation effort undertaken by ADM to verify the energy savings and peak demand reduction.

5.1 Description of Appliances Sub-program

The program provides rebates to residential customers as well as financial incentives and support to retailers that sell ENERGY STAR® qualified appliances. The rebates are designed to encourage the purchase and installation of energy-efficient appliances that will reduce electricity consumption and reduce summer peak load demands.

Energy efficient appliances that are rebated in 2017 through the downstream channel include:

- ENERGY STAR® Clothes Dryers
- ENERGY STAR® Clothes Washers
- ENERGY STAR® Refrigerators

Energy efficient appliances that are rebated in 2017 through the midstream channel include:

- ENERGY STAR® Water Heaters
- ENERGY STAR® Freezers
- ENERGY STAR® Dehumidifiers

Table 5-1 presents the appliances rebates by EDC and measure, Table 5-2 presents ex ante kWh savings by EDC and measure, and Table 5-3 present ex ante kW savings by EDC and measure.

Table 5-1: Appliances Rebates by EDC and Measure

Measure	CEI	OE	TE	Total
Clothes Washer	804	1,124	303	2,231
Clothes Dryer	299	458	136	893
Refrigerators	579	777	182	1,538
Dehumidifiers	3,962	6,450	814	11,226
Freezers	227	717	85	1,029
Water Heater (Heat Pump)	-	14	4	18
Totals	5,871	9,540	1,524	16,935

Table 5-2: Ex Ante Appliances kWh Savings by EDC and Measure

Measure	CEI	OE	TE	Total
Clothes Washer	162,408	227,048	61,206	450,662
Clothes Dryer	8,187	12,540	3,724	24,450
Refrigerators	69,235	93,172	21,547	183,954
Dehumidifiers	1,015,611	1,639,970	208,677	2,864,258
Freezers	29,964	94,644	11,220	135,828
Water Heater (Heat Pump)	0	23,632	6,752	30,384
Totals	1,285,405	2,091,006	313,126	3,689,536

Table 5-3: Ex Ante Appliances kW Savings by EDC and Measure

Measure	CEI	OE	TE	Total
Clothes Washer	18.57	25.96	7.00	51.54
Clothes Dryer	1.44	2.20	0.65	4.29
Refrigerators	7.91	10.64	2.46	21.01
Dehumidifiers	237.27	383.19	48.81	669.27
Freezers	4.54	14.34	1.70	20.58
Water Heater (Heat Pump)	0.00	3.23	0.92	4.16
Totals	269.73	439.57	61.55	770.84

5.2 Impact Evaluation Methodology

The following section details the methods used to calculate energy savings and demand reductions for the Appliances sub-program.

5.2.1 Sampling Plan

ADM completed a census review of all measures listed in the tracking system to ensure appropriate use of deemed savings values.

The sample size for the follow-up surveys in each service territory achieved a relative precision of $\pm 10\%$ at the 90% confidence interval. The sample size calculation for achieving 90% confidence with 10% precision is shown in the formula below.

Equation 1: Minimum Sample Size Formula for 90 percent Confidence

$$n_0 = \frac{N \times \frac{1}{4}}{(N - 1) \times \frac{D^2}{Z_{\alpha/2}^2}}$$

Where:

n_0 = Minimum sample size

N = Population size, assumed to be 100,000 or greater

Z $\alpha/2$ = Z value at 90% confidence interval, 1.645

$\frac{1}{4}$ = The maximum value of $p(1-p)$ at $p=1/2$, a conservative estimate for sample size

D = Relative Precision (0.10)

ADM has selected up to a sample size of 220 for allocating respondents across the various EDC this is to ensure 70 completed surveys per service territory.

5.2.2 Verification of Measures Rebated

Ex Ante Review

ADM conducted an *ex ante* review of the Program's final 2017 appliance database. In this review, ADM carried out the necessary data cleaning and data editing steps in preparing the data for analysis, including:

- Verification of rebate status as completed;
- Verification of measure rebate requirements (e.g., ENERGY STAR® qualified status) for completed rebate applications;
- Elimination of duplicate data entries;
- Elimination of cases with incomplete data (e.g., no model number provided); and
- Verification that all rebates paid for ENERGY STAR® qualified clothes washers are from homes with electric hot water heaters.⁵

Appliances verified as passing ADM's rebate screening process were analyzed further for energy and demand savings using the procedures described below. The final measure count per appliance category is the total number of appliances that pass all the applicable screens in qualifying as a rebated product for which savings is claimed by the 2017 Program.

Customer Surveys

Data collected via program participant surveys informed both the impact and process evaluations. The evaluation team administered participant surveys online and/or by telephone; the chosen method was dependent on the availability of contact information and progress toward achieving the required sample size. We designed survey

⁵ This check was carried out through a combination of procedures, including desk review of Honeywell documentation, and customer surveys.

instruments to collect useful and detailed information while minimizing respondent burden.

ADM also included questions to gather information on low-income participation within the EE Products program. This was done by obtaining a gross household income and the number of people living in each household to obtain the percentage of Federal Poverty Level (FPL) for each household.

For the Appliance sub-programs, the evaluation team administered participant surveys to a random sample of program participants across the three EDCs. Surveys addressed program awareness, the application process, their experiences with contractors, and satisfaction with the energy efficient appliance or equipment they purchased and the program overall.

5.2.3 Energy Savings and Peak Demand Reduction Calculations

Deemed savings values from the Ohio TRM were used to analyze the energy savings and demand reductions for:

- ENERGY STAR® Refrigerators
- ENERGY STAR® Freezers
- ENERGY STAR® Clothes Washers

The engineering algorithm from the Ohio TRM was used to analyze the energy savings and demand reductions for:

- ENERGY STAR® Clothes Dryers
- ENERGY STAR® Heat Pump Water Heaters
- ENERGY STAR® Dehumidifiers

Further, the detail of the calculations is provided below.

ENERGY STAR® Refrigerators

Annual energy savings and peak demand reduction are deemed based on the refrigerator door configuration, which is recorded in the Honeywell appliance database. Table 5-4 shows the deemed savings values for ENERGY STAR® qualified refrigerators specified in the TRM (p. 53) for the purchase of ENERGY STAR® Refrigerators.

Table 5-4: Deemed Savings Values for Energy Star® Refrigerators

Refrigerator Configuration	Average Annual kWh Savings per unit	Average Summer Coincident Peak kW Savings per unit
Bottom Freezer	119	0.021

Top Freezer	100	0.018
Side by Side	142	0.025

ADM checked the AEG database for any other refrigerator configurations that were rebated (e.g., single door refrigerators). ADM looked up the appropriate deemed savings values in the ENERGY STAR® refrigerator database for any other listed models that were rebated. ADM also checked for misclassification of rebated refrigerators. Any misclassified refrigerators identified were re-assigned to their proper refrigerator configuration categories and deemed savings values were based on these re-assigned classifications.

ENERGY STAR® Freezers

Annual energy savings and peak demand reduction are calculated based on freezer type which was determined based on the model numbers in the Honeywell appliance database. The 2008 federal standard baseline for max consumption is applicable base on language in RC §4928.662.

Table 5-5: Deemed Savings Values for Energy Star® Freezers

Freezer Type	Average of Annual Energy Use (kWh/yr)	Average of Adjusted Volume (ft3)	2008 Federal Standard for max kWh consumption	Average of Percent Less Energy Use than 2008 Federal Standard	kWh savings per unit
Chest Freezer	192	12	258.11	26%	67
Upright Freezer Automatic	451	26	647.49	30%	197
Upright Freezer Manual	229	5	293.87	22%	65

ENERGY STAR® Clothes Washers

ADM verified the rebated clothes washers and ENERGY STAR®. Deemed savings were applied as outlined in the table below.

Table 5-6: Deemed Savings Values for Energy Star® Clothes Washers

Measure	Hours	CF	Energy Savings (kWh)	Demand Reductions (kW)
Energy Star Clothes Washer	320	0.033	202	0.021

CEE TIER 3 Washer	320	0.033	233	0.024
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ENERGY STAR® Clothes Dryers

ADM verified the rebated clothes dryers and ENERGY STAR® qualification and ensured the moisture sensor feature on the dryers as stated on the Portfolio Plan for the rebate on dryers. The algorithm used to calculate the dryer annual kWh savings is derived from the PA TRM (p. 152).

Equation 2: Annual Energy Savings – Clothes Dryer w/moisture sensor

$$kWh\ Savings = Cycles_{wash} \times \% \frac{dry}{wash} \times Load_{avg} \times \left(\frac{1}{CEF_{base}} - \frac{1}{CEF_{ee}} \right)$$

Where:

- $Cycles_{wash}$ = Number of washing machine cycles per year = 250
- % dry/wash = Percentage of homes with a dryer that use the dryer every time clothes are washed
- $Load_{avg}$ = weight of average dryer load in pounds per load = 8.45(standard); 3.0 (compact dryer)
- CEF_{base} = Combined Energy Factor of baseline dryer, in lbs/kWh
- CEF_{ee} = Combined Energy Factor of Energy Star dryer, in lbs/kWh

Equation 3: Annual Demand Savings – Clothes Dryers w/moisture sensor

$$kW\ Savings = \frac{\left(\frac{1}{CEF_{base}} - \frac{1}{CEF_{ee}} \right) \times Load_{avg}}{Time_{cycle}} \times CF$$

Where:

- $Load_{avg}$ = weight of average dryer load in pounds per load = 8.45 (standard); 3.0 (compact dryer)
- CEF_{base} = Combined Energy Factor of baseline dryer, in lbs/kWh
- CEF_{ee} = Combined Energy Factor of Energy Star dryer, in lbs/kWh
- $Time_{cycle}$ = Duration of average drying cycle in hours = 1 Hour
- CF = Coincidence Factor = 0.042

ENERGY STAR® Heat Pump Water Heaters

ADM verified the rebated heat pump water heaters through the invoice review process and calculated the savings per the Ohio TRM algorithm listed below.

$$\Delta \text{kWh} = \text{KWh}_{\text{base}} * ((\text{COP}_{\text{new}} - \text{COP}_{\text{base}}) / \text{COP}_{\text{new}}) + \text{KWh}_{\text{cooling}} - \text{KWh}_{\text{heating}}$$

Where:

- **KWh_{base}** = Average electric DHW consumption = 3460
- **COP_{new}** = Coefficient of Performance of Heat Pump water heater = 2.0
- **COP_{base}** = Coefficient of Performance of standard electric water heater = 0.904
- **KWh_{cooling}** = savings from conversion of heat in home to water heat = 180
- **KWh_{heating}** = Heating cost from conversion of heat in home to water heat.

Dependent on heating fuel as follows:

- electric resistance = 1,577
- heat pump COP 2.0 = 779
- fossil fuel = 0

ENERGY STAR® Dehumidifiers

ADM verified the rebated dehumidifiers through the invoice review process and calculated the savings using the Ohio TRM deemed values in the table below.

Table 5-7: Deemed Savings Values for Energy Star® Dehumidifiers

Capacity	Energy Savings (kWh)	Demand Reductions (kW)
<25	130	0.01
>25 to 35	120	0.03
>35 to 45	149	0.05
>45 to 54	266	0.07
>54 to 75	249	0.04
>75 to 185	179	0.09

5.3 Impact Evaluation Findings

The *ex post* energy savings for the Appliances sub-program totaled 3,708,456 kWh and *ex post* peak load demand reduction totaled 716 kW. Ex ante estimates were highly accurate as the realization rates for this sub-program were 100% and 93% respectively.

Table 5-8, Table 5-9, and Table 5-9 below show Ex Post kWh and kW savings per measure across each EDC and the totals.

Table 5-8: Appliances Ex Post Energy (kWh) Savings by EDC

Measure	CEI	OE	TE	Total
Clothes Washer	169,042	236,131	64,120	469,293
Clothes Dryer	8,171	12,540	3,708	24,419
Refrigerators	68,990	93,009	21,358	183,357
Dehumidifiers	1,015,731	1,640,108	208,715	2,864,554
Freezers	30,099	95,071	11,271	136,442
Water Heater (Heat Pump)	0	23,638	6,754	30,392
Totals	1,292,033	2,100,498	315,925	3,708,456

Table 5-9: Appliances Ex Post Peak Load Demand (kW) Savings by EDC

Measure	CEI	OE	TE	Total
Clothes Washer	17.43	24.35	6.61	48.40
Clothes Dryer	1.44	2.22	0.66	4.32
Refrigerators	12.08	16.29	3.74	32.11
Dehumidifiers	213.60	345.93	43.53	603.07
Freezers	5.27	16.65	1.97	23.89
Water Heater (Heat Pump)	0.00	3.23	0.92	4.15
Totals	249.83	408.66	57.44	715.93

Table 5-10: Appliances Ex Post Totals

Measure	Ex Ante kWh	Ex Ante kW	Ex Post kWh	Ex Post kW	kWh RR	kW RR
Clothes Washer	450,662	51.54	469,293	48.40	104.1%	93.9%
Clothes Dryer	24,450	4.29	24,419	4.32	99.9%	100.7%
Refrigerators	183,954	21.01	183,357	32.11	99.7%	152.8%
Dehumidifiers	2,864,258	669.27	2,864,554	603.07	100.0%	90.1%
Freezers	135,828	20.58	136,442	23.89	100.5%	116.1%
Water Heater (Heat Pump)	30,384	4.16	30,392	4.15	100.0%	99.8%
Totals	3,689,536	770.84	3,708,456	715.93	100.5%	92.9%

5.4 Detailed Process Evaluation Findings

The Appliances sub-program provides customer rebates and midstream incentives. The type of incentive received depends on the measure.

- Downstream incentive measures: refrigerators (tier 1, tier 2, tier 3), clothes washers, clothes dryers, and solar water heaters.

- Midstream incentive measures: freezers, dehumidifiers, and heat pump water heaters.

Several retail stores participate in the Appliances sub-program. Program data shows that retail stores stocking measures with downstream customer rebates include ABC Warehouse, Appliance Center, Appliance Smart, Best Buy, Costco, Grove Appliance, Hartville Hardware, HH Gregg, Home Appliance, The Home Depot, JCPenney, Lowe's, Menard's, Sears, and Wooster Appliance.⁶

According to the Companies' Appliance Finder Tool on the program website, customers can choose from many eligible appliances across a variety of manufacturers.⁷

- Clothes dryers: 14 total manufacturers;
- Clothes washers: 24 total manufacturers; and
- Refrigerators: 116 total manufacturers.

In addition, anywhere from one to 59 different appliance models appear to be eligible from different manufacturers.

According to the program website, customers can purchase midstream-paid appliances at Best Buy, The Home Depot, and Sears. To find qualifying products, customers are directed to the ENERGY STAR® website.

Appliance Signage

Appliance signage messaging differs depending on whether the product has a downstream customer rebate or is a midstream incentive product. The evaluation team reviewed five different pieces of signage for downstream appliance measures and two pieces of signage for midstream appliance measures. All downstream and midstream appliance signage pieces contain the Companies' logo and ENERGY STAR® logo.

Downstream appliance signage that includes the appliance cling tag; appliance aisle violator; appliance wobblers; appliance easel back; and the appliance cube.⁸ As described by retailers during retailer interviews, appliance cling tags are tags that can be hung on qualifying appliances. The appliance cube is a 4-sided sign cube that can be placed on qualifying appliances or appliance service desks. The appliance aisle violator; appliance

⁶ The evaluation team cleaned the tracking database to calculate the types of participating retailers. However, due to how the tracking system captured store names, the list of total participating retailers may be slightly different than the number identified by the evaluation team.

⁷ The appliance finder tool contains manufacturer name variations and therefore the counts appear slightly higher than what they actually are.

⁸ These are the names for different appliance signage pieces developed by Honeywell and sent to the evaluation team for review.

wobbler; and appliance easel back are all larger, 1-2-page pieces of signage that can be placed in aisles and near qualifying appliances.

All five pieces of downstream appliance signage focus messaging on rebates that customers can earn for purchasing ENERGY STAR® appliances:

- \$50 rebate for clothes dryers;
- \$50 rebate for clothes washers;
- Up to \$75 rebate for refrigerators; and
- \$375 rebate for solar water heaters.

In addition to advertising rebate amounts, the appliance cube signage contains information regarding how much money customers can expect to save by purchasing an ENERGY STAR® appliance. For example, the appliance cube signage notes that “an ENERGY STAR® certified refrigerator can save you more than \$270 over the next 5 years.”

All signage pieces, except for the appliance cube sign, direct customers to find qualifying appliances by either texting “saving” to 55678 or visiting energysaveOhio.com (the program website, which includes the Appliance Finder Tool).

Midstream appliance signage includes the midstream appliances cling tag and midstream appliances wobbler.

Messaging focuses on encouraging customers to purchase qualifying heat pump water heaters, freezers, and dehumidifiers to save energy and money. For example, the midstream appliance wobbler tells customers that dehumidifiers “*use nearly 30% less energy*”, freezers are “*10% more energy efficient*” and heat pump water heaters have an “*average savings of \$330 per year.*” The midstream appliance cling tag does not contain messaging related to specific energy or money savings.

Appliance Customer Findings – Downstream Measures

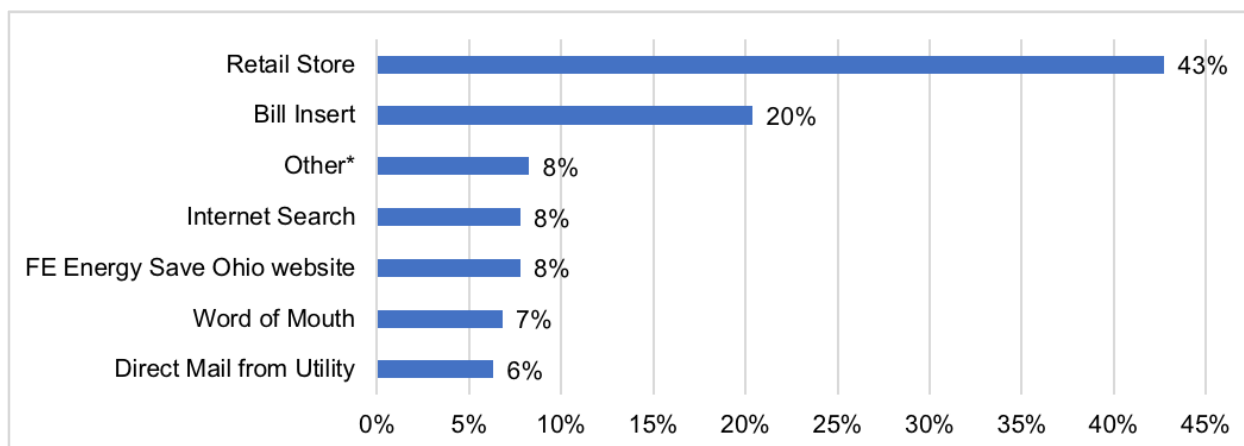
The evaluation team conducted a telephone survey of 210 customers who received rebates for the downstream incentives. As noted in the table, a portion of customers received rebates for more than one measure (not surprisingly, most frequently clothes washers and dryers); therefore, the total exceeds 100%.

Table 5-11. Appliance Program Participation among Survey Respondents Who Received Rebates in 2017 (n=210)

Measure	% Survey Respondents Who Received Rebate ⁹	# Survey Respondents Who Received Rebate
Clothes washers	55%	135
Refrigerators	64%	116
Clothes dryers	43%	90
Total measures purchased	N/A	341

Customers are primarily learning about the rebates when at the retailer or through the Companies' communications. Among survey respondents who had received an appliance rebate during 2017, nearly half reported that they learned about program rebates while at a retail store (43%) and a fifth through bill inserts.

Figure 5-1. Source of Customer Awareness of Appliance Program Rebates (n=206)



While in-store, the majority of customers report that they learned about program rebates from a store employee (70%) or through store signage (60%).

While energy efficiency is a benefit of program-qualifying equipment, appliance features and aesthetics primarily influenced customers' decisions. Features were a prevalent decision point for all appliances (25%-30% responding this was a motivation). The color

⁹ Percent does not total 100% since customers can receive rebates on multiple measures.

was also a high motivator for refrigerators. Price also factored in for about a fifth of customers.

Figure 5-2. Motivations for Buying ENERGYSTAR® Appliances

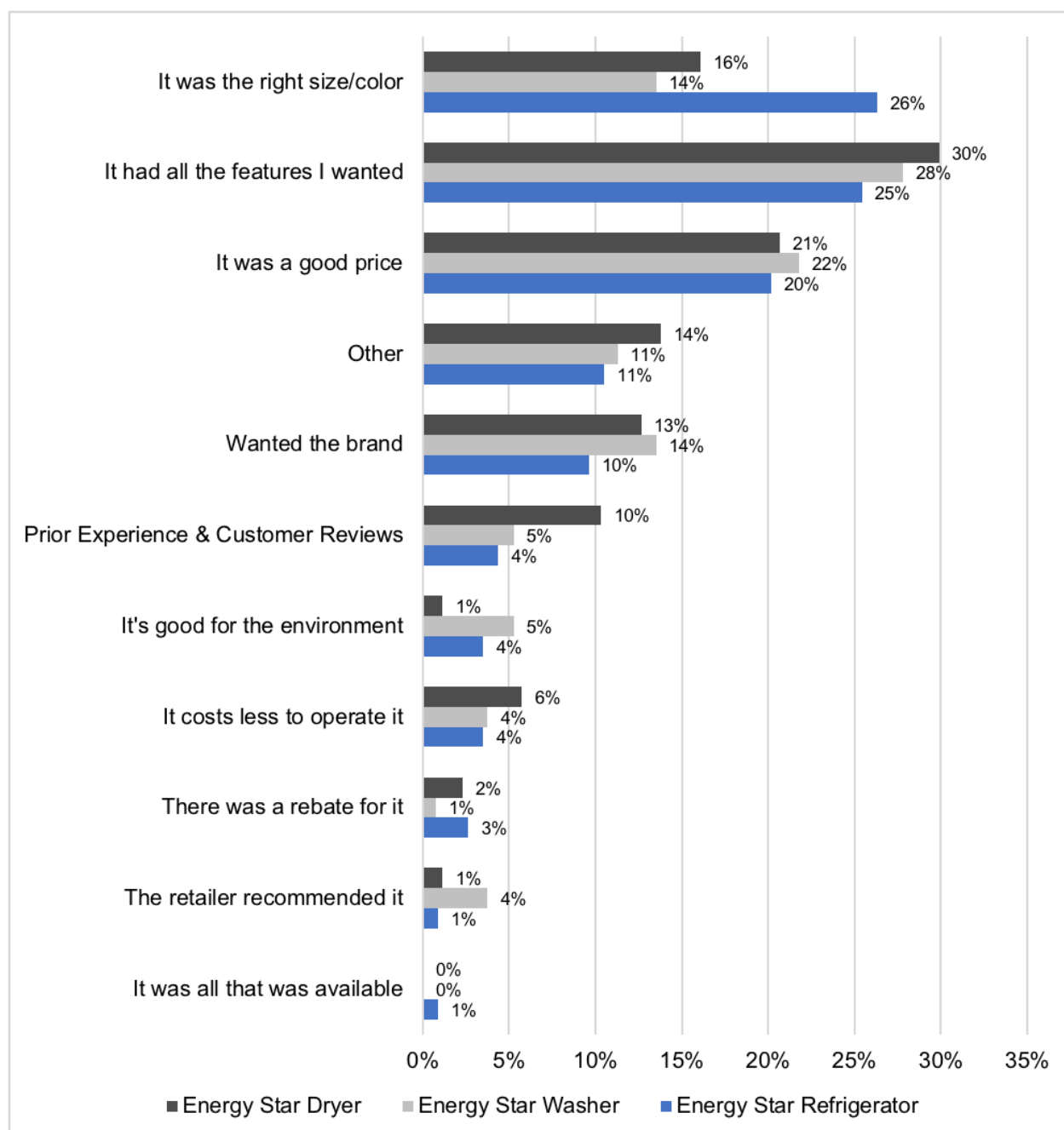


Figure Note: Denominator for figure by measure: n=123 for refrigerators; n=142 for clothes washers; n=99 for clothes dryers.

Nearly all customers are satisfied with their experience with the Energy Efficient Products Program. A majority said they are satisfied with the program overall and communications with program staff (92% and 90%). A similar percentage of customers are also satisfied with the amount of and time to receive the rebate.

Figure 5-3. Survey Respondent Satisfaction with Program and Communications (n=208)

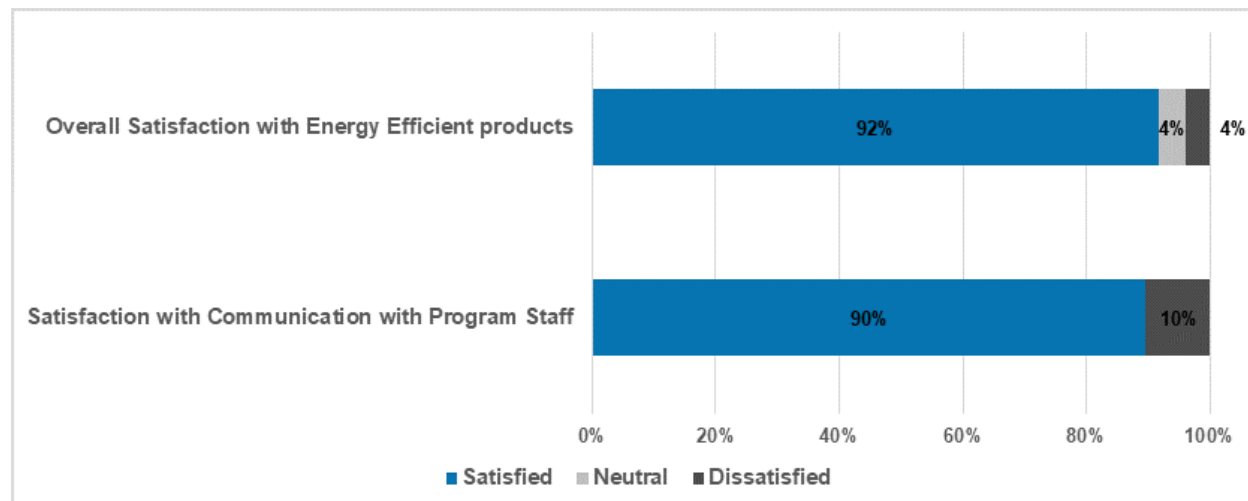


Figure Notes: (1) Denominator for overall satisfaction with Energy Efficient Products Program = 208. (2) Denominator for satisfaction with communication with program staff = 48, since 48 customers reported contacting the program.

Figure 5-4. Survey Respondent Satisfaction with Rebate

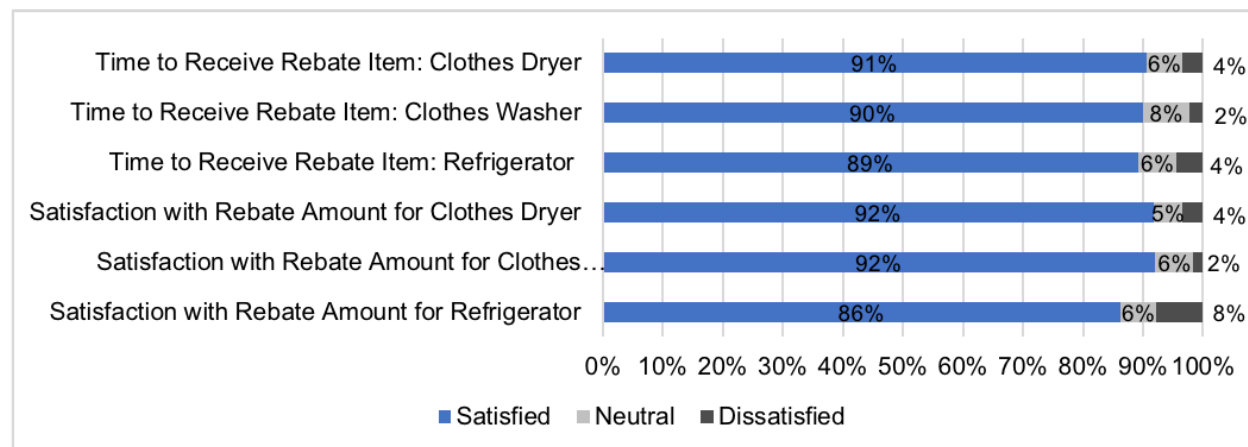


Figure Notes: (1) Denominator for satisfaction is the number of respondents who reported receiving a rebate for each measure; n=85 for clothes dryer; n=126 for clothes washer; n=116 for refrigerator).

Appliance Customer Findings – General Population Survey

The evaluation team conducted a general population survey of the Companies customers.¹⁰ The survey attempted to identify customers' purchasing patterns related to program qualifying equipment. Note that the survey only assessed three types of appliances: refrigerators, dehumidifiers, and freezers.¹¹

Refrigerators were the most commonly purchased measure among survey respondents, with 13% of survey respondents purchasing this appliance.

Table 5-12. Number of Customers Who Purchased Appliance Measures (n=3,600)

Measure	% Survey Respondents Who Purchased Measure
Refrigerators	13%
Dehumidifiers	7%
Freezers	5%

Most respondents (75%) report that their purchases are ENERGY STAR®-qualified products. Refrigerators were most likely to be ENERGY STAR® qualified (85%).

¹⁰ This was a random digit dial survey of the Companies customers.

¹¹ The survey also assessed lighting, HVAC measures, including room air conditioners; central air conditioners; heat pumps; and mini-split heat pumps.

Figure 5-5. Percent of Purchases that were ENERGY STAR®-Qualified

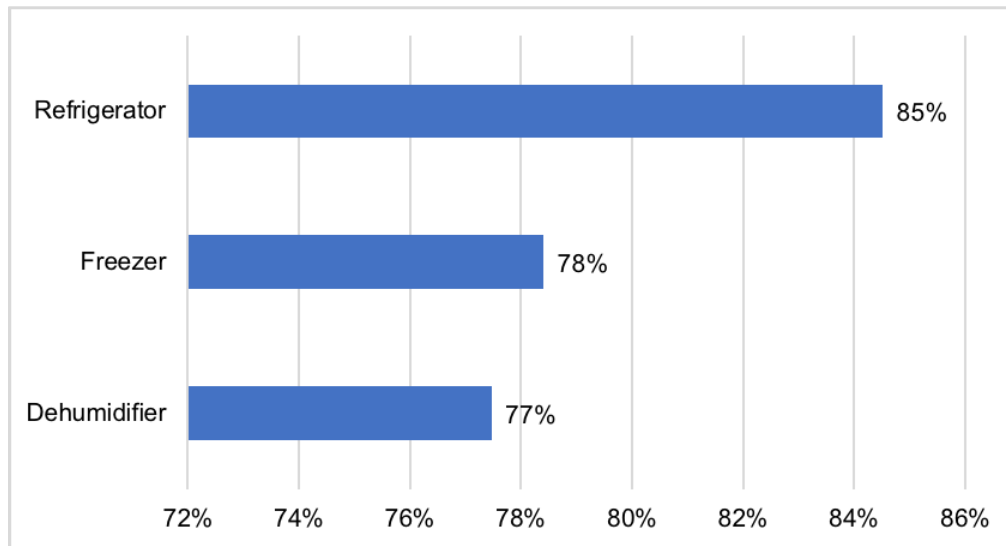


Figure Notes: Denominator includes customers who report purchasing the specific measure. Refrigerators: n=465; freezer: n=177; dehumidifier; n=253.

Survey respondents reported purchasing their refrigerators, freezers, and dehumidifiers at several retail stores that participate in the Energy Efficient Products Program (e.g., Lowe's, The Home Depot, etc.).

Figure 5-6. Where Survey Respondents Purchased Appliances

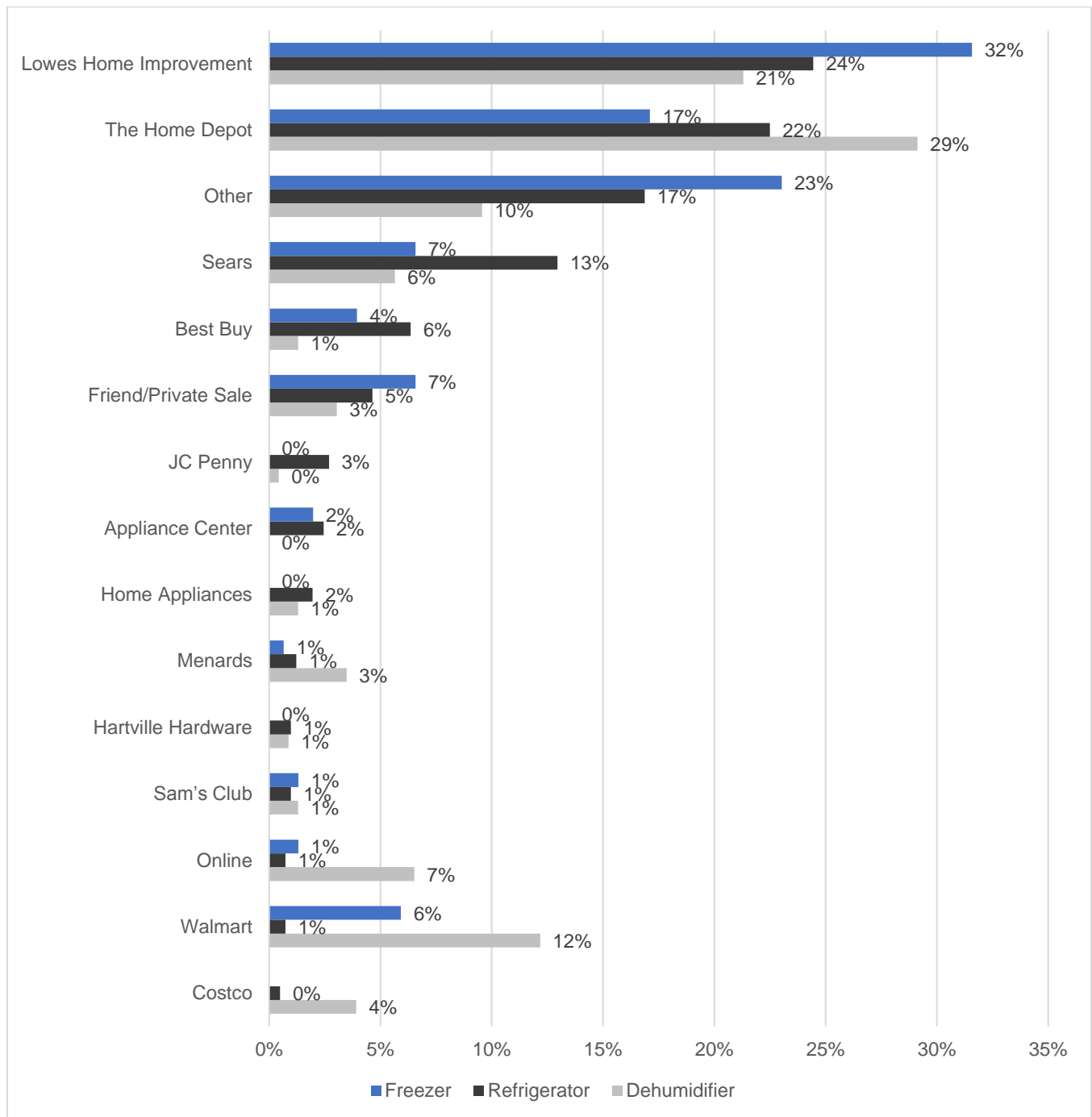


Figure Notes: (1) Multiple selection question – customers could select multiple retail stores where they purchased appliances during 2017, so percentages for each individual measure do not total 100%. (2) Other response category includes local appliance and hardware stores, such as Aaron's; ABC Warehouse;

B & B Hardware; BJ's; Benard's; Bloom Brothers; Cleveland Housing Network; Dailey's Appliances; Eastside Maytag; HH Gregg; Sheely's; Stuart's; among others.

Refrigerator purchasers are typically purchasing the unit to replace another functioning or broken refrigerator as opposed to a new application (85%). By comparison, dehumidifier and freezer purchasers were more likely to purchase a unit that was not a replacement purchase (49% for dehumidifier purchasers; 54% for freezer purchasers.)

The majority of survey respondents report that they do not know that their utility provides funds to reduce the price of appliances purchased at retail stores. Customers who purchased refrigerators (a downstream measure which advertises rebates for customers) were slightly more likely to report awareness of utility sponsorship, at 16%, compared to customers who purchased freezers and dehumidifiers.

Figure 5-7. Customer Awareness that the Utility Provides Funds to Reduce Price of Appliances

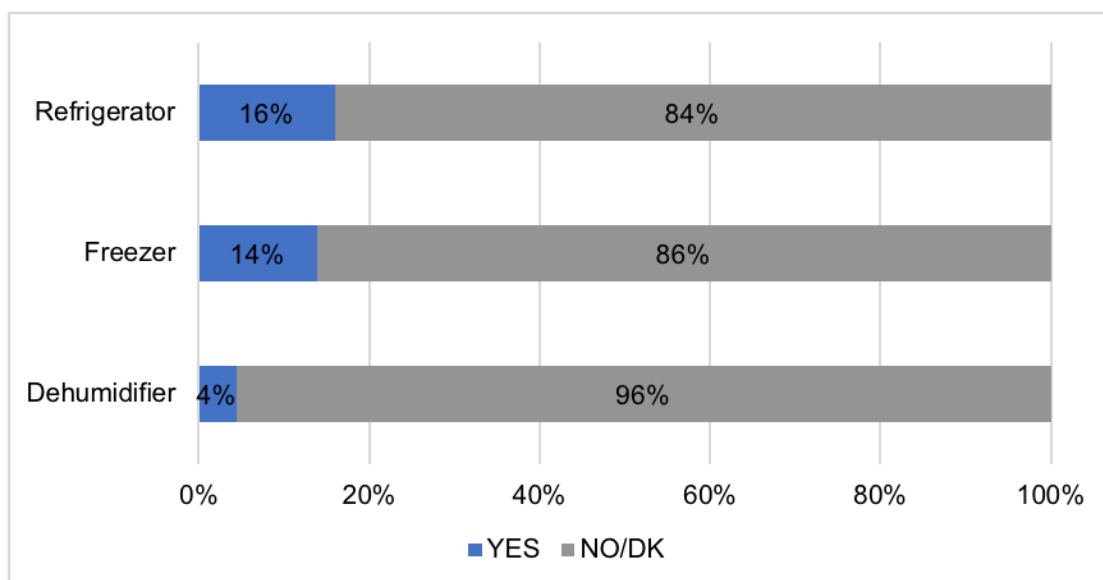


Figure Note: Denominator differs by measure. Refrigerators: n=462; Freezers: n=172; Dehumidifiers: n=248.

However, even among refrigerator purchasers, most report that they either do not believe or do not know if the refrigerator that they purchased during 2017 was discounted through their utility. The survey did not specifically assess whether customers had received rebates for purchased appliances.

Figure 5-8. Awareness that Appliance Purchases were Discounted Through Utility

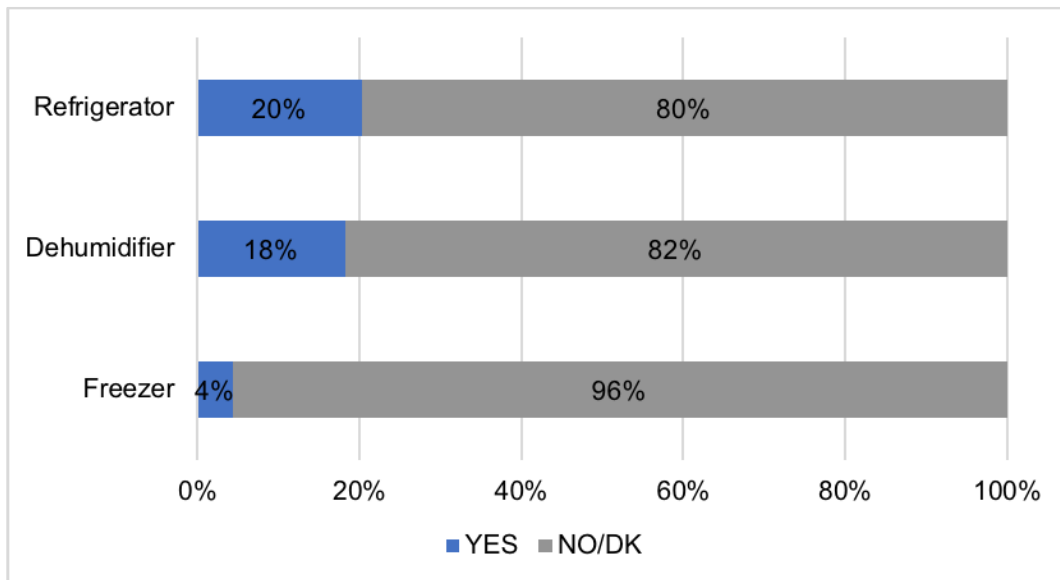


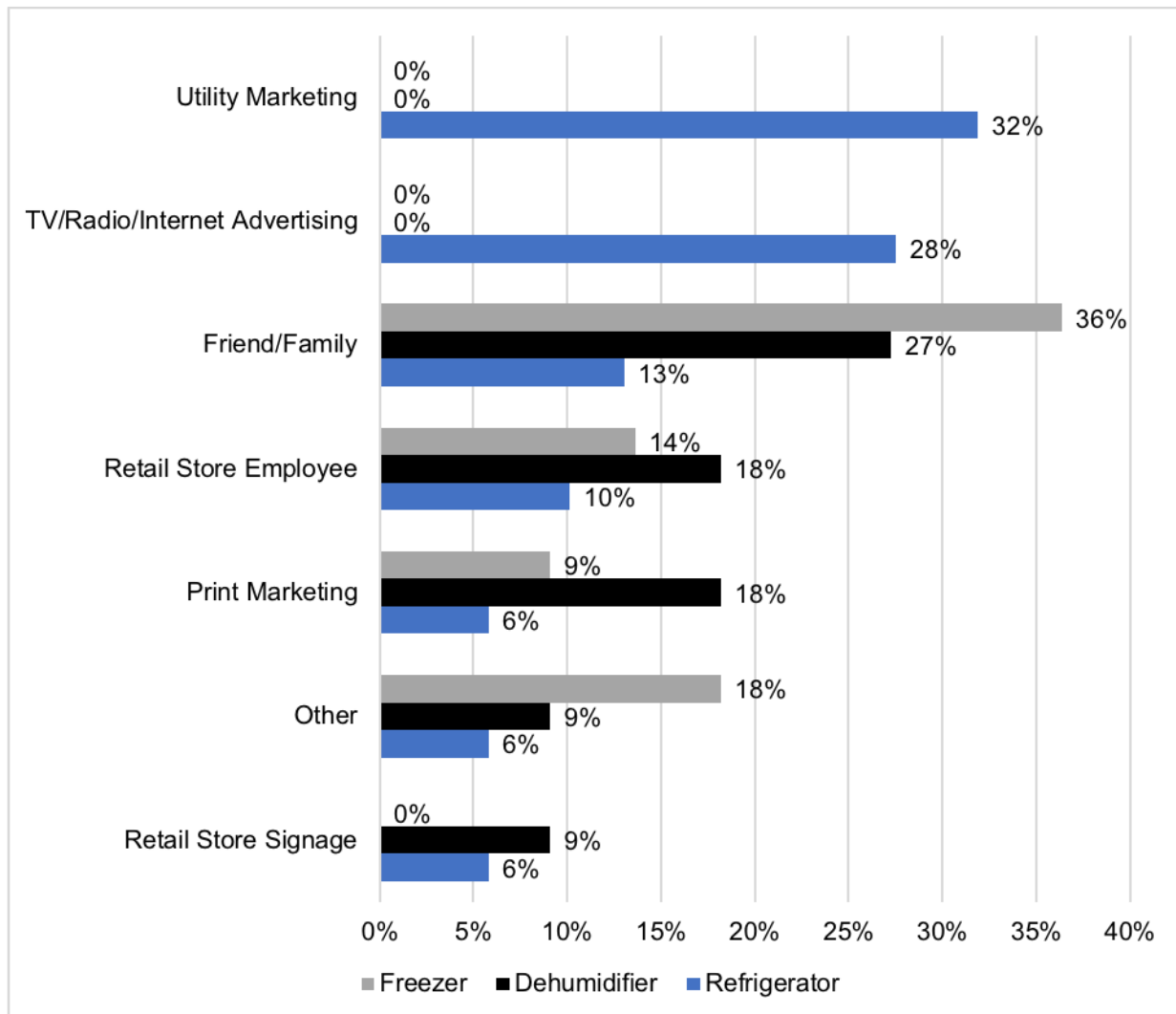
Figure notes: Denominator includes customers who reported that they do know that their utility provides funds to reduce the price of [measure] at retail stores. Refrigerators: n=74; Dehumidifiers: n=23; Freezers: n=2 of 11.

Among the appliance purchasers who reported that they were aware that their utility sponsors funds to reduce the price of appliances at retail stores, customers most frequently learn about discounts from:

- Utility marketing for refrigerators; and
- Friends/family for freezers and for dehumidifiers.

Interestingly, retail store signage and retail store employees were not a significant source of awareness of utility sponsorship for customers purchasing any of the three appliance measures.

Figure 5-9. Source of Customer Awareness of Appliance Discounts



Appliance Customer Findings – Mobile In-Store Survey

A total of 47 customers who completed the mobile survey reviewed appliance products. Specifically, 25 customers reviewed midstream appliance products and 22 customers reviewed downstream appliance products. Appliances customers looked at include:

- Freezers (13)
- Refrigerators (10);
- Clothes washers and/or clothes dryers (12); and
- Dehumidifiers (1).¹²

¹² Numbers do not total 25 customers reviewing midstream and 22 customers reviewing downstream appliance products; some customers did not state product being reviewed.

Appliance signage appears to be fairly prevalent in retail stores. About three-quarters of mobile survey respondents said they saw Companies' flyers, signs, posters, or stickers advertising rebates or instant discounts (17 downstream and 17 midstream appliance respondents). However, this means about a quarter of respondents (13 out of 47) did not see any signage.

Midstream appliance reviewers most commonly report that the primary message they saw on program signage related to energy bill savings over time (14), while downstream appliance reviewers most commonly describe messaging related to available rebates and money savings (13). This aligns with messaging contained on program signage for midstream and downstream appliances.

Approximately half of all customers reviewing midstream and downstream appliances report that the signage is:

- Easy to find (15 and 14, respectively);
- Easy to understand (15 and 14, respectively); and
- Informative (14 and 14, respectively).

Fewer respondents report that signs are attention-grabbing (11 and 7, respectively).

Among customers who reviewed downstream appliances, approximately half (12) stated that the signs clearly show which products qualify for rebates.

Half of the respondents reported that after reviewing the program signage, they are likely or extremely likely to purchase a more efficient option for the product they reviewed (14 midstream appliance reviewers; 15 downstream appliance reviewers). Among midstream appliance reviewers, 14 also stated that they are either likely or highly likely to purchase the product they are reviewing the next time they need an appliance, while only seven downstream appliance reviewers similarly stated that they are likely to purchase the product they reviewed the next time they need an appliance.

The figures below provide examples of in-store signage, as seen by mobile survey respondents. As seen, dehumidifier program signage emphasizes upgrading for huge savings, whereas clothes washer signage emphasizes available rebates.

Figure 5-10. Dehumidifier Program Signage



Figure 5-11. Washer Program Signage



The majority of appliance mobile respondents did not speak with a sales associate while reviewing their appliance products. Thirteen out of the 47 respondents said they communicated with a sales associate (eight midstream and five downstream respondents). Sales associates most commonly discussed cost (four midstream appliance purchases; two downstream appliance purchasers) and available rebates (for downstream products). Combined with earlier findings, this may indicate an additional opportunity to train retail stores staff to communicate issues related to cost, available rebates, and energy savings, to the customer.

Similar to findings for the Lighting and Consumer Electronics sub-programs, mobile survey respondents report that sales associates did not direct them to the energysaveohio.com website for additional information on the program or qualifying products.

6. Consumer Electronics

The purpose of this chapter is to present the consumer electronics findings of the impact and process evaluation effort undertaken by ADM to verify the energy savings and peak demand reduction.

6.1 Description of Consumer Electronics Program

The Consumer Electronics (CE) sub-program provides financial incentives and support to retailers that sell energy efficient products such as ENERGY STAR® qualified consumer electronics. The rebates are designed to encourage the purchase and installation of energy efficient televisions, computers, and computer monitors that will reduce the consumption and reduces summer peak load demands.

Consumer electronic products that were rebated in 2017 include:

- Televisions
- Computers
- Computer Monitors
- Imaging

Table 6-1 presents the number of rebates issued by EDC and measure, Table 6-2 presents kWh savings by EDC and measure, and Table 6-3 present kW savings by EDC and measure.

Table 6-1: Consumer Electronics Rebates by EDC and Measure

Measure	CEI	OE	TE	Total
Televisions	2,102	2,187	656	4,945
Computers	291	242	75	608
Computer Monitors	70	68	13	151
Imaging	362	378	87	827
Totals	2,825	2,875	831	6,531

Table 6-2: Ex Ante Consumer Electronics kWh Savings by EDC and Measure

Measure	CEI	OE	TE	Total
Televisions	576,199	491,575	128,686	1,196,460
Computers	90,321	93,296	22,967	206,584
Computer Monitors	6,048	5,136	2,448	13,632
Imaging	33,692	29,003	7,997	70,692
Totals	706,260	619,010	162,098	1,487,368

Table 6-3: Ex Ante Consumer Electronics kW Savings by EDC and Measure

Measure	CEI	OE	TE	Total
Televisions	53.75	45.85	12.01	111.61
Computers	12.22	12.62	3.11	27.95
Computer Monitors	0.81	0.68	0.33	1.82
Imaging	6.88	5.92	1.63	14.43
Totals	73.65	65.07	17.07	155.80

6.2 Impact Evaluation Methodology

The following section details the methods used to calculate energy savings and demand reductions for the Consumer Electronics sub-program.

6.2.1 Sampling Plan

Random Digit Dialing

Telephone surveys were conducted with a sample of 3,600 customers across all three Companies.

The final sample size meets Ohio's standards for achieving a relative precision of $\pm 10\%$ at the 90% confidence interval for each service territory. The sample size calculation for achieving 90% confidence with 10% precision is shown in the formula below.

Equation 4: Minimum Sample Size Formula for 90 percent Confidence

$$n_0 = \frac{N \times \frac{1}{4}}{(N - 1) \times \frac{D^2}{Z_{\alpha/2}^2}}$$

Where:

n_0 = Minimum sample size

N = Population size, assumed to be 100,000 or greater

$Z_{\alpha/2}$ = Z value at 90% confidence interval, 1.645

$\frac{1}{4}$ = The maximum value of $p(1-p)$ at $p=1/2$, a conservative estimate for sample size

D = Relative Precision (0.10)

ADM selected a sample size of 3,600 random dialing survey complete to ensure adequate respondents across the various distribution channels, program types, and measure categories. The survey data was used across multiple programs including the consumer electronics component of EEP.

6.2.2 Verification of Measures Rebated

Ex ante Review

ADM conducted an ex ante review of the program's final 2017 database. In this review, the following activities were performed.

- Verification of rebate status as completed
- Verification of measure rebate requirements (e.g., ENERGY STAR® qualified status)
- Verification that data set does not include duplicate or erroneous data entries
- Confirming data entries include all necessary fields for savings calculations

ADM verified all measure data to be accurate and consistent with program requirements.

- The energy savings and demand reductions are claimed in accordance with the applicable TRM

Customer Surveys and Field Verification

The M&V data collection process consists of customer surveys and visual verification of measures with a subset of customers. Participants were asked if they purchased a television, computer monitor, scanner, or printer and asked if the purchased item is in use.

Review of Consumer Electronics Invoices

ADM completed a review of a census of SSRS records and their associated invoices. This review determined the level of correlation between SSRS records and associated invoices from participating Consumer Electronics manufacturers. ADM determined that all invoiced equipment was accounted for in the SSRS database.

6.2.3 Energy Savings and Peak Demand Reduction Calculations

ADM used the deemed values for energy savings and peak demand reduction from the PA TRM for all measures except scanners which was obtained using the department of energy calculator. Deemed saving values are shown in **Error! Reference source not found.** and **Error! Reference source not found.**

Computers

ADM verified all model numbers in the AEG database were listed in the Energy Star® computer database. The computer type was verified and used to apply the appropriate deemed savings.

Imaging

Imaging includes several measures revolving around imaging technology for the home office. Measures for the 2017 project year include scanners, printers, and multi-function devices. Imaging savings algorithms are based on the PA TRM. The savings values are all deemed and listed below.

Imaging equipment was checked based on the Energy Star® database for its rating and the type of imaging equipment specifically is. Specifications were also checked using the Energy Star® database and from these findings, the appropriate savings were chosen. The only notable difference in savings calculation between imaging equipment measures is that scanners deemed savings were pulled from energy.gov since there were no OH TRM or PA TRM deemed savings listed for this measure.

Monitors

Computer monitor savings are deemed from the PA TRM.

Monitors on the Company's database were researched via Energy Star® database to verify their rating. Verified monitors were given the deemed savings.

Table 6-4: kWh & kW Values for Office Equipment

Measure	Energy Savings Annual kWh	Summer Peak Demand Savings kW
Computer (Desktop)	119	0.0161
Computer (Laptop)	22	0.003
Fax Machine (laser)	16	0.0022
Copier (monochrome)		
images/min ≤ 5	37	.005
5 < images/min ≤ 15	26	0.0035
15 < images/min ≤ 20	9	0.0012
20 < images/min ≤ 30	42	0.0057
30 < images/min ≤ 40	50	0.0068
40 < images/min ≤ 65	186	0.0251
65 < images/min ≤ 82	372	0.0502

Measure	Energy Savings Annual kWh	Summer Peak Demand Savings kW
82 < images/min ≤ 90	469	0.0633
images/min > 90	686	0.0926
Printer (laser, monochrome)		
images/min ≤ 5	37	0.005
5 < images/min ≤ 15	26	0.0035
15 < images/min ≤ 20	23	0.0031
20 < images/min ≤ 30	42	0.0057
30 < images/min ≤ 40	50	0.0068
40 < images/min ≤ 65	181	0.0244
65 < images/min ≤ 82	372	0.0502
82 < images/min ≤ 90	542	0.0732
images/min > 90	686	0.0926
Printer (Ink Jet)	6	0.0008
Multifunction (laser, monochrome)		
s ≤ 5	57	0.0077
5 < s ≤ 10	48	0.0065
10 < s ≤ 26	52	0.007
26 < s ≤ 30	93	0.0126
30 < s ≤ 50	248	0.0335
50 < s ≤ 68	420	0.0567
68 < s ≤ 80	597	0.0806
s > 80	764	0.1031
Multifunction (Ink Jet)	6	0.0008
Monitor	24	0.0032
Scanner ¹³	10	0

Televisions

Television savings are deemed from the PA TRM.

Television savings are based on deemed values from the PA TRM. The savings depend on the size of the television. The Company's listed models were researched via the

¹³ Used for Scanner Savings since there are no deemed values in the OH TRM or PA TRM for this measure. The calculator is provided by the department of energy in the following web address: <https://energy.gov/eere/femp/energy-and-cost-savings-calculators-energy-efficient-products>

Energy Star® database where their Energy Star® rating was verified and the diagonal screen sizes were reviewed. Models that were not found through a lookup were verified manually through Energy Star®, manufacturer, and credible third-party online sites. Within the deemed savings for televisions is a second rating where the PA TRM gives models meeting maximum power loads (P_{Max}), which are calculated using diagonal sizes to find the area, additional deemed savings. The equation is given below.

Equation 5: P_{Max} for Most Energy Efficient Rating¹⁴

$$P_{Max} = 65.5 \times \tanh(0.00046(Area - 140) + 0.01) 14.5$$

If a televisions power consumption during ‘On Mode’ is higher than the calculated P_{Max} value, then it does not qualify for the additional savings.

Table 6-5: kWh & kW Values for Televisions

Diagonal Screen Size (inches)[1]	TV kWh		TV kW	
	Energy Savings ENERGY STAR V. 6.0 TVs (kWh/year)	Energy Savings ENERGY STAR Most Efficient TVs (kWh/yr)	Coincident Demand Savings ENERGY STAR V. 6.0 (kW)	Coincident Demand Savings ENERGY STAR Most Efficient (kW)
< 20	1	3	0.00005	0.0003
20 < 30	15	20	0.0014	0.0019
30 < 40	34	43	0.0031	0.004
40 < 50	52	66	0.0049	0.0062
50 < 60	63	82	0.0059	0.0076
≥ 60	65	85	0.006	0.0079

6.3 Process Evaluation Methodology

Process evaluation methodology used to evaluate the Consumer Electronics sub-program is described in chapter 4.

¹⁴ The recognition criteria for the ‘Most Energy Efficient TVs’ from Energy Star can be found on the following link

https://www.energystar.gov/ia/partners/downloads/most_efficient/2015/Final_ENERGY_STAR_Most_Efficient_2015_Recognition_Criteria_Televisions.pdf?60be-105c.

6.4 Detailed Impact Evaluation Findings

This section provides detailed evaluation findings based on the methodologies that were explained above.

The *ex post* energy savings for the Consumer Electronics sub-program totaled 1,527,764 kWh and *ex post* peak load demand reduction totaled 171 kW. *Ex ante* estimates were highly accurate as the realization rates for this sub-program were 102% and 109% respectively.

Table 6-6, Table 6-7, and Table 6-8 below show the *ex post* kWh and kW savings per measure across each EDC and the totals.

Table 6-6: Consumer Electronics Ex Post Energy (kWh) Savings by Type of Measure

Measure	CEI	OE	TE	Total
Televisions	584,889	499,573	130,882	1,215,344
Computers	90,321	93,296	22,967	206,584
Computer Monitors	6,048	5,136	2,448	13,632
Imaging	44,206	36,931	11,067	92,204
Totals	725,464	634,936	167,364	1,527,764

Table 6-7: Consumer Electronics Ex Post Peak Load Demand (kW) Savings by Type of Measure

Measure	CEI	OE	TE	Total
Televisions	53.73	45.91	12.03	111.67
Computers	12.22	12.62	3.11	27.95
Computer Monitors	0.81	0.68	0.33	1.82
Imaging	14.09	12.27	3.24	29.60
Totals	80.85	71.49	18.70	171.04

Table 6-8: Consumer Electronics Ex Post Totals

Measure	Ex Ante kWh	Ex Ante kW	Ex Post kWh	Ex Post kW	kWh RR	kW RR
Televisions	1,196,460	111.61	1,215,344	111.67	101.6%	100.1%
Computers	206,584	27.95	206,584	27.95	100.0%	100.0%
Computer Monitors	13,632	1.82	13,632	1.82	100.0%	100.0%
Imaging	70,692	14.43	92,204	29.60	130.4%	205.2%
Totals	1,487,368	155.80	1,527,764	171.04	102.7%	109.8%

6.5 Detailed Process Evaluation Findings

The Consumer Electronics sub-program provides midstream incentives for qualifying products, including televisions; imaging/printing/scanning equipment; computers; and computer monitors.

According to the Companies' program website, qualifying appliances can be purchased from Best Buy and Sears. The program data analysis reveals that Sears sold televisions during 2017, while Best Buy sold products in all four categories (televisions; imaging/printing/scanning equipment; computers; and computer monitors).

To learn more about energy efficient products within Consumer Electronics, customers are directed to the home page of the Energystar.gov website.

Consumer Electronics Signage

The evaluation team reviewed two different pieces of signage that are placed on Consumer Electronics products. These include the Companies' incentive sideline piece of signage and the Companies' railcard. Both signs contain messaging:

- That the product will save money and save energy; and
- That the product is an *"energy efficient featured product"*.

In addition, the incentive sideline signage notes that the retailer is collaborating with the Companies to provide the customer with quality, energy saving products. The railcard advertises that *"energy savings start here."*

Consumer Electronics Customer Findings – General Population Survey

This section includes findings from the general population survey of the Companies' customers.¹⁵ The survey attempted to identify customers' purchasing patterns related to program qualifying equipment, including computers, computer monitors, printing/imaging devices, televisions smaller than 40", televisions 40" or larger.¹⁶

Televisions 40" or larger were the most commonly purchased Consumer Electronics measure among survey respondents, with 18% of survey respondents purchasing this measure.

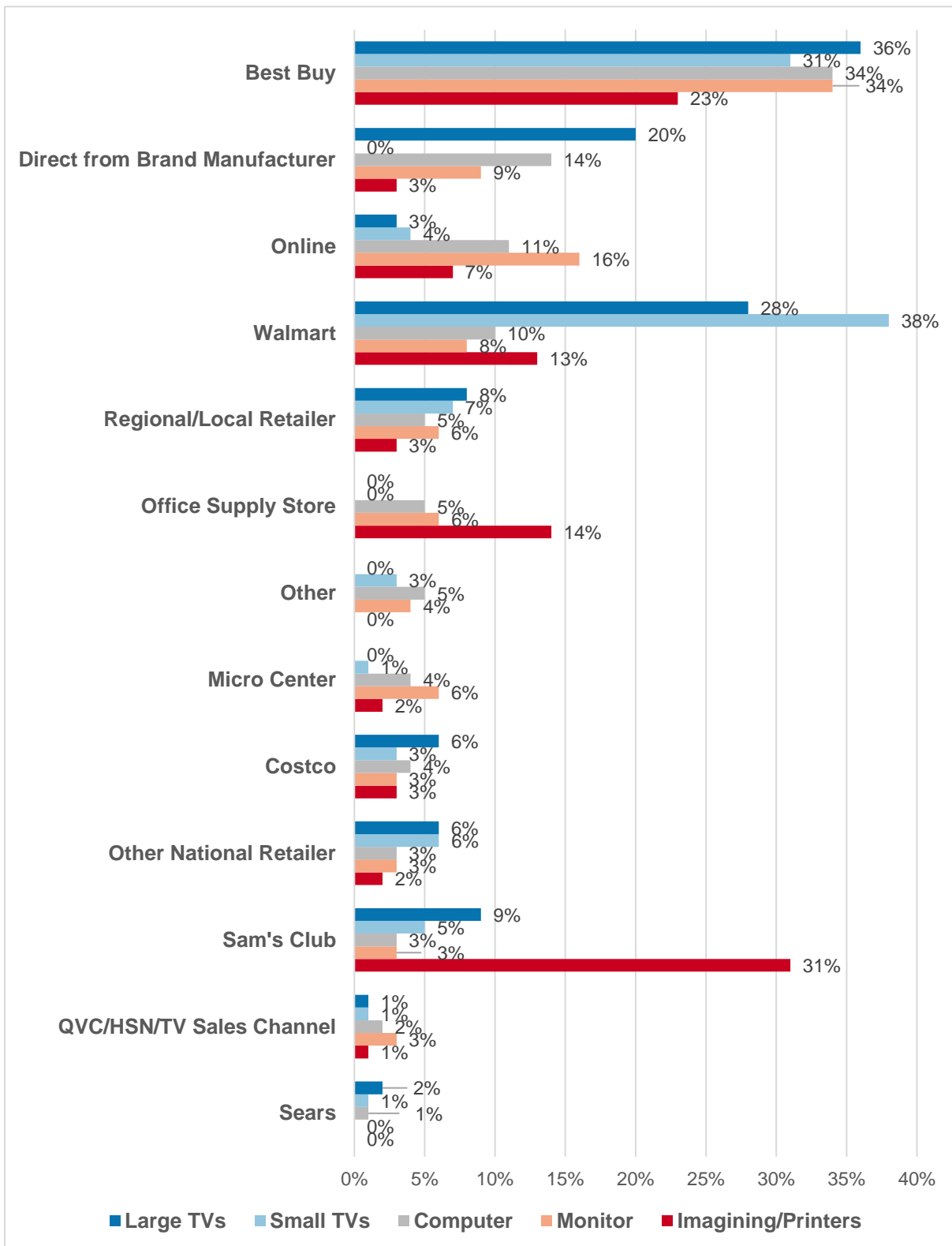
¹⁵ This was a random digit dial survey of the Companies customers.

¹⁶ The survey also assessed lighting, HVAC measures, including room air conditioners; central air conditioners; heat pumps; and mini-split heat pumps.

*Table 6-9. Number of Customers Who Purchased Consumer Electronics Measures
(n=3,600)*

Measure	% Survey Respondents Who Purchased Measure
Computers	13%
Computer monitors	6%
Printing/imaging devices	13%
Televisions smaller than 40"	9%
Televisions 40" or larger	18%

Figure 6-1: Where Survey Respondents Purchased Consumer Electronics



Similar to findings for the Lighting and Appliances sub-programs, the majority of survey respondents report that they do not know that their utility provides funds to reduce the price of consumer electronics purchased at retail stores. Approximately 5%-7% of customers report that they are aware that their utility provides these funds.

Figure 6-2. Awareness that the Utility Provides Funds to Reduce Price of Consumer Electronics

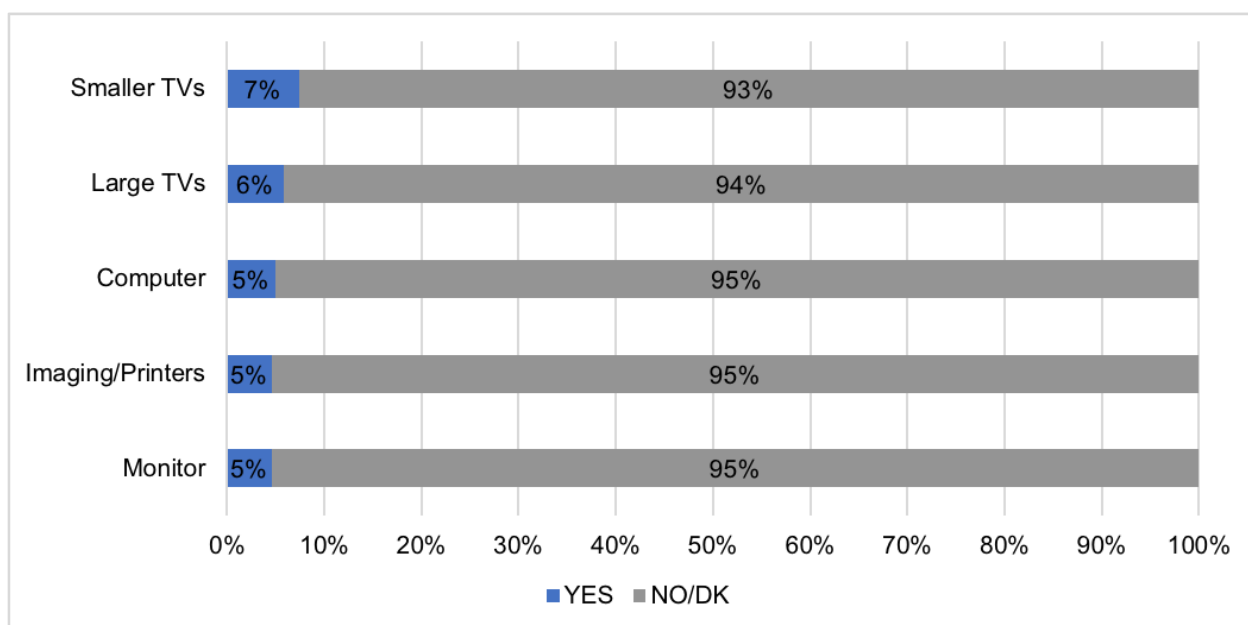


Figure Note: Denominator varies by measure. Smaller TVs: n=337; Large TVs: n=648; Computers: n=481; Imaging/Printers: n=218; Computer Monitors: n=451.

Among the consumer electronics purchasers who reported that they were aware that their utility sponsors funds to reduce the price of consumer electronics at retail stores, customers most frequently learn about these promotions from:

- Utility marketing for all five Consumer Electronics measures; and
- TV/radio/internet advertising.

Few customers reported hearing about Consumer Electronics promotions for the program from retail store signage, and even fewer reported hearing about these promotions from retail store employees. It should be noted that the total number of customers answering this survey question was very small; as such, these numbers should be interpreted with caution.

Figure 6-3: Source of Customer Awareness of Appliance Discounts

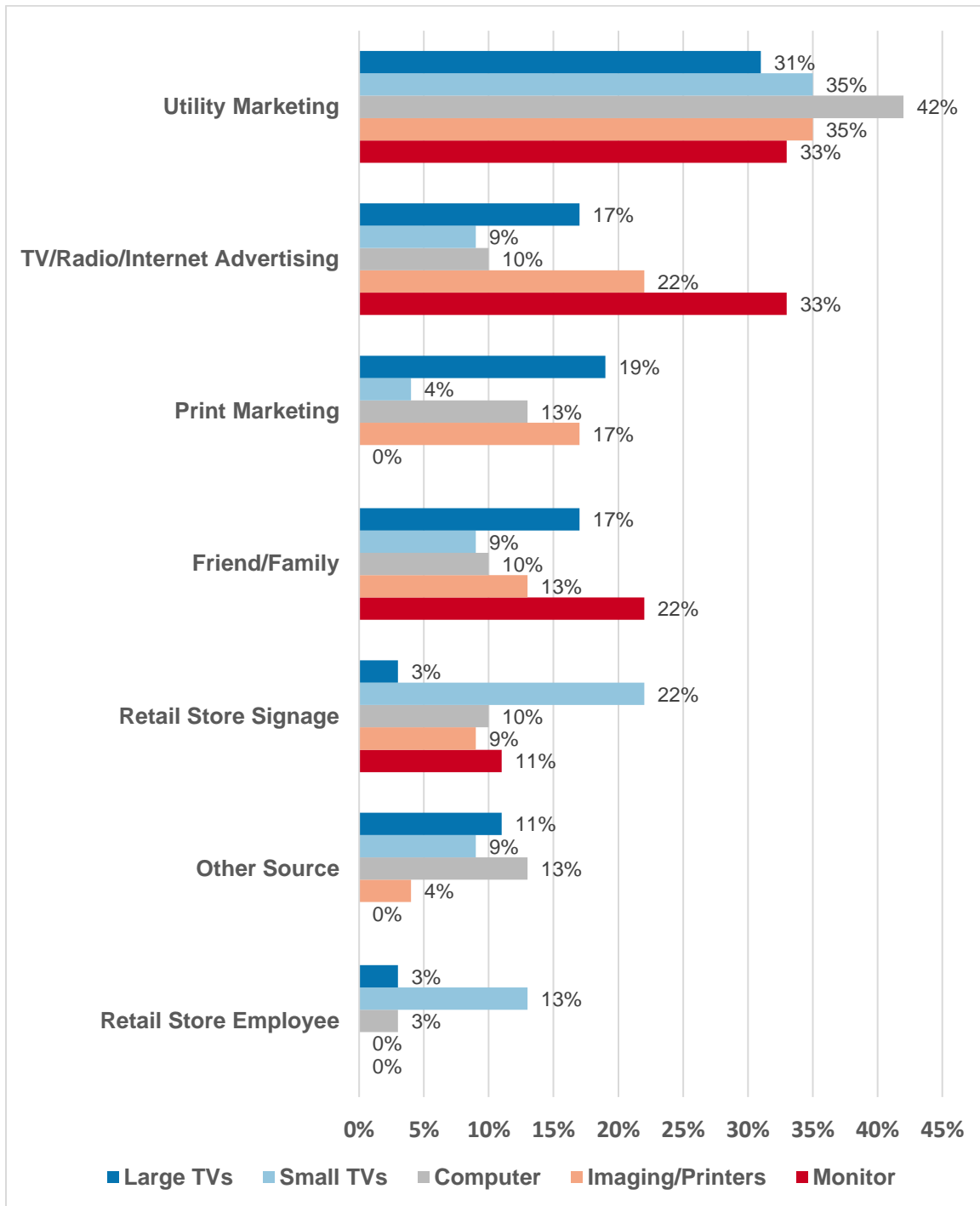


Figure Note: (1) Denominator varies by measure: Computers: n=31; Computer Monitors: n=9; Imaging/Printers: n=23; Smaller TVs: n=23; Large TVs: n=36. (2) Other response categories include agency; general awareness; through work; around the city; through this survey.

Consumer Electronics Customer Findings – Mobile In-Store Survey

A total of seven customers who completed the mobile survey reviewed consumer electronics products. Customers reviewed:

- Computers: 5
- Televisions: 2

Among the customers who reviewed consumer electronics products, four reported that they saw the Companies' flyers, signs, posters, or stickers advertising long-term energy savings if they purchased the product they were reviewing. Respondents were able to easily find the products highlighted in program signage (three).

Customers report that the most prominent messages were that the featured product is energy efficient and/or can result in dollar savings over time (four).

Of the four customers that saw the signage, three said it was easy to find; informative, and easy to understand. A few customers said the signs were attention-grabbing.

Based on the very limited number of mobile survey completes in this group, it appears the information may be influential in customers' decisions. Three of the four respondents that saw the signs said they are likely or extremely likely to purchase a more efficient option for the product they reviewed. In addition, all respondents reported a high likelihood to purchase the product they reviewed, based on the in-store advertisements, the next time they are shopping for a similar product (four).

Sales associates provided limited information related to qualifying electronics to respondents when in-store. Most consumer electronics mobile respondents spoke with a sales associate while reviewing their consumer electronic product (five out of seven). However, of these, only three stated that the sales associate showed them efficient product options. Sales associates emphasized functionality (three) and energy savings (three), followed by cost (two). Only one mobile survey respondents reported that sales associates directed them to the energysaveohio.com website for additional information.

7. Lighting

The purpose of this chapter is to present the consumer electronics findings of the impact and process evaluation effort undertaken by ADM to verify the energy savings and peak demand reduction.

7.1 Description of Lighting Program

The program provides financial incentives and support to retailers that sell energy-efficient lighting. The rebates are designed to encourage the purchase and installation of energy efficient lighting that will reduce electricity consumption and reduce summer peak load demands. Lighting that was rebated in 2017 include:

- LEDs
- LED Fixtures

Table 7-1 presents the number of lighting rebates by EDC and measure, Table 7-2 presents kWh savings by EDC and measure, and Table 7-3 present kW savings by EDC and measure.

Table 7-1: Ex ante Lighting Rebates by EDC and Measure

Measure	CEI	OE	TE	Total
LED Fixtures	368	850	140	1,358
LED Bulbs	26,630	46,148	10,447	83,225
LED Bulbs Appliance Turn In	14,660	23,032	5,976	43,668
Totals	41,658	70,030	16,563	128,251

Table 7-2: Ex Ante Lighting kWh Savings by EDC and Measure

Measure	CEI	OE	TE	Total
LED Fixtures	142,623	183,907	87,092	413,622
LED Bulbs	26,505,764	33,697,933	9,703,129	69,906,825
LED Bulbs Appliance Turn In	713,309	1,120,675	290,790	2,124,774
Totals	27,361,696	35,002,515	10,081,010	72,445,222

Table 7-3: Ex Ante Lighting kW Savings by EDC and Measure

Measure	CEI	OE	TE	Total
LED Fixtures	17.02	21.96	10.39	49.37
LED Bulbs	3,169.18	4,030.88	1,160.31	8,360.37
LED Bulbs Appliance Turn In	85.13	133.75	34.71	253.59
Totals	3,271.33	4,186.58	1,205.42	8,663.33

7.2 Impact Evaluation Methodology

The following section details the methods used to calculate energy savings and demand reductions for the Lighting sub-program.

7.2.1 Sampling Plan

Random Digit Dialing

Telephone surveys were conducted with samples of 3,600 customers across all the Companies.

The sample size for the follow-up surveys in each service territory meets Ohio's standards for achieving a relative precision of $\pm 10\%$ at the 90% confidence interval. The sample size calculation for achieving 90% confidence with 10% precision is shown in the formula below.

Equation 6: Minimum Sample Size Formula for 90 percent Confidence

$$n_0 = \frac{N \times \frac{1}{4}}{(N - 1) \times \frac{D^2}{Z_{\alpha/2}^2}}$$

Where:

n_0 = Minimum sample size

N = Population size, assumed to be 100,000 or greater

$Z_{\alpha/2}$ = Z value at 90% confidence interval, 1.645

$\frac{1}{4}$ = The maximum value of $p(1-p)$ at $p=1/2$, a conservative estimate for sample size

D = Relative Precision (0.10)

ADM selected a sample size of 3,600 for allocating respondents across the various distribution channels. The survey data was used across multiple programs and the quantity of completes ensures precision is met by measure type for each program.

7.2.2 Verification of Measures Rebated

Ex Ante Review

ADM conducted an ex ante review of the program's final 2017 database. In this review, the following activities were performed.

- Verification of rebate status as completed.
- Verification of measure rebate requirements (e.g., ENERGY STAR® qualified status).
- Verification that data set does not include duplicate or erroneous data entries.
- Confirming data entries include all necessary fields for savings calculations.

Customer Surveys

The M&V data collection process consists of customer surveys and visual verification of measures with a subset of customers. Visual verification of measures was conducted by one of ADM's field service technicians.

In-Service Rates (ISRs) were calculated for the program by analyzing the data from a random digit dialing survey conducted in the companies' service territory. Customers were asked if they purchased LED light bulbs or fixtures during 2017, how many they purchased, and how many they hadn't installed yet.

Review of Consumer Electronics Invoices

ADM completed a review of SSRS records and a subset of their associated invoices¹⁷. This review informed the level of correlation between SSRS records and associated invoices from participating Consumer Electronics manufacturers. ADM determined that all equipment listed in the SSRS database was accounted for by their associated invoices.

7.2.3 Energy Savings and Peak Demand Reduction Calculations

ADM has analyzed data from follow-up telephone surveys to verify annual *ex post* energy savings associated with the various distribution channels. EDC customers from the retail channel were surveyed to determine installation rates, residential installation locations, characteristics of the light bulbs replaced, and dates of installation. This information was

¹⁷ ADM reviewed 413 of the 508 (~81%) of associated invoices.

used to calculate annual energy *ex post* savings in accordance with the formula specified in the PA TRM with adjustments to fit the Ohio area.

Equation 7: Annual Energy Savings-LEDs

$$kWh\ Savings = \frac{Watts_{base} - Watts_{EE}}{1000} \times HOU \times (1 + IE_{kWh}) \times 365.25days/yr \times ISR$$

Where:

- Watts_{base} = Effective baseline wattage
- Watts_{EE} = Watts of LED
- ISR = In Service Rate or percentage of units rated that get installed
- HOU = Average hours of use per day = 2.85 hrs per day (from Ohio TRM)
- IE_{kWh} = HVAC interactive effect for LEDs (from Ohio TRM)
 - To account for effects on heating/cooling from efficient lighting

Methodologies for determining these variables are described in the remainder of this section.

ADM checked bulb/fixture model numbers listed in the tracking databases maintained by Honeywell against ENERGY STAR® databases (www.energystar.gov) to verify that each bulb distributed in 2017 is (i) ENERGY STAR® qualified and (ii) assigned the correct Watts per bulb by the implementer. ADM used the determined Hours of Use for LED fixtures/bulbs from Ohio TRM deemed hours. While accounting for the quantity of the bulbs, ADM verified the items are installed. The delta-watts ratio is the difference in wattages between baseline and retrofit bulbs divided by the wattage of the retrofit bulb. Installing energy efficient lighting such as LEDs in air-conditioned spaces saves electricity in two ways: first by reducing lighting electrical loads; and second by introducing less heat in conditioned spaces, hence incrementally decreasing space cooling loads. Space heating and cooling impacts of energy efficient lighting are described using a ratio that is referred to in the OH TRM as the HVAC interactive effect (IE_{kWh}).

In-Service Rate (ISR)

The Ohio TRM defines ISR as the “percentage of units rebated that get installed.” ADM measured the ISR using the following methodology:

Three data elements were collected through surveys which resulted in an ISR estimate for 2017. These elements are as follows:

- 1) The number of Bulbs/fixtures sold: The survey determined the number of bulbs/fixtures purchased by a customer.
- 2) The number of Bulbs/fixtures not installed by the end of the program year.

The ISRs for 2017 were calculated as one minus the sum of Data Element 2 divided by Data Element 1.

Calculation of *Ex Post* Summer Peak Demand Savings

Equation 8: Summer Peak Demand Savings

$$\Delta kW_{peak} = \frac{Watts_{base} - Watts_{ee}}{1000} \times CF \times (1 + IE_{kWh}) \times ISR$$

Where:

- Watts_{base} = Effective baseline wattage
- Watts_{ee} = Watts of LED
- ISR = In Service Rate or percentage of units rated that get installed
- CF = Summer Peak Coincidence Factor for measure = 0.11 (from Ohio TRM)
- IE_{kW} = HVAC interactive effect for LED demand = 0.21 (from Ohio TRM)

Values specified in the TRM will be used for WHFd and CF in calculating summer coincident peak demand savings, with WHFd = 1.21 and CF = 0.11.

7.3 Process Evaluation Methodology

Process evaluation methodology used to evaluate the Lighting sub-program is described in chapter 4. This section will provide detailed impact evaluation findings based on the methodologies that were detailed in the sections above.

7.4 Detailed Impact Evaluation Findings

The *ex post* energy savings for the Lighting sub-program totaled 62,878,154 kWh and *ex post* peak load demand reduction totaled 7,514 kW. Realization rates for this sub-program were 87% and 87% respectively. Variation from the *ex ante* value can be explained by the differences in the in service rates applied to the savings calculations. An ISR of 92% from the PA TRM was utilized for *ex ante* calculations and ISRs of 78% for LED bulbs and 86% for LED fixtures were identified via a random digit dialing survey.

Table 7-4, Table 7-5, and Table 7-6 below show the Ex Post kWh and kW savings per measure across each EDC and the totals.

Table 7-4: Lighting Ex Post Energy (kWh) Savings by Type of Measure

Measure	CEI	OE	TE	Total
LED Fixtures	107,833	144,703	66,023	318,559
LED Bulbs	22,963,952	29,144,872	8,382,227	60,491,051
LED Bulbs Appliance Turn In	697,859	1,089,292	281,393	2,068,544
Totals	23,769,644	30,378,867	8,729,643	62,878,154

Table 7-5: Lighting Ex Post Peak Load Demand (kW) Savings by Type of Measure

Measure	CEI	OE	TE	Total
LED Fixtures	12.89	17.29	7.89	38.07
LED Bulbs	2,744.14	3,482.74	1,001.66	7,228.54
LED Bulbs Appliance Turn In	83.39	130.17	33.63	247.19
Totals	2,840.42	3,630.20	1,043.17	7,513.79

Table 7-6: Lighting Ex Post Totals

Measure	Ex Ante kWh	Ex Ante kW	Ex Post kWh	Ex Post kW	kWh RR	kW RR
LED Fixtures	413,622	49.37	318,559	38.07	77%	77%
LED Bulbs	69,906,825	8,360.37	60,491,051	7,228.54	87%	86%
LED Bulbs Appliance Turn In	2,124,774	253.59	2,068,544	247.19	97%	97%
Totals	72,445,222	8,663.33	62,878,154	7,513.79	87%	87%

7.5 Detailed Process Evaluation Findings

The Lighting sub-program provides instant discounts on LED bulbs and LED fixtures at participating retail stores.

According to the Companies' Lighting Discount Search Tool on the program website, a wide variety of bulbs are eligible for instant discounts.

Table 7-7. Retail Store Participation and Lighting Variety

Retailer	Manufacturers	# Eligible bulbs
Costco	FEIT	8
The Home Depot	Ecosmart Phillips	24 43
Lowe's	GE	5

Retailer	Manufacturers	# Eligible bulbs
Menard's	FEIT	4
Walmart	GE	68
	Great Value	56
	Hampton	26
	Phillips	9

Retailer training and communication is critical, as noted earlier, to ensure that sales associates can discuss which bulbs qualify for instant discounts with customers. This may be particularly important at stores that stock a wide variety of eligible bulbs (i.e., Walmart).

7.5.1 Lighting Signage

Lighting signage appears to be largely educational, in order to encourage customers to purchase LEDs instead of other lighting options. Informing customers about available LED instant discounts appears to be a less prominent message used in lighting signage. Among lighting signage pieces reviewed (LED aisle violator; LED shelf talker; and Lighting worksheet tear-off¹⁸), one piece of signage (LED aisle violator) contained information advertising the instant discounts available for LEDs. All three lighting signage pieces contain the Companies' logo.

Messaging on these three different pieces of signage is as follows:

- LED Aisle Violator: Encourages customers to “make the switch and save” and tells customers to “Follow the arrows to instant discounts on ENERGY STAR®-certified bulbs.” This piece of signage also directs customers to the Companies' online bulb finder tool for additional information.
- LED Shelf Talker: Tells customers that “while most LED bulbs offer similar energy savings, there are some differences to look for when purchasing LED light bulbs: bulb life; bulb output.” Messaging also focuses on the fact that ENERGY STAR®-certified LEDs last up to 15 times longer than incandescent bulbs and have light output minimums to ensure customers get enough light.
- Lighting Worksheet Tear-off: This is a 2-page tear-off that customers can take with them, which contains information on several different items, including:
 - Six different bulb types, including A shape, candle, globe, MR16, flood, and spot;

¹⁸ These are the names for different lighting signage pieces developed by Honeywell and sent to the evaluation team for review.

- Brightness of bulbs in lumens;
- Estimated yearly energy cost for a single bulb, based on assumptions of three hours per day and 11 cents/kWh, noting that the yearly energy cost will vary based on usage and rates;
- Energy use comparing different incandescent bulbs to LED bulbs, in wattage; and
- Kelvin Scale.

Lighting retailers reported that they have a variety of signage types but did not specifically discuss all of these three lighting signage pieces. As such, it is unknown if all participating retail stores have all three types of lighting signage pieces in-store.

7.5.2 Lighting Customer Findings – General Population Survey

The evaluation team conducted a general population survey of the Companies customers.¹⁹ The survey attempted to identify customers' purchasing patterns related to program qualifying lighting. Note that the survey only assessed four types of lighting: incandescent, CFL, LED, and halogen.²⁰

The majority of customers appear to be informed and educated regarding LED light bulbs. Nearly 90% of customers report that they have heard of LED bulbs, and 78% of customers report that they would be able to identify an LED bulb.

¹⁹ This was a random digit dial survey of the Companies customers.

²⁰ The survey also assessed appliances, consumer electronics, and HVAC measures.

Figure 7-1. Percent of Customers Who Have Heard of LEDs

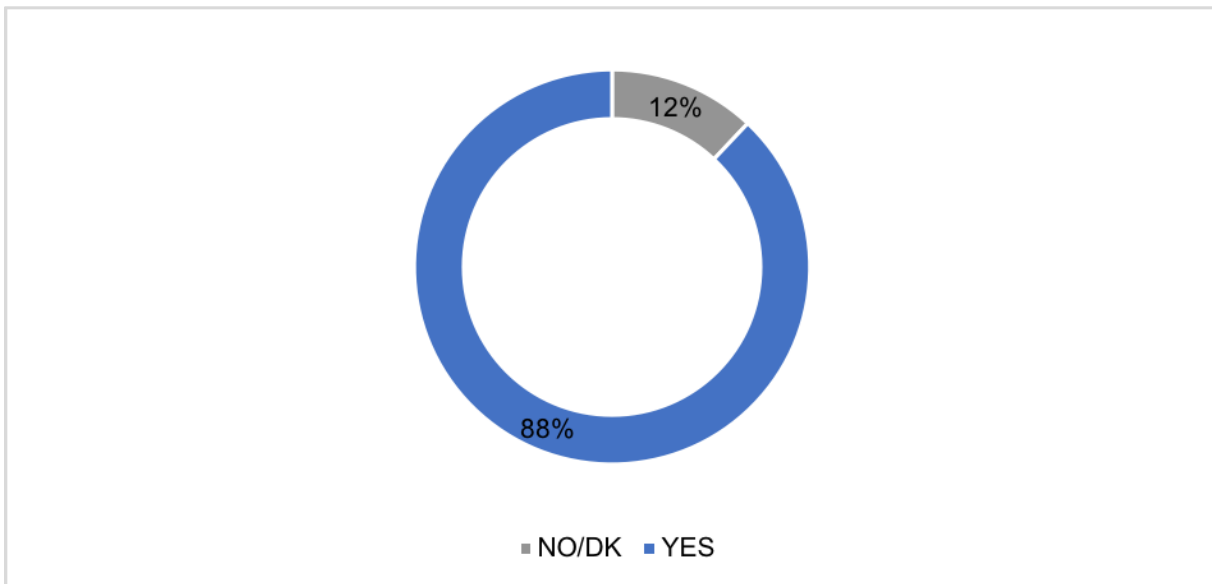
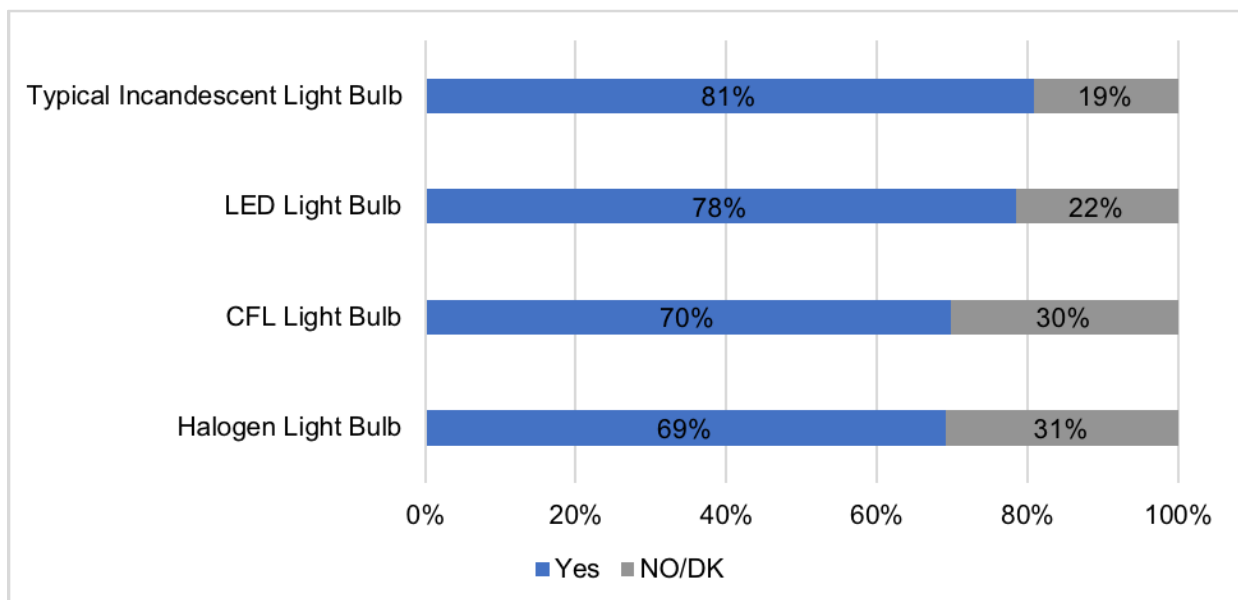


Figure 7-2. Percent of Customers Who Believe They Can Identify Different Bulb Types



Customers report that they purchase a lot of light bulbs and that many of these purchases are done at participating program retailers. Nearly 75% of all customers surveyed reported purchasing light bulbs during 2017. Among these customers, the mean number

of bulbs purchased per customer was 13 bulbs (range 1 bulb - 90 bulbs) and LED bulbs were the most commonly purchased bulb type.

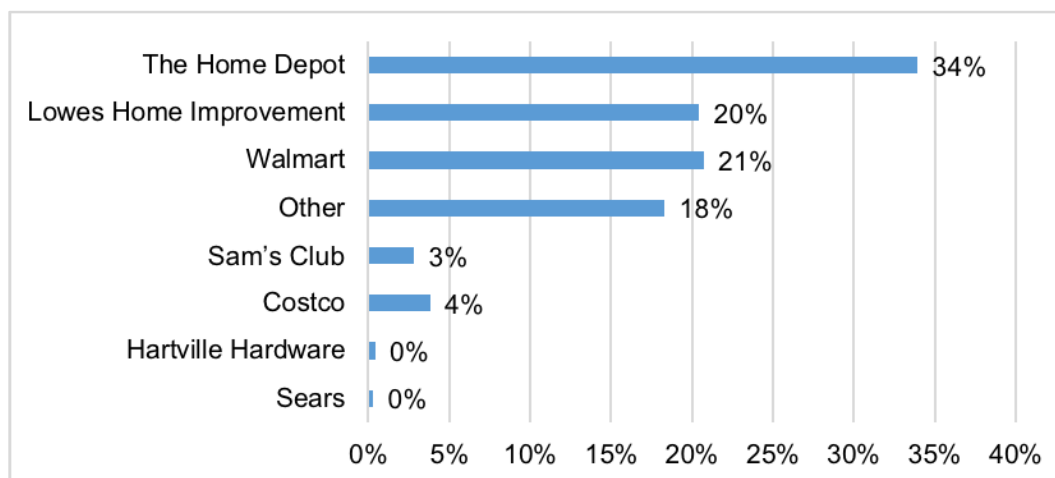
Table 7-8. Bulb Type Purchases

Bulb Type	% Customers Who Purchased Bulbs In 2017	# Customers Who Purchased Bulbs In 2017
LEDs	45%	397
CFLs	26%	229
Halogens	20%	177
LED fixtures	17%	146

Table Note: Denominator = 882 total respondents.

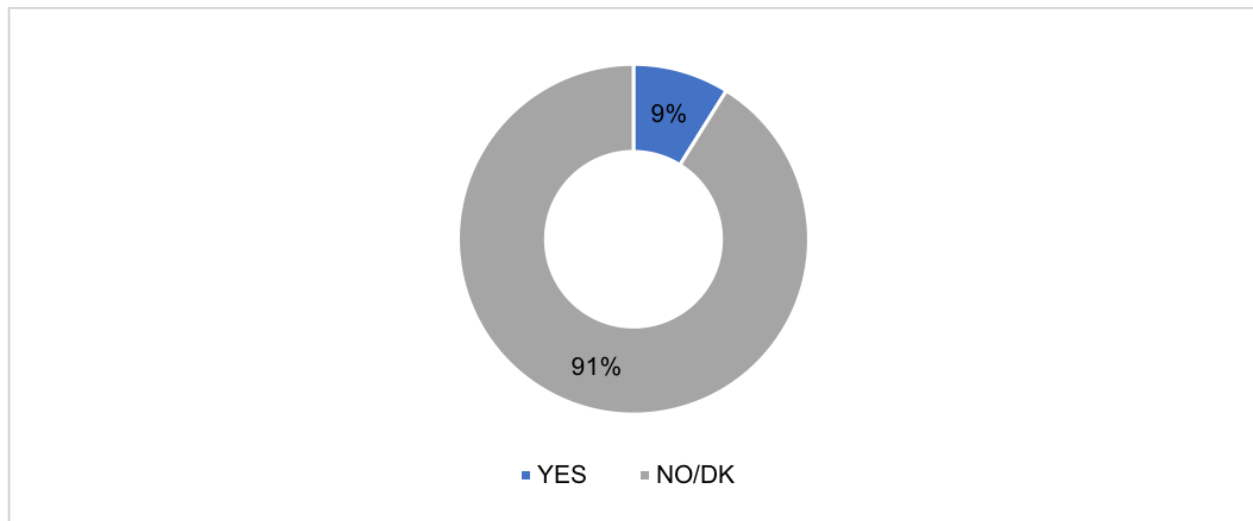
Customers report shopping for bulbs at all retail stores that participate in the Energy Efficient Products Program, including The Home Depot, Walmart, Lowe's Home Improvement Store, Costco, Sam's Club Menard's, and Hartville Hardware. Most frequently, customers shop for bulbs at The Home Depot, followed by Lowe's Home Improvement, and Walmart.

Figure 7-3. Where Customers Purchase Light Bulbs



The majority of customers report that they do not know that their utility provides funds to reduce the price of LED light bulbs purchased at retail stores (91%) or LED fixtures (94%).

Figure 7-4. Awareness that the Utility Sponsors LED Instant Discounts



This finding indicates that the program has an opportunity to improve customer awareness of utility sponsorship of LED discounts if that is a high priority for the program. One way to improve customer awareness regarding utility sponsorship would be to include messaging on signage that focuses on the utility's sponsorship of the LED instant discounts. While all three signage pieces reviewed contain the Companies' logo, none of the signage pieces specifically state that the Companies sponsors LED instant discounts.

Among the 35 customers who reported that they were aware that their utility sponsors provide funds to reduce the price of LEDs at retail stores, customers most frequently learn about discounts from retail store employees (7 of 33) and utility marketing (7 of 33).

Figure 7-5. Source of Customer Awareness of LED Bulb Instant Discounts

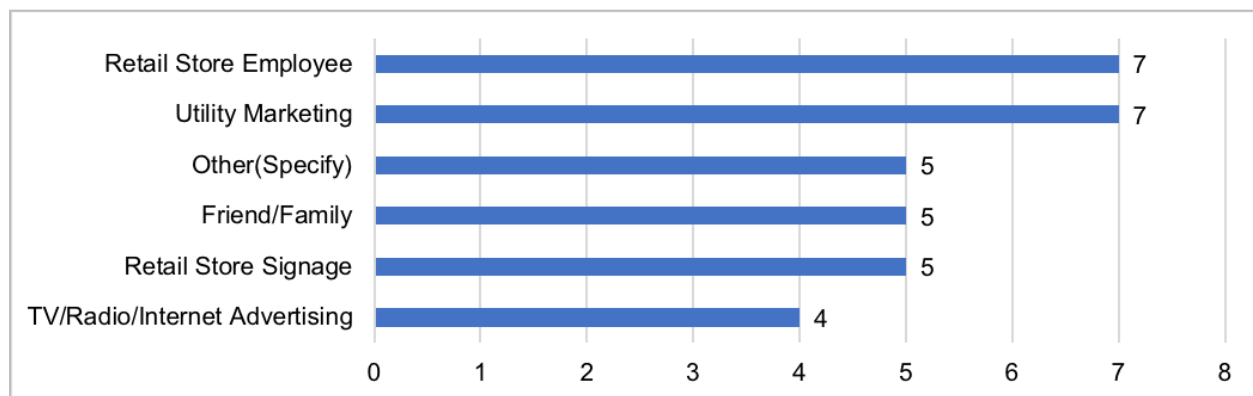
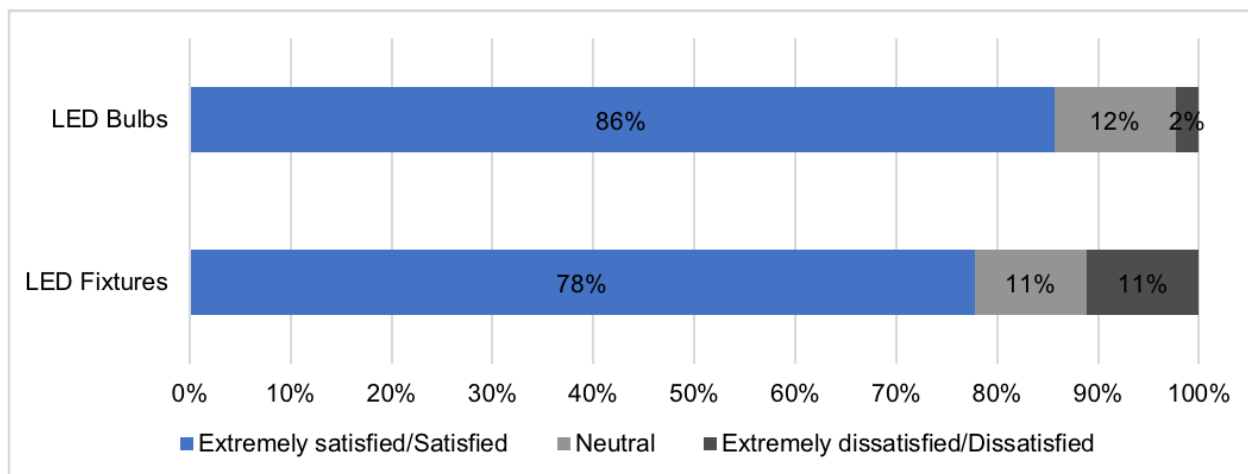


Figure Notes: (1) Table Note: Denominator =35 total respondents. (2) Other includes: newsletter (1); newspaper at work (1); read it somewhere (1); profession (electrician).

Customers who purchased LED bulbs and LED fixtures during 2017 report high levels of satisfaction with their product purchases. Among LED bulb purchasers, 86% report that they are either extremely satisfied or satisfied with their bulb purchases.

Figure 7-6. Customer Satisfaction with LED Purchases



7.5.3 Lighting Customer Findings – Mobile In-Store Survey

A total of 30 customers who completed the mobile survey reviewed lighting products. All customers reviewed LED light bulbs.²¹

Fewer than half of mobile survey respondents saw signage related to the discounts. Among the customers who reviewed lighting products, 13 reported that they saw the Companies' flyers, signs, posters, or stickers advertising rebates or instant discounts, while 16 said that they did not see signs contain this messaging. In addition, eight respondents said that they saw the Companies' signs that specifically advertise long-term energy savings. All respondents were able to easily find the products highlighted in program signage (11)²².

Respondents most commonly review seeing the following types of messages:

- Instant discount (seven);

²¹ LED bulbs included dimmable LED bulbs; indoor/outdoor LED bulbs; 4-packs of LED bulbs; LED bulbs with blue tooth speakers; decorative track lights; and other LED bulb types.

²² 11 respondents reviewed lighting products as their primary product review in the mobile survey. 19 respondents reviewed lighting products as their secondary product review in the mobile survey. This question was only asked during the primary product review survey question battery, so the denominator is 11.

- Saves money and energy over time (six); and
- Durability of the product; bulbs have a long lifespan (five).

Customers generally thought the signage was easy to find (11); informative (15) and easy to understand (14). Ten customers also said the signage was attention-grabbing. Most respondents also report that the signs clearly show which products qualify for instant discounts (11).

It appears the signage has the potential to be influential on customers' purchasing decisions. Half of all lighting mobile survey respondents state that after reviewing the program signage, they are likely or extremely likely to purchase a more efficient option for the product they reviewed (16).²³ Further, nine of the respondents report a high likelihood to purchase the product the next time they are shopping for a similar lighting product.

The below figure provides an example of lighting signage in-store, as seen by a mobile survey respondent. As evidenced, signage emphasizes instant discounts available for LED purchases.

²³ Total is greater than 13 respondents who reported seeing signage related to instant discounts, because respondents were asked this survey question if they said yes to seeing signage of instant discounts or if they said yes to seeing signage related to long-term energy savings.

Figure 7-7. Lighting Signage



Most lighting mobile respondents reported that they did not speak with a sales associate while reviewing their consumer electronic product (nine)²⁴.

²⁴ 11 respondents reviewed lighting products as their primary product review in the mobile survey. 19 respondents reviewed lighting products as their secondary product review in the mobile survey. This question was only asked during the primary product review survey question battery, so the denominator is 11.

8. Conclusions and Recommendations

This chapter reports the conclusions and recommendations resulting from the impact and process evaluation of the 2017 Energy Efficient Products Program.

8.1 Energy and Demand Impact Findings

The number of rebated products in each service territory is detailed in Table 8-1. A total of 108,049 rebates were issued through the Energy Efficient Products program in 2017.

Table 8-1: Qualifying Products Rebated in Each Service Territory

Measure Type	CEI	OE	TE	All Companies
Clothes Washer	804	1,124	303	2,231
Clothes Dryer	299	458	136	893
Refrigerators	579	777	182	1,538
Dehumidifiers	3,962	6,450	814	11,226
Freezers	227	717	85	1,029
Heat Pump Water Heaters	-	14	4	18
LED Fixtures	368	850	140	1,358
LED Bulbs	26,630	46,148	10,447	83,225
LED Bulbs Appliance Turn In	8,088	13,052	2,804	23,944
Televisions	2,102	2,187	656	4,945
Computer	291	242	75	608
Computer Monitor	70	68	13	151
Imaging	362	378	87	827
Total	35,694	59,413	12,942	108,049

Estimated *Ex Post* electric impacts were 66,045,830 kWh saved annually, which represents a realization rate of 87 percent. Average on-peak *Ex Post* demand reduction was estimated to be 8,153 kW annually, which represents a realization rate of 87 percent. For detailed tables listing energy savings and demand reductions by measure type, please refer to Appendix A. The realization rates by appliance type, the estimates of

annual gross energy savings (kWh) and on-peak demand reductions (kW) for the program in the three Companies are reported in Table 8-2 and Table 8-3 below.

Table 8-2: Overall Gross kWh and kW Savings per EDC

EDC	Ex Ante Expected Savings		Ex Post Verified Savings		Realization Rates	
	kWh	kW	kWh	kW	kWh	kW
CEI	29,353,361	3,614.71	25,787,141	3,171.09	88%	88%
OE	37,712,531	4,691.23	33,114,301	4,110.36	88%	88%
TE	10,556,234	1,284.04	9,212,932	1,119.31	87%	87%
Total	77,622,126	9,589.97	68,114,375	8,400.76	88%	88%

Table 8-3: Overall Gross kWh and kW Savings by Sub-program

Sub Program	Ex Ante Expected Savings		Ex Post Verified Savings		Realization Rates	
	kWh	kW	kWh	kW	kWh	kW
Appliances	3,689,536	770.84	3,708,456	715.93	100.51%	92.88%
Consumer Electronics	1,487,368	155.80	1,527,764	171.04	102.72%	109.78%
Lighting	72,445,222	8,663.33	62,878,154	7,513.79	86.79%	86.73%
Total	77,622,126	9,589.97	68,114,375	8,400.76	87.75%	87.60%

8.2 Low Income Participation

The Companies expanded their evaluation, measurement and verification effort to identify participation and savings from low income customers in the residential programs. A “low income” customer was defined by household income below 150% of Federal Poverty Level.

Table 8-4 shows the quantity of units, kWh, and kW that can be attributed to low income population participant in the EE Products program.

Table 8-4 : Savings Attributable to Low Income Customers

Energy Efficient Products	Percentage of Low Income Purchasers	Quantity	kWh Savings	kW Savings
CEI	12.8%	4,557	3,202,887	394.17
OE	14.1%	8,382	4,517,964	561.51
TE	13.5%	1,744	1,203,664	146.31
Total	13.6%	14,654	8,957,589	1,105.84

8.3 Process Findings

The following sections detail process evaluation conclusions related to program operations, retailer feedback, and customer research.

8.3.1 Program Operations Conclusions

The following section summarizes the conclusions related to program operations, signage, and performance.

- Honeywell is responsible for implementing the Energy Efficient Products Program, including recruiting retail partners to participate in the retail network; providing signage and sales associate training to retail partners; and processing customer rebates for downstream measures. Honeywell reports that they have experienced some level of difficulty in recruiting retailers for the midstream product offerings, including heat pump water heaters, freezers, dehumidifiers, and consumer electronics product offerings
- The retailer network is a critical outreach strategy for the program; most customer outreach is done directly by retailers who participate in the network. Retail stores put up program signage to increase customer awareness about qualifying products, and retail sales associates sell qualifying products.
- Signage is critical for program operations but does not replace the interactions with retailers. Retailers report that program signage increases customer awareness about the program and qualifying products, but that retail sales staff are critical for closing the deal. They note that sales staff are responsible for educating customers, driving the sale, and promoting the purchase of qualifying products.
- Interviews with program staff revealed the difficulty in recruiting retailers to engage in heat pump water heater sales, confirmed by the few heat pump water heaters rebated (18). However, interviews with program staff did not reveal any issues with program implementation and felt that incentives and retail partners were sufficient to engage participation.

8.3.2 Retailer Feedback Conclusions

The following section summarizes the key findings from the retailer interviews.

- Overall, retailers are very satisfied with the program and report numerous benefits to participating in the retailer network, including being able to provide rebates and incentives and high efficiency, high-quality products to their customers, thus improving customer service. Retailers also report benefits related to improving store sales and revenue.
- Retailers report that they primarily receive information about the program when staff visits their retail stores. More than half of retailers are satisfied with this level of communication; however, a subset (5 of 22) report that they would like either more frequent in-store or phone interactions or would like to know who to call if questions arise. The Companies reported that they provide retailers with program contact information at the beginning of the program year and intermittently throughout the year.
- Smaller independent store owners expressed frustration with not knowing how to participate in the program earlier on. These retailers discussed how they would have liked information about the program earlier on so that they could have started participating earlier. The Companies reported that they contact independent retailers as they are identified.
- Retailers are often unsure or unaware of which equipment qualifies for the program and expressed interest in receiving additional training opportunities and program communications regarding qualifying products. In fact, when speaking with retailers, some suggested including equipment that is already part of the program, indicating they are unsure of what equipment and products qualify within the program. They would like this additional communication so that they feel more knowledgeable talking to customers about qualifying products. The Companies reported that they update stores regularly regarding qualifying equipment and products.

■

8.3.3 Customer Research Conclusions

The following section provides key findings based on the customer research.

- Most customers learn about the program from their retailer or utility mailing, indicating that the primary sources of information used in the program are effective in increasing customer awareness. However, these sources do not appear to translate into motivating customers to make purchases. Customers reported that product features and aesthetics are a primary motivator, especially for refrigerators.
- Downstream incentive recipients surveyed voiced exceptionally high satisfaction with the program with 92% saying they are satisfied with the program overall. A similar percentage voiced satisfaction with the amount of time it took to receive the rebate as well as the rebate value itself.
- While all program signage includes the Companies logo as the program sponsor, the majority of customers do not know that the Companies provide funds to reduce the price of their purchase, whether for appliances, consumer electronics, or lighting.
- General awareness of LED bulbs among customers is high. Nearly 90% of customers report that they have heard of LED bulbs.
- Most customers surveyed as part of the general population survey that reported purchasing a refrigerator, freezer, or dehumidifier in the prior year said that purchase was ENERGY STAR®-qualified (85%, 78%, and 77%, respectively).
- Three-quarters of the mobile survey respondents that elected to review appliances reported seeing product-related signage. Less than half of the mobile survey respondents that elected to review lighting products reported seeing product-related signage. Mobile survey respondents that reported seeing signage believed the information was easy to understand and influential. Few respondents provided suggestions for signage improvements.
- Many mobile survey respondents reported that retail staff associates did not discuss their product options with them. Among those who did interact with sales associates, discussions focused on energy savings, as well as cost savings. Additionally, very few customers were referred to the energysave-ohio-home.com website for additional information about the program and qualifying products.
- Based upon their review of program signage, approximately half of mobile survey respondents report that they are likely to purchase a more efficient option the next time they are shopping for an appliance, consumer electronic, or lighting product.

8.4 Recommendations

The evaluation team offers the following recommendations for continued improvement of the Residential Energy Efficient Products Program.

- The Companies should consider identifying additional opportunities to train and educate retail staff. The Companies and their implementation contractor should work with the individual retail stores to identify the optimal way to provide information to educate retail staff on qualifying products and the Companies' rebates and incentives. Additionally, per interviews, there would be value for Honeywell or the Companies' staff to visit retailers more frequently and offer ad-hoc or refresher training and information to retail staff, in addition to formal training opportunities.
- The Companies should consider identifying opportunities to enhance communications with retail stores and retail sales associates. Communications from the program must make their way to sales associates who are on the floor selling products.
- The Companies should consider identifying additional ways to engage smaller, independent retailers who want to participate, but were frustrated by not knowing about the program earlier. The Companies could consider offering retailer program information on the program website. This information could include retailer participation requirements and instructions for program enrollment.
- The program could identify strategies to improve customer awareness of utility sponsorship if this is a high priority for the program. Messaging could focus on the Companies' role in sponsoring the discounts, instead of simply including the Companies' logo.

9. Appendix A: Required Savings Tables

Tables showing measure-level participation counts and savings for the 2017 Energy Efficient Products Program were provided in various locations throughout this report. This appendix provides additional tables summarizing savings results.

- Table 9-1 reports the annual *ex post* kWh savings by EDC and measure.
- Table 9-2 reports the average annual *ex post* on-peak kW reductions by EDC and measure.
- Table 9-3 reports the lifetime *ex post* kWh savings by EDC and measure.

Table 9-1: Annual Ex Post Energy Savings (kWh)

Measure Type	CEI	OE	TE	All Companies
Clothes Washer	169,042	236,131	64,120	469,293
Clothes Dryer	8,171	12,540	3,708	24,419
Refrigerators	68,990	93,009	21,358	183,357
Dehumidifiers	1,015,731	1,640,108	208,715	2,864,554
Freezers	30,099	95,071	11,271	136,442
Heat Pump Water Heaters	0	23,638	6,754	30,392
LED Fixtures	107,833	144,703	66,023	318,559
LED Bulbs	22,963,952	29,144,872	8,382,227	60,491,051
LED Bulbs Appliance Turn In	697,859	1,089,292	281,393	2,068,544
Televisions	584,889	499,573	130,882	1,215,344
Computer	90,321	93,296	22,967	206,584
Computer Monitor	6,048	5,136	2,448	13,632
Imaging	44,206	36,931	11,067	92,204
Total	25,787,141	33,114,301	9,212,932	68,114,375

Table 9-2: Annual Ex Post On-Peak Demand Reductions (kW)

Measure Type	CEI	OE	TE	All Companies
Clothes Washer	17.43	24.35	6.61	48.40
Clothes Dryer	1.44	2.22	0.66	4.32
Refrigerators	12.08	16.29	3.74	32.11
Dehumidifiers	213.60	345.93	43.53	603.07
Freezers	5.27	16.65	1.97	23.89
Heat Pump Water Heaters	0.00	3.23	0.92	4.15
LED Fixtures	12.89	17.29	7.89	38.07
LED Bulbs	2,744.14	3,482.74	1,001.66	7,228.54
LED Bulbs Appliance Turn In	83.39	130.17	33.63	247.19
Televisions	53.73	45.91	12.03	111.67
Computer	12.22	12.62	3.11	27.95
Computer Monitor	0.81	0.68	0.33	1.82
Imaging	14.09	12.27	3.24	29.60
Total	3,171.09	4,110.36	1,119.31	8,400.76

Table 9-3: Lifetime Ex Post Energy Savings (kWh)

Measure Type	CEI	OE	TE	All Companies
Clothes Washer	1,859,462	2,597,441	705,320	5,162,223
Clothes Dryer	106,222	163,026	48,201	317,449
Refrigerators	965,860	1,302,126	299,012	2,566,998
Dehumidifiers	12,188,772	19,681,293	2,504,578	34,374,644
Freezers	421,391	1,331,001	157,790	1,910,181
Heat Pump Water Heaters	-	236,382	67,538	303,920
LED Fixtures	1,509,664	2,025,841	924,319	4,459,824
LED Bulbs	344,459,278	437,173,085	125,733,409	907,365,772
LED Bulbs ATI	10,467,888	16,339,381	4,220,893	31,028,162
Televisions	3,509,334	2,997,438	785,292	7,292,064
Computer	361,284	373,184	91,868	826,336
Computer Monitor	24,192	20,544	9,792	54,528
Imaging	265,236	221,587	66,400	553,223
Total	376,138,583	484,462,329	135,614,412	996,215,324

10. Appendix B: Survey Instruments

January 19, 2017, | **MOBILE IN-STORE CUSTOMER SURVEY**

TO: ADM & FIRSTENERGY FROM: ILLUME ADVISING

As part of the FirstEnergy Energy Efficient Products Program process evaluation, ILLUME Advising is conducting a mobile in-store customer survey. This memo outlines the research goals, study design, and timeline for the mobile in-store surveys. The draft survey instrument appears at the end of this memo.

RESEARCH GOALS

The mobile in-store customer survey will assess the in-store customer experience. Specifically, the survey will capture information related to customer response to program signage; customer experience with sales associates; and whether program information obtained during the in-store experience may motivate customers to purchase qualifying products. In addition, the survey will capture information related to the effectiveness of product placement within the store and customers' overall in-store experience.

Table 1, below, details the specific questions related to these objectives.

TABLE 1. KEY RESEARCH AREAS AND QUESTIONS FOR MOBILE IN-STORE CUSTOMER SURVEYS.

TOPIC	RESEARCH QUESTIONS
Customer experience with program signage	1. Is program signage effectively placed?
	2. How do customers perceive program signage? What do customers believe are the goals of the signage?
	3. Do customers perceive signage to be useful and informative?
	4. How effective is program signage at increasing customer awareness of program-qualifying high efficiency options over lower efficiency options?
	5. Does program signage provide clear, easily understandable information?
	6. Does program signage clearly show the program sponsor (FirstEnergy: Ohio Edison, The Illuminating Company, Toledo Edison)?
	7. Does program signage raise additional questions for customers; and if yes, what are these questions?

TOPIC	RESEARCH QUESTIONS
Interactions with sales associates	<ol style="list-style-type: none"> 1. Did customers speak with a sales associate? 2. Do sales associates discuss qualifying products and (for downstream measures) rebates with customers? 3. Do customers perceive sales associates to be knowledgeable in discussing qualifying products and (for downstream measures) rebates?
Motivations and decision to purchase	<ol style="list-style-type: none"> 1. How effective is program signage in motivating customers to want to purchase qualifying equipment over non-qualifying equipment? 2. [For those that speak with a sales representative] How effective is information provided by sales representatives in motivating customers to want to purchase qualifying equipment over non-qualifying equipment? 3. [For downstream measures] Would rebate levels be sufficient to influence customer decision to purchase qualifying equipment over non-qualifying equipment?
Program products and product placement	<ol style="list-style-type: none"> 1. Were all advertised items in stock? 2. Where are program qualified equipment placed within store, and is equipment in easily-viewed areas? 3. [For lighting] Do respondents understand which bulb they need to purchase based on the information and lumens?
Overall satisfaction	<ol style="list-style-type: none"> 1. How satisfied are customers with their shopping experience? 2. Where are opportunities to improve the shopping experience?

STUDY DESIGN

The surveys will be completed by panel members on their mobile devices while in-store.

This evaluation will partner with a market research firm who maintains mobile customer panels within all states across the country. The mobile customer panel is made up of individuals who have already agreed to participate in research.

To select survey customers from the panel, Geo-fencing will be set up around specific participating retail locations. Once anyone from the previously recruited customer panel enters the specified retail location parking lots, the firm sends the customer a text message letting them know an in-store experience survey is available and where they should visit to complete the in-store experience survey. From there the customer panel member is able to answer questions specific to their experience and upload pictures for the record. Table 2, below, depicts the retail locations that will be geo-fenced as part of this study, in addition to which sub-programs (Appliances, Consumer Electronics, and Lighting) each of the retailers participate in.

The retail locations (excluding Costco locations) identified in Table 2 were selected from a list of 69 participating retail locations provided by the program implementer, Honeywell. Our team elected to use this list (instead of the program data detailing all participating retailers), as we are targeting these 69 participating retail locations for retailer interviews. Retailer interviews were not conducted with Costco; however, FirstEnergy would like Costco included in the mobile in-store customer survey. A total of six Costco locations are present in the program tracking data. All of these are included in this survey. Conducting retailer interviews and mobile in-store customer surveys at some the same retail locations will allow our team to triangulate evaluation findings. It should be noted that a total of 22 retailer in-depth interviews are being conducted. The evaluation team aims to have some representation of the mobile in-store customer surveys among retail locations that also participate in the retailer in-depth interviews.

Among the 69 participating retail locations initially identified, our team removed any stores that are not considered “big box” retail locations. Smaller and independent stores are typically not well-suited to this type of mobile in-store customer survey. The remaining retail locations include Best Buy, Home Depot, JCPenney, Lowe’s, Menard’s, Sam’s Club, Sears, and Walmart.

For retail locations that only participate in one sub-program, mobile panel members will be asked questions related to that one sub-program only. For retail locations that participate in more than one sub-program, mobile panel members will first be asked questions related to one sub-program. If customers are willing, they will then be asked to answer questions about program signage for an additional sub-program. The unique retail locations with sub-programs are detailed in Table 4. The primary sub-program (detailed in Table 4, column 3) was determined based on priority areas for this survey, including the Consumer Electronics sub-program and midstream Appliances. Consumer Electronics was prioritized first due to lower participation and implementer-identified challenges for this sub-program. Midstream Appliances was prioritized secondarily.

Downstream appliances and lighting sub-programs are prioritized last, due to higher participation and fewer implementation challenges with these sub-programs. For example, any retail locations that participate in the Consumer Electronics program will have survey questions focused on that sub-program first. If retail locations also participate in other sub-programs, customers will then be asked if they are willing to answer additional questions that relate to this secondary sub-program.

We are aiming for a total of 50 survey completes.

TABLE 2. RETAIL LOCATIONS AND SUB-PROGRAM PARTICIPATION.

RETAILER	LOCATIONS	SUB-PROGRAM PARTICIPATION
Best Buy	Perrysburg, Mayfield Heights, Avon, Brooklyn, Mentor, Fairlawn	Appliances (downstream and midstream); Consumer Electronics ²⁵
Home Depot	Wadsworth, Warren, Macedonia, Elyria, Akron, Medina, Ashland, Lorain, Aurora, Chardon, Maple Heights	Appliances (downstream and midstream); Lighting ²⁶
JCPenney	Mentor, Niles, Fairlawn	Appliances (downstream only) ²⁷
Lowe's	Mount Vernon, Wadsworth, Marysville, Youngstown, Elyria, Defiance, Fairview Park, Kent, Avon, Lorain	Appliances (downstream and midstream); Lighting ²⁸

²⁵ All six Best Buy locations participate in both the downstream and midstream Appliances program and the Consumer Electronics program.

²⁶ Home Depot locations in Macedonia, Elyria, Akron, Medina, Aurora, Chardon, and Maple Heights participate in both the downstream and midstream Appliances program and the Lighting program. Home Depot locations in Ashland, Wadsworth, and Warren participate in the downstream Appliances program only. The Home Depot in Lorain participates in the downstream and midstream Appliances program only.

²⁷ All three JCPenney locations participate in the downstream Appliances program only.

²⁸ Lowe's locations in Mount Vernon, Wadsworth, and Marysville participate in the downstream Appliances program only. All other Lowe's locations participate in both the downstream and midstream Appliances program and the Lighting program.

RETAILER	LOCATIONS	SUB-PROGRAM PARTICIPATION
Menard's	Marion, Oregon, Massillon	Appliances (downstream); Lighting ²⁹
Sam's Club	Mentor, Sandusky, Mansfield, Holland	Appliances (downstream); Lighting ³⁰
Sears	Streetsboro, Springfield, Madison, Parma, Mount Vernon, Strongsville, Youngstown, North Olmstead	Appliances (downstream and midstream) ³¹
Walmart	Ashland, Mansfield, Mentor, Eastlake	Lighting ³²
Costco	Toledo, Perrysburg, Boston Heights, Avon, Mayfield Heights, Strongsville	Lighting

Once a mobile panel member agrees to participate in the survey, they will then be directed to enter the retail store look for specific products within the store. For lighting, respondents will be asked to look for “led light bulbs or fixtures.” For consumer electronics, respondents will be asked to look for “televisions, computers and computer monitors, or printers and scanners.” FOR DOWNSTREAM APPLIANCES, RESPONDENTS WILL BE ASKED TO LOOK FOR “REFRIGERATORS, CLOTHES WASHERS AND DRYERS” FOR MIDSTREAM APPLIANCES, RESPONDENTS WILL

²⁹ All three Menard's locations participate in both the downstream Appliances program and the Lighting program.

³⁰ All four Sam's Club locations participate in both the downstream Appliances program and the Lighting program.

³¹ Sears locations in Streetsboro, Springfield, Madison, Parma, Mount Vernon participate in the downstream Appliances program only. Sears locations in Strongsville, Youngstown, and North Olmstead participate in both the downstream and midstream Appliances programs.

³² All four Walmart locations participate in the Lighting program.

BE ASKED TO LOOK FOR “FREEZERS, DEHUMIDIFIERS, OR HEAT PUMP WATER HEATERS.” Respondents will then be asked to complete the 8-10 minute survey.

We are aiming for a larger proportion of survey completes representing the Appliances and Consumer Electronics sub-programs. Table 3 depicts the quota minimums by sub-program.

TABLE 3. QUOTA MINIMUMS BY SUB-PROGRAM.³³

SUB-PROGRAM	QUOTA MINIMUMS
Appliances (downstream and midstream)	15
Consumer Electronics	15
Lighting	10

Timeline

Upon survey approval by FirstEnergy, our team will then move to survey programming. We are assuming that the final survey will be approved by FirstEnergy by January 12. Programming and QA/QC testing of the programmed survey is scheduled for January 15-19. The mobile in-store surveys will be fielded from January 22 through February 2, 2018.

Survey Guide

The purpose of this section is to provide a draft of the mobile in-store customer survey instrument.

Introduction

NOTE TO PROGRAMMER: THE FOLLOWING TEXT SHOULD BE SENT TO MOBILE PANEL PARTICIPANTS WHO ENTER GEO-FENCED RETAIL LOCATIONS. CUSTOMERS SHOULD BE PINGED ON THEIR PHONES IMMEDIATELY UPON ENTERING GEO-FENCED RETAIL PARKING LOT LOCATIONS. UPON AGREEING TO PARTICIPATE, CUSTOMERS WILL THEN BE DIRECTED TO SPECIFIC AREAS OF THE STORE.

³³ The quotas in Table 3 are minimums. The evaluation team aims to complete a total of 50 mobile in-store customer surveys, meeting quota minimums in each of the three sub-programs.

You have been selected to participate in a brief research study related to your experiences visiting [FILL RETAIL LOCATION]. If you agree to participate in this survey, we will ask that you look for specific products in [FILL RETAIL LOCATION] and provide feedback on those products. This survey should take approximately 8-10 minutes.

NOTE TO PROGRAMMER: [FILL RETAIL LOCATION] WITH UNIQUE RETAIL LOCATIONS, IN TABLE 4, COLUMN 1, BELOW.

A. SCREENER

A1. Are you willing to participate in this survey?

- 1. Yes
- 2. No [Terminate]
- 97. [Other][Specify] [Terminate]
- 98. [Not Sure] [Terminate]
- 99. [Refused] [Terminate]

A2. Why did you come to [RETAIL LOCATION] today? [NOTE TO PROGRAMMER: FILL BASED ON RETAIL LOCATION IN TABLE 4, COLUMN 1] [ROTATE]

- 1. To shop for a refrigerator, clothes washer, clothes dryer, or water heater
- 2. To shop for a freezer, dehumidifier, or heat pump water heater
- 3. To shop for televisions, computers, monitors, printers or scanners
- 4. To shop for LED light bulbs and lighting fixtures
- 97. [Other][Specify]
- 98. [Not Sure]
- 99. [Refused]

B. CUSTOMER EXPERIENCE WITH PROGRAM SIGNAGE

NOTE TO PROGRAMMER: [SUB-PROGRAM] BELOW SHOULD BE FILLED WITH LIGHTING, APPLIANCES, OR CONSUMER ELECTRONICS BASED UPON TABLE 4. FILL [SUB-PROGRAM] WITH TEXT IN TABLE 4 COLUMN 3, "SUB-PROGRAM FILL FOR PROGRAMMING – PRIMARY." FOR APPLIANCES, TABLE 4, COLUMN 3 DENOTES WHETHER THE APPLIANCES ARE MIDSTREAM OR DOWNSTREAM. CREATE FLAG TO NOTE THIS. DO NOT INCLUDE "DOWNSTREAM" OR "MIDSTREAM" WHEN DIRECTING RESPONDENTS TO "APPLIANCES".

Please proceed to the [SUB-PROGRAM] section of the store.

TABLE 4. PROGRAMMING FILLS BY UNIQUE RETAIL LOCATION.

UNIQUE RETAIL LOCATION	SUB-PROGRAM PARTICIPATION	SUB-PROGRAM FILL FOR PROGRAMMING - PRIMARY	SUB-PROGRAM FILL FOR PROGRAMMING - SECONDARY
Best Buy - Perrysburg	Appliances (downstream and midstream); Consumer Electronics	Consumer Electronics	Appliances (midstream)
Best Buy – Mayfield Heights	Appliances (downstream and midstream); Consumer Electronics	Consumer Electronics	Appliances (downstream)
Best Buy – Avon	Appliances (downstream and midstream); Consumer Electronics	Consumer Electronics	Appliances (midstream)
Best Buy - Brooklyn	Appliances (downstream and midstream); Consumer Electronics	Consumer Electronics	Appliances (downstream)
Best Buy - Mentor	Appliances (downstream and midstream); Consumer Electronics	Consumer Electronics	Appliances (midstream)
Best Buy - Fairlawn	Appliances (downstream and midstream); Consumer Electronics	Consumer Electronics	Appliances (downstream)
Home Depot – Wadsworth	Downstream Appliances program only	Appliances (downstream)	None
Home Depot – Warren	Downstream Appliances program only	Appliances (downstream)	None

UNIQUE RETAIL LOCATION	SUB-PROGRAM PARTICIPATION	SUB-PROGRAM FILL FOR PROGRAMMING - PRIMARY	SUB-PROGRAM FILL FOR PROGRAMMING - SECONDARY
Home Depot – Macedonia	Downstream and midstream Appliances program and the Lighting program	Appliances (midstream)	Lighting
Home Depot – Elyria	Downstream and midstream Appliances program and the Lighting program	Appliances (midstream)	Lighting
Home Depot – Akron	Downstream and midstream Appliances program and the Lighting program	Appliances (midstream)	Lighting
Home Depot – Medina	Downstream and midstream Appliances program and the Lighting program	Appliances (midstream)	Lighting
Home Depot – Ashland	Downstream Appliances program only	Appliances (downstream)	None
Home Depot – Lorain	Downstream and midstream Appliances program only	Appliances (midstream)	Appliances (downstream)
Home Depot – Aurora	Downstream and midstream Appliances program and the Lighting program	Appliances (midstream)	Lighting

UNIQUE RETAIL LOCATION	SUB-PROGRAM PARTICIPATION	SUB-PROGRAM FILL FOR PROGRAMMING - PRIMARY	SUB-PROGRAM FILL FOR PROGRAMMING - SECONDARY
Home Depot – Chardon	Downstream and midstream Appliances program and the Lighting program	Appliances (midstream)	Lighting
Home Depot – Maple Heights	Downstream and midstream Appliances program and the Lighting program	Appliances (midstream)	Lighting
JCPenney – Mentor	Downstream appliances only	Appliances (downstream)	None
JCPenney - Niles	Downstream appliances only	Appliances (downstream)	None
JCPenney - Fairlawn	Downstream appliances only	Appliances (downstream)	None
Lowe’s – Mount Vernon	Downstream Appliances program only	Appliances (downstream)	None
Lowe’s – Wadsworth	Downstream Appliances program only	Appliances (downstream)	None
Lowe’s – Marysville	Downstream Appliances program only	Appliances (downstream)	None
Lowe’s – Youngstown	Appliances (downstream and midstream); Lighting	Appliances (midstream)	Lighting

UNIQUE RETAIL LOCATION	SUB-PROGRAM PARTICIPATION	SUB-PROGRAM FILL FOR PROGRAMMING - PRIMARY	SUB-PROGRAM FILL FOR PROGRAMMING - SECONDARY
Lowe's - Elyria	Appliances (downstream and midstream); Lighting	Appliances (midstream)	Lighting
Lowe's – Defiance	Appliances (downstream and midstream); Lighting	Appliances (midstream)	Lighting
Lowe's – Fairview Park	Appliances (downstream and midstream); Lighting	Appliances (midstream)	Lighting
Lowe's – Kent	Appliances (downstream and midstream); Lighting	Appliances (midstream)	Lighting
Lowe's - Avon	Appliances (downstream and midstream); Lighting	Appliances (midstream)	Lighting
Lowe's - Lorain	Appliances (downstream and midstream); Lighting	Appliances (midstream)	Lighting
Menard's – Marion	Appliances (downstream)	Appliances (downstream)	None
Menard's – Oregon	Appliances (downstream); Lighting	Appliances (downstream)	Lighting
Menard's - Massillon	Appliances (downstream); Lighting	Lighting	Appliances (downstream)
Sam's Club – Mentor	Appliances (downstream); Lighting	Appliances (downstream)	Lighting

UNIQUE RETAIL LOCATION	SUB-PROGRAM PARTICIPATION	SUB-PROGRAM FILL FOR PROGRAMMING - PRIMARY	SUB-PROGRAM FILL FOR PROGRAMMING - SECONDARY
Sam's Club - Sandusky	Appliances (downstream); Lighting	Lighting	Appliances (downstream)
Sam's Club - Mansfield	Appliances (downstream); Lighting	Appliances (downstream)	Lighting
Sam's Club - Holland	Appliances (downstream); Lighting	Lighting	Appliances (downstream)
Sears – Streetsboro	Downstream Appliances program only.	Appliances (downstream)	None
Sears – Springfield	Downstream Appliances program only	Appliances (downstream)	None
Sears – Madison	Downstream Appliances program only	Appliances (downstream)	None
Sears – Parma	Downstream Appliances program only	Appliances (downstream)	None
Sears – Mount Vernon	Downstream Appliances program only	Appliances (downstream)	None
Sears – Strongsville	Downstream and midstream appliances only	Appliances (downstream)	Appliances (midstream)

UNIQUE RETAIL LOCATION	SUB-PROGRAM PARTICIPATION	SUB-PROGRAM FILL FOR PROGRAMMING - PRIMARY	SUB-PROGRAM FILL FOR PROGRAMMING - SECONDARY
Sears - Youngstown	Downstream and midstream appliances only	Appliances (midstream)	Appliances (downstream)
Sears – North Olmstead	Downstream and midstream appliances only	Appliances (downstream)	Appliances (midstream)
Walmart- Ashland	Lighting	Lighting	None
Walmart – Mansfield	Lighting	Lighting	None
Walmart – Mentor	Lighting	Lighting	None
Walmart - Eastlake	Lighting	Lighting	None

Once you have arrived at the [SUB-PROGRAM] section of the store, please look for [FILL PER PROGRAMMING NOTE BELOW.]

FOR [LIGHTING], FILL, “PLEASE LOOK FOR LED LIGHT BULBS OR FIXTURES.” FOR [CONSUMER ELECTRONICS], FILL, “PLEASE LOOK FOR TELEVISIONS, COMPUTERS, MONITORS, PRINTERS, OR SCANNERS.”

NOTE TO PROGRAMMER: [APPLIANCES] SUB-PROGRAM FILL DEPICTED IN TABLE 4, COLUMN 3 INCLUDES 2 DIFFERENT APPLIANCE STREAMS – DOWNSTREAM AND MIDSTREAM. FOR DOWNSTREAM APPLIANCES, FILL, “PLEASE LOOK FOR REFRIGERATORS, CLOTHES WASHERS AND DRYERS, OR WATER WATERS.” FOR MIDSTREAM APPLIANCES, FILL, “PLEASE LOOK FOR FREEZERS, DEHUMIDIFIERS, OR HEAT PUMP WATER HEATERS.”

Please take a few minutes to select one item, either [FOR [LIGHTING], FILL, “LED LIGHT BULBS OR FIXTURES.” FOR [CONSUMER ELECTRONICS], FILL, “TELEVISIONS,

COMPUTERS AND COMPUTER MONITORS, OR PRINTERS AND SCANNERS.”. FOR DOWNSTREAM APPLIANCES, FILL, “REFRIGERATORS, CLOTHES WASHERS AND DRYERS, OR WATER WATERS.” FOR MIDSTREAM APPLIANCES, FILL, “FREEZERS, DEHUMIDIFIERS, OR HEAT PUMP WATER HEATERS.” Once you have selected one type of product, please familiarize yourself with the surroundings around this product. Once you are done, hit next, and we will ask you some questions.

[PROGRAMMING NOTE: INCLUDE ‘NEXT’ BUTTON THAT RESPONDENTS MUST HIT TO PROCEED.]

B1. What product did you select to review today?

[OPEN END]

98. [Not Sure]

99. [Refused]

[ASK B2 ONLY IF [SUB-PROGRAM FILL] = LIGHTING OR APPLIANCES (DOWNSTREAM). ASK B3 ONLY IF [SUB-PROGRAM FILL] = CONSUMER ELECTRONICS OR APPLIANCES (MIDSTREAM).

B2. Do you see any flyers, signs, posters, or stickers advertising rebates or instant discounts offered by one of FirstEnergy’s utilities: Ohio Edison, The Illuminating Company, Toledo Edison [SUB-PROGRAM]?

1. Yes

2. No

97. [Other][Specify]

98. [Not Sure]

99. [Refused]

B3. Do you see any FirstEnergy utility (Ohio Edison, The Illuminating Company, Toledo Edison) branded flyers, signs, posters, or stickers advertising the long-term energy savings if you purchase the appliance type you are reviewing?

1. Yes

2. No

97. [Other][Specify]

98. [Not Sure]

99. [Refused]

[IF B2 OR B3=1, PROCEED TO B4.]

[IF B2 OR B3=2, 97, 98 OR 99, SKIP TO SECTION C: INTERACTIONS WITH SALES ASSOCIATES.]

B4. What is the most prominent message in the information you see?

[OPEN END RESPONSE]

B5. How much do you agree or disagree with each of the following statements?
[ROTATE]

[NOTE: ONLY ASK B5.F IF [SUB-PROGRAM]=APPLIANCES (DOWNSTREAM) OR LIGHTING. DO NOT ASK B5.F IF [SUB-PROGRAM]=CONSUMER ELECTRONICS OR APPLIANCES (MIDSTREAM).]

	Completely disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Completely agree
	1	2	3	4	5
a. The signs were easy to find.					
b. The signs are attention-grabbing.					
c. The signs are easy to understand.					
d. The signs are informative.					
e. The signs clearly show which products qualify for rebates and/or instant discounts.					

B6. What do you believe the signs are encouraging you to do? [OPEN END RESPONSE]

98. [Not Sure]

99. [Refused]

B7. The purpose of these signs is to encourage you to purchase a more energy-efficient option when looking for [FILL SUB-PROGRAM]. How likely is it that you would look for and purchase the more efficient option based on these signs?

1	2	3	4	5	98	99
---	---	---	---	---	----	----

Extreme
ly
unlikely

Extreme
ly likely

Not
sure

Refused

IF B7=1, 2, OR 3, PROCEED TO B8. IF B7=4 OR 5, SKIP TO B9.

B8. How could the signs be improved?

[OPEN ENDED RESPONSE]

98. [Not Sure]

99. [Refused]

B9. What is most influential in this sign?

[OPEN ENDED RESPONSE]

98. [Not Sure]

99. [Refused]

B10. After reviewing the program signs, do you have any additional questions?

1. Yes

2. No

97. [Other][Specify]

98. [Not Sure]

99. [Refused]

[IF B10=1, PROCEED TO B1. IF B10=2, 97, 98 OR 99, SKIP TO B12.]

B11. What questions do you have?

[OPEN END RESPONSE]

98. [Not Sure]

99. [Refused]

B12. Which advertised products did you look at?

[OPEN END RESPONSE]

B13. Please take a picture of the rebate, instant discount, or energy savings sign that you like the most? [RESPONDENT TO UPLOAD PICTURE]

C. INTERACTIONS WITH SALES ASSOCIATES

Next, we'd like to ask you a few questions about any interactions that you had with sales associates while viewing products in this section of the store.

C1. Did you speak to a store sales representative or sales associate while looking at [SUB-PROGRAM]?

- 1. Yes
- 2. No
- 97. [Other][Specify]
- 98. [Not Sure]
- 99. [Refused]

[IF C1=1, PROCEED TO C2. If C1 =2, 97, 98, OR 99, Skip to SECTION D: MOTIVATIONS AND DECISIONS TO PURCHASE]

C2. Did the sales associate ask questions to find out what you were shopping for?

- 1. Yes
- 2. No
- 97. [Other][Specify]
- 98. [Not Sure]
- 99. [Refused]

C3. Did the sales associate show you energy-efficient products? [FILL: (THAT QUALIFY FOR INSTANT DISCOUNTS OR REBATES) IF [SUB-PROGRAM] = LIGHTING OR APPLIANCES (DOWNSTREAM)?

- 1. Yes
- 2. No
- 97. [Other][Specify]
- 98. [Not Sure]
- 99. [Refused]

[ASK IF C3= 1. IF C3=2, 97, 98, OR 99, C6.]

C4. How many qualifying products did the sales associates show you?

[OPEN ENDED RESPONSE]

C5. What did the sales associate tell you about these products? Did he/she discuss product...[SELECT ALL THAT APPLY] [ROTATE]

- 1. Functionality
- 2. Cost
- 3. Energy savings
- 4. Rebates available for products
- 5. Instant discounts for products
- 97. [Other][Specify]
- 98. [Not Sure]
- 99. [Refused]

C6. Did the sales associate direct you to visit the energysaveohio-home.com website for additional information?

- 1. Yes
- 2. No
- 97. [Other][Specify]
- 98. [Not Sure]
- 99. [Refused]

C7. How much do you agree or disagree with each of the following statements:

	Completely disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Completely agree
	1	2	3	4	5
a. The sales associate was knowledgeable in discussing energy-efficient products. [FILL: (THAT QUALIFY FOR INSTANT DISCOUNTS OR REBATES) IF [SUB-PROGRAM] = LIGHTING OR APPLIANCES (DOWNSTREAM)]					
b. Information provided by the sales associate was easy to understand.					
c. Information provided by the sales associate was useful.					

D. MOTIVATIONS AND DECISION TO PURCHASE

D1. Based on the in-store advertisements, how likely would you be to purchase this product the next time you need [SUB-PROGRAM]?

1	2	3	4	5	98	99
Definitely would not purchase				Definitely would purchase	Not sure	Refused

D2. Based on your discussion with the sales associate, how likely would you be to purchase this product the next time you need [SUB-PROGRAM]?

1	2	3	4	5	98	99
Definitely would not purchase				Definitely would purchase	Not sure	Refused

[PROGRAMMING NOTE: ONLY ASK D5 IF [SUB-PROGRAM] = APPLIANCES (DOWNSTREAM)].

D3. The rebate amount is enough to convince me to buy the qualifying product over the non-qualifying products.

- 1. Yes
- 2. No
- 97. [Other][Specify]
- 98. [Not Sure]
- 99. [Refused]

[IF D5 = 1, SKIP TO SECTION 3: PROGRAM PRODUCTS AND PRODUCT PLACEMENT. IF D5=2, 97, 98 OR 99, PROCEED TO D6.]

D4. To convince me to buy a qualifying product, the rebate or discount amount should be increased...

- 1. A lot more
- 2. A little more
- 3. Is just right
- 98. [Not Sure]
- 99. [Refused]

E. PROGRAM PRODUCTS AND PRODUCT PLACEMENT

E1. Were you able to find the products that were highlighted in these signs?

- 1. Yes
- 2. No
- 97. [Other][Specify]
- 98. [Not Sure]
- 99. [Refused]

E2. How much do you agree or disagree with each of the following statements:

	Completely disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Completely agree
	1	2	3	4	5
a. I could easily locate products that were advertised.					
b. Products were easily accessible.					

PROGRAMMING NOTE: ONLY ASK E3 IF [SUB-PROGRAM] = LIGHTING.

E3. Based on information you saw or received in-store, how confident do you feel in purchasing the correct light bulb to meet your needs?

1	2	3	4	5	98	99
Not at all confident				Extremely confident	Not sure	Refused

F. ADDITIONAL SUB-PROGRAM BATTERY

PROGRAMMING NOTE: ASK F1 ONLY IF TABLE 4, COLUMN 4 “SUB-PROGRAM FILL FOR PROGRAMMING – SECONDARY” DOES NOT EQUAL “NONE”. IF TABLE 4,

COLUMN 4 “SUB-PROGRAM FILL FOR PROGRAMMING – SECONDARY” EQUALS “NONE”, SKIP TO SECTION G: OVERALL CUSTOMER SATISFACTION.

F1. Thank you for answering these questions. Would you be willing to answer a few more questions on a different product in this store?

1. Yes

2. No

97. [Other][Specify]

98. [Not Sure]

98. [Not Sure]

G. OVERALL CUSTOMER SATISFACTION

G1. On a scale of 1 to 5, with 1 being extremely dissatisfied and 5 being extremely satisfied, how satisfied were you with your overall experience at [FILL RETAIL LOCATION] today?

1	2	3	4	5	98	99
Not at all confident				Extremely confident	Not sure	Refused

G2. What, if anything, could have been improved to make your shopping experience today better? [OPEN END RESPONSE]

98. [Not Sure]

99. [Refused]

Thank you. Those are all the questions we have today. FirstEnergy's Ohio utilities appreciate your feedback.

H. 2017 EE Products Program Participant Telephone Survey

**2017 EE Products Program
Participant Telephone Survey (Downstream)**

Question 1

Hello, my name is (interviewer name), and I am calling on behalf of (name of EDC), your electric utility company. May I speak with (name of respondent)?

Yes 01

No 02

[IF NOT AVAILABLE, ASK FOR ANOTHER
ADULT FAMILIAR WITH HOUSEHOLD'S
PARTICIPATION IN ENERGY EFFICIENT
PRODUCTS PROGRAM]

Question 2

I'm calling for ADM Associates, an independent research firm. We are speaking with households that participated in [UTILITY] Energy Efficient Products Program. Through this program you may have received a rebate for the purchase of energy efficient products like an ENERGY STAR certified refrigerator, dryer, or clothes washer. Do you recall participating in this program?

Yes 01 [SKIP TO Q5]

No 02

Don't Know 98

Refused 99 [THANK AND TERMINATE]

Question 3

Is it possible that someone else in your household would be familiar with the products or services you received through this program?

Yes 01 [SKIP TO Q4]

No 02 [THANK AND TERMINATE]

Don't Know	98	[THANK AND TERMINATE]
Refused	99	[THANK AND TERMINATE]

Question 4

May I speak with that person?

Yes	01	[RECYCLE THROUGH Q2 and Q3 WITH NEW RESPONDENT]
No	02	[THANK AND TERMINATE]
Don't Know	98	[THANK AND TERMINATE]
Refused	99	[THANK AND TERMINATE]

Question 5

Great, thank you. First, I want to assure you that I'm not selling anything. We are calling program participants to verify information about the products and services received and to assess customer satisfaction with the products and services. You will receive a \$5 gift card for Target for participating in this survey. May I take a few minutes to talk with you about the products and services you received and how satisfied you have been with those products and services?

Yes	01	[PROCEED WITH INTERVIEW]
No	02	[THANK AND TERMINATE]
Refused	99	[THANK AND TERMINATE]

THE INTERVIEW

Question 6

First, could you tell me how you heard about the rebates available through the Energy Efficient Products program? [DO NOT READ; INDICATE ALL THAT APPLY, PROMPT IF NECESSARY]

Bill Insert	01
Direct Mail from Utility	02
FirstEnergy: Energy Save Ohio website	03
Retail Store	04
Contractor	05
Print Ad	06
Radio	07
Word-of-Mouth	08
Internet Search	09
Other (specify)	10
Don't recall	98
Refused	99
Specify Other:	_____

[ASK Q7 if Q6 = 04]

Question 7

While in the retail store, how did you learn about rebates available for ENERGY STAR certified Appliances?

	Yes	No	DK	NA
a. A store employee	01	02	98	99
b. Store signage near appliances displays		01	02	98 99
c. Other (Specify)				

Question 8

Next, I would like to verify the products for which you received a rebate through the program. Our records indicate that you received a rebate for [INSERT ALL MEASURES]. Is that correct?

[READ ITEM FOR WHICH REBATE WAS PAID; RECORD ANSWER INDICATED BY RESPONDENT]

	Yes	No	DK	NA
a. Energy Star Refrigerator		01	02	98 99
b. Energy Star Clothes Washer		01	02	98 99
c. Energy Star Clothes Dryer		01	02	98 99

[ASK FOLLOW-UP QUESTIONS ONLY ABOUT REBATED PRODUCTS & SERVICES]

ENERGY STAR REFRIGERATOR

[ASK Q9-Q14 IF Q8A = 1]

Question 9

Was this refrigerator purchased:

To replace a functioning unit	01
To replace a broken unit	02
Not a replacement	03
(Did not previously own one/wanted another)	
Don't know	98
Refused	99

Question 10

[ASK Q10 IF Q9A = 01, 02]

What has been done with the old unit?

Still have it	01
Recycled through recycling program	02
Took it to the dump	03
Sold it for scrap metal	04
Sold for parts	05
Sold or gifted unit to an individual	06
Sold or donated to an organization/company.	07
Company name: _____	
Don't know	98
Refused	99

[ASK Q11 IF Q10 = 1]

Question 11

Is the old refrigerator still in use and plugged in?

Yes	01
No	02
Don't know	98
Refused	99

[ASK Q12 IF Q11 = 2]

Question 12

Do you know that [UTILITY] provides rebates for recycling your old (working) refrigerator?

Yes	01
No	02

Don't know	98
Refused	99

[ASK Q13 IF Q12 = 1]

Question 13

Why was the refrigerator not recycled through the [UTILITY] Program?

The incentive wasn't high enough	01
Options for pick up times were not convenient	02
Did not know how to participate in program	03
Other (Specify)	04
Don't know	98
Refused	99

Question 14

Why did you select this model or type of refrigerator? (Select all that apply)

It was a good price	01
There was a rebate for it	02
It costs less to operate	03
It's good for the environment	04
It was all that was available	05
The retailer recommended it	06
It had the features I wanted	07
It was the right size/color	08
Wanted the brand	09
Other (Specify)	
Don't know	98

Refused	99
---------	----

ENERGY STAR CLOTHES WASHER

[ASK Q15-Q17 IF Q8B = 1]

Question 15

Can you tell me whether you have an electric or gas water heater?

Gas	01	
Electric		02
Don't know	98	
Refused	99	

[ASK Q16 IF Q15 = 98]

Question 16

Please look at the top of the water heater for an electrical supply cord. This looks like a thick extension cord and is typically black or gray. Do you see a cord like I described?

Yes	01	
No		02
Don't know	98	
Refused	99	

Question 17

Why did you select this model or type of clothes washer? (Select all that apply)

It was a good price	01
There was a rebate for it	02

It costs less to operate	03
It's good for the environment	04
It was all that was available	05
The retailer recommended it	06
It had the features I wanted	07
It was the right size/color	08
Wanted the brand	09
Other (Specify)	
Don't recall	98
Refused	99

ENERGY STAR CLOTHES DRYER

[ASK Q18 if Q8C = 1]

Question 18

Why did you select this model or type of clothes dryer? (Select all that apply)

It was a good price	01
There was a rebate for it	02
It costs less to operate	03
It's good for the environment	04
It was all that was available	05
The retailer recommended it	06
It had the features I wanted	07
It was the right size/color	08
Wanted the brand	09
Other (Specify)	
Don't recall	98
Refused	99

Program Satisfaction

I'd like to ask you just a few more questions about your satisfaction with the EE Products Program.

Question 19

(DISPLAY A ROW FOR EACH MEASURE IDENTIFIED IN Q9) Using the scale provided, please rate how satisfied or dissatisfied you were with the rebate amount for the following:

	Very Satisfied	Somewhat satisfied	Neutral	Somewhat dissatisfied	Very Dissatisfied	Don't know
DISPLAY	1	2	3	4	5	98
ANSWERS						
IF Q8=01						

Question 20

From the time you had the equipment installed/picked up and submitted the application, about how many weeks did it take to receive your rebate?

_____RECORD # of WEEKS

Refused 98

Don't know 99

Question 21

(DISPLAY A ROW FOR EACH MEASURE IDENTIFIED IN Q9) Using the scale provided, please rate how satisfied or dissatisfied you were with how long it took to receive the rebate for item listed below:

	Very Satisfied	Somewhat satisfied	Neutral	Somewhat dissatisfied	Very Dissatisfied	Don't know
DISPLAY	1	2	3	4	5	98
ANSWERS						
IF Q8=01						

Question 22

In the course of participating in the program, how often did you contact [UTILITY] or program staff with questions?

Never	01
Once	02
2 or 3 times	03
4 times or more	04
Refused	98
Don't know	99

[ASK Q23 IF Q22 = 2,3,4]

Question 23

How did you contact them? [SELECT ALL THAT APPLY]

Phone	01
Email	02
Letter	03
In person	04
Refused	98
Don't know	99

[ASK Q24 IF Q22 = 2, 3, 4]

Question 24

And how satisfied or dissatisfied were you with your communications with [UTILITY] and program staff? Would you say you were:

Very satisfied	01	S8
Somewhat satisfied	02	S8
Neither satisfied nor dissatisfied	03	S8
Somewhat dissatisfied	04	continue
Very dissatisfied	05	continue
Refused	98	S8
Don't know	99	S8

[ASK Q25 IF Q24 = 4,5]

Question 25

Why were you dissatisfied? [Record Verbatim or Refused=98, Don't know=99]

Question 26

Have you noticed any savings on your electric bill since installing your new [MEASURE_GENERIC]/removing your old [APPLIANCE]?

Yes	01	continue
No	02	S10
Not sure	03	S10
Refused	98	S10
Don't know	99	S10

Question 27

(DISPLAY A ROW FOR EACH MEASURE IDENTIFIED IN Q8) Using the scale below, how satisfied or dissatisfied are you, overall, with each of the appliances/equipment listed below:

	Very Satisfied	Somewhat satisfied	Neutral	Somewhat dissatisfied	Very Dissatisfied	Don't know
DISPLAY	1	2	3	4	5	98
ANSWERS						
IF Q8=01						

[ASK Q28 IF Q27 = 4,5]

Question 28

Why aren't you satisfied? [Record Verbatim or Refused=98, Don't know=99]

Finally, if you were rating your overall satisfaction with the [UTILITY] Energy Efficient Products Program, would you say you were:

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

Question 29

Do you have any additional comments for [UTILITY] regarding your experience or suggestions to improve the program?

_____(Record Response)	01
No	02

Refused	98
Don't know	99

HOME DEMOGRAPHICS

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

Question 30

Which of the following best describes your residence? [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: _____

Question 31

Do you own or rent this residence?

Own	01
Rent	02
Don't Know	98
Refused	99

Question 32

Approximately when was your residence 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

Question 33

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

Square Feet: _____

Don't know	98
Refused	99

[ASK Q34 IF Q33 = 98 OR 99]

Question 34

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

Question 35

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 Q36 IF Q35 is 98 OR 99]

Question 36

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

Question 37

How many people are living or staying at this address?

Include everyone who is living or staying here for more than 2 months.

Include yourself if you are living or staying here for more than 2 months.

Include anyone else staying here who does not have another place to stay, even if they are here for less than two months.

Do not include anyone who is living somewhere else for more than two months, such as a college student living away or someone in the Armed Forces on deployment.

_____ Record Number [1-97]

Don't know 98

Refused 99

Question 38

What is your approximate total household income? [READ CATEGORIES]

Less than \$10,000 01

\$10,000 to \$29,999 02

\$30,000 to \$49,999 03

\$50,000 to \$69,999 04

\$70,000 to \$89,999 05

\$90,000 to \$99,999 06

\$100,000 to \$149,999 07

\$150,000 or more 08

Don't know 98

Refused 99

Question 39

Would you be interested in scheduling a follow-up home visit with ADM associates as an additional step of verification of the measures installed at your home? You will receive an additional \$20.00 gift card for Target for your courtesy at the time of the appointment.

Yes 01
No 02
Refused 99

[ASK Q40 IF Q39 = 01]

Question 40

Can you please confirm your current address for the site visit?

Confirmed Address _____

Question 41

Thank you for your time in answering questions regarding your appliance purchases in Ohio. We have finished with the questions for this survey. We would like to mail you a \$5 Target gift card for your participation. To do that I'll need to confirm your mailing information at this time.

According to our records your mailing address is [ADDRESS]. Is that correct?

Yes 01
No 02

[ASK Q42 IF Q41 = 2]

Question 42

What is your mailing address?

_____ [RECORD FULL MAILING ADDRESS]

Thank you again for your time. You can expect to receive the gift card in 4-6 weeks. Have a great day!

I. 2017 FirstEnergy's Ohio Customer Action Program/ EE Products Random Digit Dial Telephone Survey

**2017 FirstEnergy's Ohio Customer Action Program/EE Products
Random Digit Dial Telephone Survey (Upstream**

[START]

INTRO. Hello, my name is _____, and I'm calling from ADM Associates, an independent research firm, conducting a survey regarding household lighting and appliance or electronics purchases in Ohio on behalf of FirstEnergy's Ohio Utilities. First I want to assure you that I'm not selling anything. I am calling to ask a few brief questions about any light bulbs or appliances you may have purchased for your home in 2017. The survey should only take about ten minutes, and your answers will be completely anonymous. We are offering a \$5.00 Walmart gift card for your participation. May I please speak with an adult in the household who is responsible for purchasing the light bulbs or appliances/electronics for your home?

Yes, I purchase lights 01 [GO TO Q2]

Someone else does it 02 [ASK TO SPEAK WITH PERSON, REPEAT
INTRODUCTION
THEN GO TO Q2]

No 03 [TRY TO RESCHEDULE AND THEN TERMINATE]

Q1REF. 01 Person available [CONTINUES]

02 Person not available [SETUP CALL-BACK]

03 Refused to transfer to correct person. [TERMINATE]

Electric Utility and Location Information

U1. First of all, to ensure your eligibility to participate, we need to determine that you are a customer of one of FirstEnergy's Ohio utilities. What is the name of your electric utility? [DO NOT READ, LET PARTICIPANT ANSWER]

Ohio Edison 01

The Illuminating Company 02

Toledo Edison 03

FirstEnergy 04

Other 05 [RECORD ANSWER]

U2. [SKIP IF U1 != 05] Based on your electric utility it does not appear you are eligible for this survey. Thank you for your time and have a nice day. [TERMINATE]

U3. Would you mind providing me with your zip code?

_____ [RECORD 5 DIGIT ZIP]

Don't know 98

Refused 99

Awareness of Bulb Types

I'd like to ask you a few questions about your awareness of different types of light bulbs. The most common type of CFL is made with a glass tube bent into a spiral. It generally looks like a corkscrew and uses less energy than a typical incandescent light bulb.

B1. Before this call today, had you ever heard of compact fluorescent light bulbs, or CFLs?

Yes 01

No 02

Don't know 98

Refused 99

LED light bulbs are a newer light bulb technology that fit in regular light bulb sockets, but have various appearances. LED bulbs are typically a lot heavier than incandescent bulbs. They use less energy and last much longer than typical incandescent light bulbs.

B2. Before this call today, had you ever heard of light emitting diode light bulbs, or LEDs?

Yes 01

No 02

Don't know 98

Refused 99 [READ E2]

In 2012 the federal government began enforcing a law that required regular light bulbs to use less energy but produce the same amount of light. The technology in these increased efficiency incandescent light bulbs changed from filament style to halogen bulbs. The halogen bulbs are typically marketed using wattage equivalents, which are designed to show the increased energy efficiency of the halogen bulbs compared to the standard incandescent bulbs. For example, the 72 Watt halogen bulb packaging will show a lighting equivalent of a 100 Watt standard incandescent bulb.

B3. Before this call today, had you ever heard of increased efficiency incandescent bulbs, or halogens?

Yes	01
No	02
Don't know	98
Refused	99

B4. Conventional light bulbs are known as incandescent light bulbs. Do you think you could correctly identify the following types of light bulbs, a typical incandescent light bulb, CFL light bulb, LED light bulb, and a halogen light bulb if all four were placed in front of you?

	Yes	No	Don't Know	Refused
a. A typical incandescent light	1	2	98	99
b. CFL light bulb	1	2	98	99
c. LED light bulb	1	2	98	99
d. Halogen light bulb	1	2	98	99

Recent Light Bulb Purchases

RL1. I'd like to ask you a few questions about bulbs you purchased this year. In 2017, have you purchased any light bulbs?

Yes	01
No	02
Don't know	98
Refused	99

RL2. Do you plan on purchasing any light bulbs or fixtures during the remainder of this year? If so what type do you plan on purchasing?

Halogen	01
CFL	02
LED	03
LED fixture	04
Incandescent	05
Other(Specify)	06

No plans to purchase	99
----------------------	----

[IF RL2 = 99 SKIP TO Q28]

RL3. In 2017, about how many light bulbs would you say you have purchased? [READ ANSWERS
If respondent unsure, say "Your best estimate is OK."]

1-5	01
6-10	02
11-15	03
16-20	04
21-25	05
25-30	06
More than 30	Record exact respondent estimate
None	97
Don't know	98
Refused	99

RL4. Have you purchased any compact fluorescent light bulbs, also known as CFLs, during 2017?

Yes	01
No	02
Don't know	98
Refused	99

RL5. Have you purchased any light emitting diode bulbs, also known as LEDs, during 2017?

Yes	01
No	02
Don't know	98
Refused	99

RL6. LED fixtures are light fixtures that use LED technology and are wired directly instead of screwed in. They typically have a lower wattage and longer lifespan than equivalent screw in bulbs. Have you purchased any light emitting diode fixtures, also known as LED fixtures, during 2017?

Yes	01
No	02
Don't know	98
Refused	99

RL7. Have you purchased any increased efficiency incandescent bulbs, also known as halogens, during 2017?

Yes	01
No	02
Don't know	98
Refused	99

RL8. [SKIP IF RL4=02, 98, or 99 AND RL5=02, 98, or 99 AND RL6=02, 98, or 99 AND RL7=02, 98, or 99] SKIP IF RL3 = 97, 98 or 99] I'd like to ask you about the number of different bulb types you have purchased in 2017. You mentioned earlier that you have purchased [ANSWER FROM RL3] light bulbs in 2017. How many of those bulbs were CFLs, LEDs, LED fixtures or halogen bulbs? An example would be 5 CFLs, 5 LEDs, and 5 halogens. [If respondent unsure, say "again, your best estimate is OK."] [IF RESPONDENT INDICATES BELOW/ABOVE [ANSWER TO RL3] TOTAL, PROMPT TO GIVE [ANSWER TO RL3] TOTAL]

_____	Record number of CFLs
_____	Record number of LEDs
_____	Record number of halogens
_____	Record number of LED Fixtures
Don't know	98
Refused	99

RL9. [SHOW IF any bulbs purchased] When did you last purchase each of the following type of bulbs. [USE 9998 FOR DK, 9999 FOR REFUSED]

CFLs Date: MMYYYY
LEDs Date: MMYYYY
Halogens Date: MMYYYY
LED Fixtures Date: MMYYYY

RL10. [SKIP IF RL4=02, 98, or 99 AND RL5=02, 98 or 99, AND RL6=02, 98, or 99, , AND RL7=02, 98, or 9] Were any of the CFLs, LEDs, halogen bulbs or LED fixtures you purchased in 2017 installed in a business or commercial building?

Yes	01 [READ RL11]
No	02
Don't know	98
Refused	99

RL11. [ASK IF Q16 = 01] Approximately how many of the [Number of CFLs + LEDs + Halogen + LED Fixtures from Q15] CFLs, LEDs or Halogens you said you purchased were installed in a business or commercial building?

_____	CFLs [RECORD NUMBER, 0 – 97] [ask if Q15CFLS>0]
_____	LEDs [RECORD NUMBER, 0 – 97] [ask if Q15LEDS>0]
_____	Halogens [RECORD NUMBER, 0 – 97] [ask if Q15HalogenS>0]
_____	LED Fixtures [RECORD NUMBER, 0 – 97] [ask if Q15LEDS>0]
Don't know	98
Refused	99

Prior Purchases/ Program Awareness/ Satisfaction

[ASK IF RL4 = 01]

PP1. Prior to 2017, had you ever purchased CFL light bulbs?

Yes	01
No	02
Don't know	98
Refused	99

[ASK IF RL5 = 01]

PP2. Prior to 2017, had you ever purchased LED light bulbs?

Yes	01
No	02

Don't know	98
Refused	99

PP3. Please rate, on a scale of 1-5, how satisfied or dissatisfied you are with the LED bulbs you purchased? [Where 1-Extremely dissatisfied. 2- dissatisfied, 3-neutral, 4- satisfied, 5-extremely satisfied]

_____ [RECORD RESPONSE]

Have you noticed a difference on your electric bill?

Yes, I've noticed savings	01
No	02
Open Ended	[RECORD RESPONSE]

[ASK IF RL6 = 01]

PP4. Prior to 2017, had you ever purchased LED fixtures? LED fixtures are light fixtures that use LED technology and are wired directly instead of screwed in.

Yes	01
No	02
Don't know	98
Refused	99

[ASK IF RL7 = 01]

PP5. Prior to 2017, had you ever purchased halogen light bulbs?

Yes	01
No	02
Don't know	98
Refused	99

In-Service Rate

ISR1. [SKIP IF Q10 <> 01 OR ([SKIP IF RL4=02, 98, or 99 AND RL5=02, 98, or 99 AND RL6=02, 98, or 99 AND RL7=02, 98, or 99] SKIP IF RL3 = 97, 98 or 99)] Again, you said you purchased

[Number of CFLs + LEDs + LED Fixtures +Halogen from Q15] in 2017. How many of those CFLs, LEDs or halogens would you estimate you installed within one week of purchase?

_____ [RECORD NUMBER, 0 – 97. IF RESPONDENT SAYS “100%” or “ALL”,
THEN

SKIP TO Q21]

Don't know 98

Refused 99

ISR2. [SKIP IF Q10 != 01 [SKIP IF RL4=02, 98, or 99 AND RL5=02, 98, or 99 AND RL6=02, 98, or 99 AND RL7=02, 98, or 99] SKIP IF RL3 = 97, 98 or 99] How many of those CFLs, LEDs or Halogens purchased did you save to install at a later date?

_____ [RECORD NUMBER, 0 – 97. IF RESPONDENT SAYS “100%” or “ALL”,
THEN

SKIP TO Q21]

Don't know 98

Refused 99

ISR3. Approximately how many of the light bulbs you purchased have you not installed? [If respond is unsure, say “Your best estimate is okay.”]

_____ CFLs [RECORD NUMBER, 0 – 97.]

_____ LEDs [RECORD NUMBER, 0 – 97.]

_____ Halogens [RECORD NUMBER, 0 – 97.]

_____ LED Fixtures [RECORD NUMBER, 0 – 97.]

Don't know 98

Refused 99

Purchase

Reasoning

RS1. [ASK IF RL4 = 01] You mentioned you have purchased CFL light bulbs in 2017. When you purchased these CFLs, why did you make the purchase?

[DO NOT READ RESPONSES. RECORD ALL RESPONSES. IF respondent says “I needed bulbs” or similar, PROMPT for more detailed explanation.]

Replaced burned out bulbs 01

Replace working bulbs, wanted to lower energy usage 02

Installed in a new light fixture or lamp socket	03
Improve lighting quality/brighten a room	04
Replaced burned out bulbs & working bulbs at same time	05
Stock up on bulbs	06
Good deal prompted purchase	07
Other (describe) _____	
Don't know	98
Refused	99

RS2. [ASK IF RL5 = 01] You mentioned you have purchased LED light bulbs in 2017. When you purchased these LEDs, why did you make the purchase?

[DO NOT READ RESPONSES. RECORD ALL RESPONSES. IF respondent says "I needed bulbs" or similar, PROMPT for more detailed explanation.]

Replaced burned out bulbs	01
Replace working bulbs, wanted to lower energy usage	02
Installed in a new light fixture or lamp socket	03
Improve lighting quality/brighten a room	04
Replaced burned out bulbs & working bulbs at same time	05
Stock up on bulbs	06
Good deal prompted purchase	07
Promotion of LED bulbs changed my mind	08
Other (describe) _____	
Don't know	98
Refused	99

RS3. Did you know [ANSWER U1] provides funds to reduce the price of LED bulbs purchased at retail stores?

Yes	01
No	02
Don't know	98
Refused	99

[SHOW RS4 TO RS5 IF RS3 = 1]

RS4. How did you learn about the discounted price?

Retail Store Signage	01
Retail Store Employee	02
Utility Marketing	03
Friend/Family	04
TV/Radio/Internet Advertising	05
Other(Specify)	
Don't Know	98

RS5. To the best of your knowledge, were the LED bulbs you purchased in 2017 discounted through your utility?

Yes	01
No	02
Don't know	98
Refused	99

RS6. Please rate, on a scale of 1-5, how satisfied or dissatisfied you are with the LED light bulbs you purchased? [Where 1-Extremely dissatisfied. 2- dissatisfied, 3-neutral, 4- satisfied, 5-extremely satisfied]

_____ [RECORD RESPONSE]

RS7. Have you noticed a difference on your electric bill?

Yes, I've noticed savings	01
No	02

Open Ended [RECORD RESPONSE]

RS8. [ASK IF RL6 = 01] You mentioned you have purchased LED fixtures in 2017. When you purchased these LED fixture, why did you make the purchase? LED fixtures are light fixtures that use LED technology and are wired directly instead of screwed in.

[DO NOT READ RESPONSES. RECORD ALL RESPONSES. IF respondent says "I needed bulbs" or similar, PROMPT for more detailed explanation.]

Replaced burned out bulbs	01
---------------------------	----

Replace working bulbs, wanted to lower energy usage	02
Installed in a new light fixture or lamp socket	03
Improve lighting quality/brighten a room	04
Replaced burned out bulbs & working bulbs at same time	05
Stock up on bulbs	06
Good deal prompted purchase	07
Other (describe) _____	
Don't know	98
Refused	99

RS9. Did you know [ANSWER U1] provides funds to reduce the price of LED fixtures purchased at retail stores?

Yes	01
No	02
Don't know	98
Refused	99

[SHOW RS10 TO RS12 IF RS9 = 1]

RS10. How did you learn about the discounted price?

Retail Store Signage	01
Retail Store Employee	02
Utility Marketing	03
Friend/Family	04
TV/Radio/Internet Advertising	05
Other (Specify)	
Don't Know	98

RS11. To the best of your knowledge, were the LED fixtures you purchased in 2017 discounted through your utility?

Yes	01
No	02

Don't know	98
Refused	99

RS12. Please rate, on a scale of 1-5, how satisfied or dissatisfied you are with the LED fixtures you purchased, where 1-Extremely Dissatisfied. 2- Dissatisfied, 3-neutral, 4- Satisfied, 5-Extremely Satisfied.

_____ [RECORD RESPONSE]

RS13. Have you noticed a difference on your electric bill?

Yes, I've noticed savings 01

No 02

Open Ended [RECORD RESPONSE]

RS12. [ASK IF RL7 = 01] You mentioned you have purchased halogen light bulbs in 2017. When you purchased these halogens, why did you make the purchase?

[DO NOT READ RESPONSES. RECORD ALL RESPONSES. IF respondent says "I needed bulbs" or similar, PROMPT for more detailed explanation.]

Replaced burned out bulbs	01
Replace working bulbs, wanted to lower energy usage	02
Installed in a new light fixture or lamp socket	03
Improve lighting quality/brighten a room	04
Replaced burned out bulbs & working bulbs at same time	05
Stock up on bulbs	06
Good deal prompted purchase	07
Other (describe) _____	
Don't know	98
Refused	99

Bulb Types Replaced

RS1. [SKIP IF RL4=02, 98, or 99 AND RL5=02, 98, or 99 AND RL6=02, 98, or 99 AND RL7=02, 98, or 99] SKIP IF RL3 = 97, 98 or 99] Again, you said you purchased [Number of CFLs from RS4] CFLs in 2017. In which of the following locations did you install the CFLs? [Allow multiple answers]

Bedrooms	01
----------	----

Bathrooms	02
Living Room	03
Kitchen	04
Entry Way	05
Dining Room	06
Garage	07
Basement	08
Den	09
Stairway	10
Office	11
Hallway	12
Outdoor	13
Other Room/Location	14
Store for later installation	15
Don't know	98
Refused	99

RS2. Thinking about the new CFLs in your home, how many were installed?

_____ [RECORD NUMBER, 0 – 97]

Don't know	98
Refused	99

RS3. How many of the new CFLs replaced standard incandescent bulbs?

_____ [RECORD NUMBER, 0 – 97]

Don't know	98
Refused	99

RS4. How many of the new CFLs replaced halogens?

_____ [RECORD NUMBER, 0 – 97]

Don't know	98
Refused	99

RS5. How many of the new CFLs replaced old CFLs?

_____ [RECORD NUMBER, 0 – 97]

Don't know 98

Refused 99

RS6. How many of the new CFLs replaced LEDs?

_____ [RECORD NUMBER, 0 – 97]

Don't know 98

Refused 99

RS7. [[SKIP IF RL5=02, 98] SKIP IF RL3 = 97, 98 or 99]] Again, you said you purchased [Number of LEDs from Q15] LEDs in 2017. In which of the following locations do you install the LEDs?
[Allow multiple answers]

Bedrooms 01

Bathrooms 02

Living Room 03

Kitchen 04

Entry Way 05

Dining Room 06

Garage 07

Basement 08

Den 09

Stairway 10

Office 11

Hallway 12

Outdoors 13

Other Room/Location 14

Store for later installation 15

Don't know 98

Refused 99

RS8. Thinking about the new LEDs in your home, how many were installed?

_____ [RECORD NUMBER, 0 – 97]

Don't know 98

Refused 99

RS9. How many of the new LEDs replaced standard incandescent bulbs?

_____ [RECORD NUMBER, 0 – 97]

Don't know 98

Refused 99

RS10. How many of the new LEDs replaced halogens?

_____ [RECORD NUMBER, 0 – 97]

Don't know 98

Refused 99

RS11. How many of the new LEDs replaced CFLs?

_____ [RECORD NUMBER, 0 – 97]

Don't know 98

Refused 99

RS12. How many of the new LEDs replaced old LEDs?

_____ [RECORD NUMBER, 0 – 97]

Don't know 98

Refused 99

RS13. [ASK IF RS6 = 01] Again, you said you purchased [Number of LED Fixtures from RL8] LED Fixtures in 2017. In which of the following locations did you install the LEDs? [Allow multiple answers]

Bedrooms 01

Bathrooms 02

Living Room 03

Kitchen 04

Entry Way	05
Dining Room	06
Garage	07
Basement	08
Den	09
Stairway	10
Office	11
Hallway	12
Outdoors	13
Other Room/Location	14
Store for later installation	15
Don't know	98
Refused	99

RS14. Thinking about the new LED fixtures in your home, how many were installed?

_____ [RECORD NUMBER, 0 – 97]

Don't know	98
Refused	99

RS15. How many of the new LED fixtures replaced standard incandescent bulbs?

_____ [RECORD NUMBER, 0 – 97]

Don't know	98
Refused	99

RS16. How many of the LED fixtures replaced halogens?

_____ [RECORD NUMBER, 0 – 97]

Don't know	98
Refused	99

RS17. How many of the new LED fixtures replaced CFLs?

_____ [RECORD NUMBER, 0 – 97]

Don't know	98
Refused	99

RS18. How many of the new LED fixtures replaced old LEDs?

_____ [RECORD NUMBER, 0 – 97]

Don't know	98
Refused	99

RS19. [ASK IF RS6 = 01 AND RS8 != 98 AND RS8 !=99 AND Q11 != 98 AND RS8 !=99 AND RS8 != 97 ELSE SKIP TO Q27] Again, you said you purchased [Number of Halogens from RS8] Halogens in 2017. In which of the following locations do you install the Halogens? [Allow multiple answers]

Bedrooms	01
Bathrooms	02
Living Room	03
Kitchen	04
Entry Way	05
Dining Room	06
Garage	07
Basement	08
Den	09
Stairway	10
Office	11
Hallway	12
Outdoors	13
Other Room/Location	14
Store for later installation	15
Don't know	98
Refused	99

RS20. Thinking about the new Halogens in your home, how many were installed?

_____ [RECORD NUMBER, 0 – 97]

Don't know	98
Refused	99

RS21. How many of the new Halogens replaced standard incandescent bulbs?

_____ [RECORD NUMBER, 0 – 97]

Don't know	98
Refused	99

RS22. How many of the new Halogens replaced old Halogens?

_____ [RECORD NUMBER, 0 – 97]

Don't know	98
Refused	99

RS23. How many of the new Halogens replaced CFLs?

_____ [RECORD NUMBER, 0 – 97]

Don't know	98
Refused	99

RS24. How many of the new Halogens replaced LEDs?

_____ [RECORD NUMBER, 0 – 97]

Don't know	98
Refused	99

RS25. [SKIP IF (RS4=02,98,99 AND RS5=02,98,99 AND RS6=02,98,99 AND RS7=02,98,99)]

Of the light bulbs you purchased in 2017, were any of them purchased through any of the following retail stores: [READ LIST, CHECK ALL THAT APPLY]

The Home Depot	01
Lowes Home Improvement	02
Sam's Club	03
Walmart	04
Costco	05
Sears	06

Hartville Hardware	07
Other(Specify)	08
Don't know	98
Refused	99

Appliance Basics

AP. Since January 1, 2017, have you purchased or had installed ANY of the following items in your home/residence: Refrigerator, Freezer, Dehumidifier, Room Air Conditioner, High-Efficiency Central Air Conditioner, Heat Pump or Mini-Split Heat Pump?

Q.	Appliance	Yes	No	DK	REF
AP1	Refrigerator				
AP2	Freezer				
AP3	Dehumidifier				
AP4	Room Air Conditioner				
AP5	Central AC				
AP6	Heat Pump				
AP7	Mini-Split Heat Pump				

Refrigerator

[ASK RF1 – RF12 IF AP1 = Y]

RF1. What kind of Refrigerator model did you purchase? [READ ANSWERS]

Top-freezer refrigerator model	01
Bottom-freezer refrigerator model	02
Side-by-side refrigerator model	03
Don't know	98
Refused	99

RF2. Was the refrigerator you purchased Energy Star certified?

Yes	01
No	02
Don't know	98
Refused	99

RF3. Do you remember the month in 2017 when you purchased the refrigerator?

_____ [ENTER MONTH]	
Don't know	98
Refused	99

RF4. Was this refrigerator purchased: [READ ANSWERS AND RECORD RESPONSE]

To replace a functioning unit	01
To replace a broken unit	02
Not a replacement	03
Don't know	98
Refused	99

RF5. [ASK IF Q29 = 02] Why didn't you repair the broken unit?

Too costly	01
Too much time involved	02
Wanted to change style	03
Don't know	98
Refused	99

RF6. What did you do with your old unit?

Still have it, not in use	01
Recycled the unit	02
Took it to the dump	03
Sold it for scrap metal	04
Sold for parts	05
Sold or gifted unit to an individual	06

Sold or donated to an organization/company.	07
Company name: _____	
Don't know	98
Refused	99

RF7. For the refrigerator you bought, was it purchased through any of the following retail stores:
[READ LIST, CHECK ALL THAT APPLY]

The Home Depot	01
Lowes Home Improvement	02
Sam's Club	03
Walmart	04
Costco	05
Sears	06
Hartville Hardware	07
Other(Specify)	
Don't know	98
Refused	99

RF8. Did you know [ANSWER U1] provides funds to reduce the price of refrigerators purchased at retail stores?

Yes	01
No	02
Don't know	98
Refused	99

[SHOW RF9 TO RF10 IF RF8 = 1]

RF9. How did you learn about the discounted price?

Retail Store Signage	01
Retail Store Employee	02
Utility Marketing	03
Friend/Family	04

TV/Radio/Internet Advertising	05
Other(Specify)	
Don't Know	98

RF10. To the best of your knowledge, was the refrigerator you purchased in 2017 discounted through your utility?

Yes	01
No	02
Don't know	98
Refused	99

RF11. Please rate, on a scale of 1-5, how satisfied or dissatisfied you are with the refrigerator you purchased, where 1-Extremely Dissatisfied. 2- Dissatisfied, 3-neutral, 4- Satisfied, 5-Extremely Satisfied.

_____ [RECORD RESPONSE]

RF12. Have you noticed a difference on your electric bill?

Yes, I've noticed savings	01
No	02
Open Ended[RECORD RESPONSE]	
Don't know	98
Refused	99

Freezer

[ASK FZ1-FZ12 IF AP2 = Y]

FZ1. What kind of freezer model did you purchase? [READ ANSWERS]

Chest freezer, with the lid on top	01
Upright Freezer, with the door on the front	02
Don't know	98
Refused	99

FZ2. Was the freezer you purchased Energy Star certified?

Yes	01
-----	----

No	02
Don't know	98
Refused	99

FZ3. Do you remember the month in 2017 when you purchased the freezer?

_____	[ENTER MONTH2
Don't know	98
Refused	99

FZ4. Was this freezer purchased: [READ ANSWERS AND RECORD RESPONSE]

To replace a functioning unit	01
To replace a broken unit	02
Not a replacement	03
Don't know	98
Refused	99

FZ5. [ASK IF Q37 = 02] Why didn't you repair the broken unit?

Too costly	01
Too much time involved	02
Wanted to change style	03
Don't know	98
Refused	99

FZ6. What did you do with your old unit?

Still have it, not in use	01
Recycled the unit	02
Took it to the dump	03
Sold it for scrap metal	04
Sold for parts	05
Sold or gifted unit to an individual	06
Sold or donated to an organization/company.	07

Company name: _____

Don't know	98
Refused	99

FZ7. For the freezer you bought, was it purchased through any of the following retail stores:
[READ LIST, CHECK ALL THAT APPLY]

The Home Depot	01
Lowes Home Improvement	02
Sam's Club	03
Walmart	04
Costco	05
Sears	06
Hartville Hardware	07
Other(Specify)	
Don't know	98
Refused	99

FZ8. Did you know [ANSWER Q2] provides funds to reduce the price of freezers purchased at retail stores?

Yes	01
No	02
Don't know	98
Refused	99

[SHOW FZ9 TO FZ10 IF FZ8 = 1]

FZ9. How did you learn about the discounted price?

Retail Store Signage	01
Retail Store Employee	02
Utility Marketing	03
Friend/Family	03
TV/Radio/Internet Advertising	04

Other (Specify)	
Don't Know	98

FZ10. To the best of your knowledge, was the freezer you purchased in 2017 discounted through your utility?

Yes	01
No	02
Don't know	98
Refused	99

FZ11. Please rate, on a scale of 1-5, how satisfied or dissatisfied you are with the freezer you purchased, where 1-Extremely Dissatisfied. 2- Dissatisfied, 3-neutral, 4- Satisfied, 5-Extremely Satisfied.

_____ [RECORD RESPONSE]

FZ12. Have you noticed a difference on your electric bill?

Yes, I've noticed savings	01
No	02
Open Ended	[RECORD RESPONSE]
Don't know	98
Refused	99

Dehumidifier

[ASK DH1 – DH10 IF AP3 = Y]

DH1. Was the dehumidifier you purchased Energy Star certified?

Yes	01
No	02
Don't know	98
Refused	99

DH2. Do you remember the month in 2017 when you purchased the dehumidifier?

_____ [ENTER MONTH]

Don't know	98
Refused	99

DH3. Was this dehumidifier purchased: [READ ANSWERS AND RECORD RESPONSE]

To replace a functioning unit	01
To replace a broken unit	02
Not a replacement	03
Don't know	98
Refused	99

DH4. [ASK IF Q29 = 02] Why didn't you repair the broken unit?

Too costly	01
Too much time involved	02
Wanted to change style	03
Don't know	98
Refused	99

DH5. For the dehumidifier you bought, was it purchased through any of the following retail stores:
[READ LIST, CHECK ALL THAT APPLY]

The Home Depot	01
Lowes Home Improvement	02
Sam's Club	03
Walmart	04
Costco	05
Sears	06
Hartville Hardware	07
Other(Specify)	
Don't know	98
Refused	99

DH6. Did you know [ANSWER U1] provides funds to reduce the price of dehumidifiers purchased at retail stores?

Yes	01
No	02
Don't know	98
Refused	99

[SHOW DH7 TO DH8 IF DH6 = 1]

DH7. How did you learn about the discounted price?

Retail Store Signage	01
Retail Store Employee	02
Utility Marketing	02
Friend/Family	03
TV/Radio/Internet Advertising	04
Other (Specify)	
Don't Know	98

DH8. To the best of your knowledge, was the dehumidifier you purchased in 2017 discounted through your utility?

Yes	01
No	02
Don't know	98
Refused	99

DH9. Please rate, on a scale of 1-5, how satisfied or dissatisfied you are with the dehumidifier you purchased, where 1-Extremely Dissatisfied. 2- Dissatisfied, 3-Neutral, 4- Satisfied, 5-Extremely Satisfied.

_____ [RECORD RESPONSE]

DH10. Have you noticed a difference on your electric bill?

Yes, I've noticed savings	01
No	02
Open Ended	[RECORD RESPONSE]

Room Air Conditioner

[ASK RA1-RA7 IF HE4 = Y]

RA1. What was the make or manufacturer of the room air conditioner you purchased? The make or manufacturer should be listed on the unit.

_____ [RECORD ANSWER]

Don't know 98 [PROMPT TO LOOK AT THE UNIT]

Refused 99

RA2. What is the capacity of the unit in BTUs?

_____ [RECORD ANSWER]

Don't know 98 [PROMPT TO LOOK AT THE UNIT]

Refused 99

RA3. Was the room AC you purchased Energy Star certified?

Yes 01

No 02

Don't know 98

Refused 99

RA4. Which month in 2017 was the air conditioner installed?

_____ [RECORD ANSWER]

Don't know 98

Refused 99

RA5. Was this air conditioner purchased: [READ ANSWERS AND RECORD RESPONSE]

To replace a functioning unit 01 [SKIP TO RA7]

To replace a broken unit 02

Not a replacement 03 [SKIP TO RA7]

Don't know 98 [SKIP TO RA7]

Refused 99 [SKIP TO RA7]

RA6. [ASK IF RA5 = 02] Why didn't you repair the broken unit?

Too costly	01
Too much time involved	02
Wanted to change style	03
Don't know	98
Refused	99

RA7. What did you do with your old unit?

Still have it, not in use	01
Recycled the unit	02
Took it to the dump	03
Sold it for scrap metal	04
Sold for parts	05
Sold or gifted unit to an individual	06
Sold or donated to an organization/company.	07

Company name: _____

Don't know	98
Refused	99

High-Efficiency Central Air Conditioner

[ASK CAC1 THROUGH CAC11 IF HE5 = Y]

CAC1. Which month in 2017 did you purchase the central air conditioning system?

_____ [ENTER MONTH PRODUCT WAS PURCHASED]

Don't know	98
Refused	99

CAC2. Can you tell me the make or manufacturer of the central air conditioning system you purchased? The make or manufacturer should be listed on the outdoor unit.

_____ [ENTER MANUFACTURER OF UNIT]

Don't know	98 [PROMPT TO LOOK AT THE UNIT]
Refused	99

CAC3. Was the central air conditioning system you purchased Energy Star certified?

Yes	01
No	02
Don't know	98
Refused	99

CAC4. What is the capacity of the unit in BTU/hr.?

_____ [RECORD CAPACITY]

Don't know	98 [PROMPT TO LOOK AT THE UNIT]
Refused	99

CAC5. What is the SEER rating of the NEW unit?

_____ [RECORD SEER]

Don't know	98 [PROMPT TO LOOK AT THE UNIT]
Refused	99

CAC6. Do you recall the SEER rating of the OLD unit?

_____ [RECORD SEER]

Don't know	98
Refused	99

[ASK CAC7 IF CAC6 = 98 OR CAC6=99]

CAC7. Do you recall the age of the OLD unit?

_____ [RECORD AGE]

Don't know	98
Refused	99

CAC8. Can you tell me the name of the contractor who installed the new unit?

_____ [RECORD CONTRACTOR NAME]

Did not use contractor	01
Don't know	98
Refused	99

CAC9. Was this air conditioner purchased: [READ ANSWERS AND RECORD RESPONSE]

To replace a functioning unit	01
To replace a broken unit	02
Not a replacement	03
Don't know	98
Refused	99

CAC10. [ASK IF CAC9 = 02] Why didn't you repair the broken unit?

Too costly	01
Too much time involved	02
Wanted to change style	03
Don't know	98
Refused	99

CAC11. What did you do with your old unit?

Still have it, not in use	01
Recycled the Unit	02
Took it to the dump	03
Sold it for scrap metal	04
Sold for parts	05
Sold or gifted unit to an individual	06
Sold or donated to an organization/company.	07

Company name: _____

Don't know	98
Refused	99

Heat Pump

[ASK HP1 – HP9 IF HE6 = Y]

HP1. Which month in 2017 did you purchase the heat pump?

_____ [ENTER MONTH PRODUCT WAS PURCHASED]

Don't know 98

Refused 99

HP2. Can you tell me the make or manufacturer of the heat pump you purchased?

_____ [ENTER MANUFACTURER OF UNIT]

Don't know 98 [PROMPT TO LOOK AT THE UNIT]

Refused 99

HP3. Was the Heat Pump you purchased Energy Star certified?

Yes 01

No 02

Don't know 98

Refused 99

HP4. What is the capacity of the unit in BTU/hr.?

_____ [RECORD CAPACITY]

Don't know 98 [PROMPT TO LOOK AT THE UNIT]

Refused 99

HP5. What is the SEER rating of the NEW unit?

_____ [RECORD SEER]

Don't know 98 [PROMPT TO LOOK AT THE UNIT]

Refused 99

HP6. Do you recall the SEER rating of the OLD unit?

_____ [RECORD SEER]

Don't know	98
Refused	99

[ASK HP7 IF HP6 = 98 OR HP6=99]

HP7. Do you recall the age of the OLD unit?

_____ [RECORD AGE]

Don't know	98
Refused	99

HP8. Can you tell me the name of the contractor who installed the new unit?

_____ [RECORD CONTRACTOR NAME]

Did not use contractor	01
Don't know	98
Refused	99

HP9. Was this Heat Pump purchased: [READ ANSWERS AND RECORD RESPONSE]

To replace a functioning unit	01
To replace a broken unit	02
Not a replacement	03
Don't know	98
Refused	99

Mini-Split Heat Pump

[ASK MSP1 – MSP9 IF HE7 = Y]

MSP1. Which month in 2017 did you purchase the mini-split heat pump?

_____ [ENTER MONTH PRODUCT WAS PURCHASED]

Don't know	98
Refused	99

MSP2. Can you tell me the make or manufacturer of the mini-split heat pump you purchased?

_____	[ENTER MANUFACTURER OF UNIT]	
Don't know		98 [PROMPT TO LOOK AT THE UNIT]
Refused		99

MSP3. Was the Heat Pump you purchased Energy Star certified?

Yes	01
No	02
Don't know	98
Refused	99

MSP4. What is the capacity of the unit in BTU/hr.?

_____	[RECORD CAPACITY]	
Don't know		98 [PROMPT TO LOOK AT THE UNIT]
Refused		99

MSP5. What is the SEER rating of the NEW unit?

_____	[RECORD SEER]	
Don't know		98 [PROMPT TO LOOK AT THE UNIT]
Refused		99

MSP6. Do you recall the SEER rating of the OLD unit?

_____	[RECORD SEER]	
Don't know		98
Refused		99

[ASK MSP7 IF MSP6 = 98 OR MSP6 =99]

MSP7. Do you recall the age of the OLD unit?

_____	[RECORD AGE]	
Don't know		98
Refused		99

MSP8. Can you tell me the name of the contractor who installed the new unit?

_____ [RECORD CONTRACTOR NAME]

Did not use contractor	01
Don't know	98
Refused	99

MSP9. Was this Heat Pump purchased: [READ ANSWERS AND RECORD RESPONSE]

To replace a functioning unit	01
To replace a broken unit	02
Not a replacement	03
Don't know	98
Refused	99

Household Electronics

HE. Since January 1, 2017, have you purchased or had installed ANY of the following items in your home/residence: Computer, Digital Imaging or Printers, Computer Monitor, a TV less than 40 inches, or a TV that is 40 inches or larger?

Q.	Appliance	Yes	No	DK	REF
HE1	Computer				
HE2	Computer Monitor				
HE3	Imaging or printers				
HE4	TV, less than 40 inches				
HE5	TV, 40 inches or larger				

[ASK CMP1 – CMP7 IF HE1 = Y]

Computers

CMP1. Are you currently using the computer you purchased?

Yes	01
No	02
Don't know	98
Refused	99

CMP2. For the computer you bought, was it purchased through any of the following retail stores:
[READ LIST, CHECK ALL THAT APPLY]

Sam's Club	03
Walmart	04
Costco	05
Sears	06
Best Buy	07
Other (Specify)	
Don't know	98
Refused	99

CMP3. Did you know [ANSWER Q2] provides funds to promote energy efficient computers purchased at retail stores?

Yes	01
No	02
Don't know	98
Refused	99

[SHOW CMP4 to CMP5 if CMP3 = 1]

CMP4. How did you learn about the promotion?

Retail Store Signage	01
Retail Store Employee	02
Utility Marketing	03
Friend/Family	04
TV/Radio/Internet Advertising	05
Other (Specify)	

Don't Know	98
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CMP5. To the best of your knowledge, was the computer you purchased in 2017 promoted through your utility?

Yes	01
No	02
Don't know	98
Refused	99

CMP6. Please rate, on a scale of 1-5, how satisfied or dissatisfied you are with the computer you purchased, where 1-Extremely Dissatisfied. 2- Dissatisfied, 3-neutral, 4- Satisfied, 5-Extremely Satisfied.

_____ [RECORD RESPONSE]

[ASK CM1 – CM6 IF HE2 = Y]

Computer Monitors

CM1.Are you currently using the computer monitor you purchased?

Yes	01
No	02
Don't know	98
Refused	99

CM2. For the computer monitor you bought, was it purchased through any of the following retail stores: [READ LIST, CHECK ALL THAT APPLY]

Sam's Club	03
Walmart	04
Costco	05
Sears	06
Best Buy	07
Other (Specify)	08
Don't know	98
Refused	99

CM3. Did you know [ANSWER U1] provides funds to promote energy efficient computer monitors purchased at retail stores?

Yes	01
No	02
Don't know	98
Refused	99

[SHOW CM4 to CM5 if CM3 = 1]

CM4. How did you learn about the promotion?

Retail Store Signage	01
Retail Store Employee	02
Utility Marketing	03
Friend/Family	04
TV/Radio/Internet Advertising	05
Other (Specify)	
Don't Know	98

CM5. To the best of your knowledge, was the computer monitor you purchased in 2017 promoted through your utility?

Yes	01
No	02
Don't know	98
Refused	99

CM6. Please rate, on a scale of 1-5, how satisfied or dissatisfied you are with the computer monitor you purchased, where 1-Extremely Dissatisfied. 2- Dissatisfied, 3-neutral, 4- Satisfied, 5-Extremely Satisfied.

_____ [RECORD RESPONSE]

[ASK IPS1 – IPS6 IF HE3 = Y]

Imaging, printers and scanners

IPS1. Are you still using the printer or other imaging device you purchased?

Yes	01
No	02
Don't know	98
Refused	99

IPS2. For the printer or other imaging device you bought, was it purchased through any of the following retail stores: [READ LIST, CHECK ALL THAT APPLY]

Sam's Club	03
Walmart	04
Costco	05
Sears	06
Best Buy	07
Other (Specify)	
Don't know	98
Refused	99

IPS3. Did you know [ANSWER Q2] provides funds to promote energy efficient imaging devices purchased at retail stores?

Yes	01
No	02
Don't know	98
Refused	99

[SHOW IPS4 to IPS5 if IPS3 = 1]

IPS4. How did you learn about the promotion?

Retail Store Signage	01
Retail Store Employee	02
Utility Marketing	03
Friend/Family	04

TV/Radio/Internet Advertising	05
Other (Specify)	
Don't Know	98

IPS5. To the best of your knowledge, was the printer or imaging device you purchased in 2017 promoted through your utility?

Yes	01
No	02
Don't know	98
Refused	99

IPS6. Please rate, on a scale of 1-5, how satisfied or dissatisfied you are with the printer or imaging device you purchased, where 1-Extremely Dissatisfied. 2- Dissatisfied, 3-neutral, 4-Satisfied, 5-Extremely Satisfied.

_____ [RECORD RESPONSE]

[ASK STV1 – STV6 IF HE4 = Y]

TV's less than 40"

STV1. Did you install the TV smaller than 40 inches you purchased?

Yes	01
No	02
Don't know	98
Refused	99

STV2. For the TV smaller than 40 inches you bought, was it purchased through any of the following retail stores: [READ LIST, CHECK ALL THAT APPLY]

Sam's Club	03
Walmart	04
Costco	05
Sears	06
Best Buy	07
Other(Specify)	08

Don't know	98
Refused	99

STV3. Did you know [ANSWER U1] provides funds to promote energy efficient TVs purchased at retail stores?

Yes	01
No	02
Don't know	98
Refused	99

[SHOW STV4 to STV5 if STV3 = 1]

STV4. How did you become aware of the promotion?

Retail Store Signage	01
Retail Store Employee	02
Utility Marketing	03
Friend/Family	04
TV/Radio/Internet Advertising	05
Other(Specify)	
Don't Know	98

STV5. To the best of your knowledge, was the TV you purchased in 2017 promoted through your utility?

Yes	01
No	02
Don't know	98
Refused	99

STV6. Please rate, on a scale of 1-5, how satisfied or dissatisfied you are with the TV fixtures you purchased, where 1-Extremely Dissatisfied. 2- Dissatisfied, 3-neutral, 4- Satisfied, 5-Extremely Satisfied.

_____ [RECORD RESPONSE]

[ASK LTV1 – LTV6 IF HE5 = Y]

TV's 40" or greater

LTV1. Did you install the TV 40 inches or greater you purchased?

Yes	01
No	02
Don't know	98
Refused	99

LTV2. For the TV 40 inches or greater, was it purchased through any of the following retail stores:
[READ LIST, CHECK ALL THAT APPLY]

Sam's Club	03
Walmart	04
Costco	05
Sears	06
Best Buy	07
Other(Specify)	
Don't know	98
Refused	99

LTV3. Did you know [ANSWER U1] provides funds to promote energy efficient TVs purchased at retail stores?

Yes	01
No	02
Don't know	98
Refused	99

[SHOW LTV4 TO LTV5 IF LTV3 = 1]

LTV4. How did you learn about the promotion?

Retail Store Signage	01
Retail Store Employee	02
Utility Marketing	03

Friend/Family	04
TV/Radio/Internet Advertising	05
Other(Specify)	
Don't Know	98

LTV5. To the best of your knowledge, was the TV you purchased in 2017 promoted through your utility?

Yes	01
No	02
Don't know	98
Refused	99

LTV6. Please rate, on a scale of 1-5, how satisfied or dissatisfied you are with the TV you purchased, where 1-Extremely Dissatisfied. 2- Dissatisfied, 3-neutral, 4- Satisfied, 5-Extremely Satisfied.

_____ [RECORD RESPONSE]

Smart Thermostat

ST1. Did you purchase a Smart Thermostat in 2017? Smart thermostat models include Nest, ecobee, Honeywell, LUX, and Emerson models.

Yes	01
No	02
Don't know	98
Refused	99

[ASK ST2 – ST9 IF ST1 = 01]

ST2. Did you install the Smart Thermostat you purchased?

Yes	01
No	02
Don't know	98
Refused	99

ST3. Please rate, on a scale of 1-5, how satisfied or dissatisfied you are with the smart thermostat you purchased, where 1-Extremely Dissatisfied. 2- Dissatisfied, 3-neutral, 4- Satisfied, 5-Extremely Satisfied.

_____ [RECORD RESPONSE]

ST4. Have you noticed a difference on your electric bill?

Yes, I've noticed savings 01

No 02

Open Ended [RECORD RESPONSE]

ST5. What kind of AC unit do you have?

Room Air Conditioner 01

Central AC 02

Heat Pump 03

Mini-Split Heat Pump 04

Don't know 98

Refused 99

ST6. What kind of heating unit do you have?

Electric Furnace 01

Gas Furnace 02

Heat Pump 03

Don't know 98

Refused 99

[ASK ST7 IF ST9 = 98 OR ST10=99]

ST7. Do you recall the SEER rating of the unit?

_____ [RECORD SEER]

Don't know 98

Refused 99

ST8. Do you recall the age of the unit?

_____ [RECORD AGE]

Don't know	98
Refused	99

ST9. What type of thermostat is your Smart Thermostat replacing?

Manual	01
Programmable	02
Don't know	98
Refused	99

Household Characteristics / Demographics

Please answer the following questions about the house, apartment, or mobile home you reside in.

HC1. Which best describes this building? Include all apartments, flats, etc., even if vacant.

A mobile home	01
A one-family house detached from any other house	02
A one-family house attached to one or more houses	03
A building with 2 apartments	04
A building with 3 or 4 apartments	05
A building with 5 to 9 apartments	06
A building with 10 to 19 apartments	07
A building with 20 to 49 apartments	08
A building with 50 or more apartments	09
Boat, RV, van, etc.	10
Don't know	98
Refused	99

HC2. Please select one of the following. Is this house, apartment, or mobile home-

Owned by you or someone in this household with a mortgage or loan? Include home equity loans.	01
Owned by you or someone in this household free	

and clear (without a mortgage or loan)?	02
Rented	03
Occupied without payment of rent?	04
Don't know	98
Refused	99

HC3. About when was this building first built?[DO NOT READ]

2000 or later -Specify year XXXX	01
1990 to 1999	02
1980 to 1989	03
1970 to 1979	04
1960 to 1969	05
1950 to 1959	06
1940 to 1949	07
1939 or Earlier	08
Don't know	98
Refused	99

HC4. Approximately how many square feet is your home?

_____ Record Number [100-99999]

Don't know	98
Refused	99

HC5. How many separate rooms are there in this house, apartment or mobile home?

Include bedrooms, kitchens, etc.

Exclude bathrooms, porches, foyers, halls or unfinished basements.

_____ Record Number [1-97]

Don't know	98
Refused	99

HC6. How many of those rooms are bedrooms?

Count as bedrooms those rooms you would list if this house, apartment, or mobile home were for sale or rent. If this is an efficiency/studio apartment, print "0".

_____ Record Number [1-97]

Don't know	98
Refused	99

HC7. How many people are living or staying at this address?

Include everyone who is living or staying here for more than 2 months.

Include yourself if you are living or staying here for more than 2 months.

Include anyone else staying here who does not have another place to stay, even if they are here for less than two months.

Do not include anyone who is living somewhere else for more than two months, such as a college student living away or someone in the Armed Forces on deployment.

_____ Record Number [1-97]

Don't know	98
Refused	99

HC7. When did the person who owns or leases this house, apartment or mobile home move in?
Please provide a month and year

Month XX Year XXXX

Don't know	98
Refused	99

HC8. Which FUEL is used MOST for heating this house, apartment, or mobile home?

Gas: from underground pipes serving the neighborhood	01
Gas: stored liquid petroleum gas (propane/butane)	02
Electricity	03
Fuel oil, kerosene, etc.	04
Coal	05
Wood	06
Solar energy	07
Other fuel	08

No fuel used	09
Don't know	98
Refused	99

HC9. In the past 12 months, what was the cost in dollars of oil, coal, kerosene, wood, etc., for this house, apartment, or mobile home? If you have lived here less than 12 months, estimate the cost.

\$_____ Record Number [100-99999]	
Don't know	98
Refused	99

HC11. What is your approximate total household income? [READ CATEGORIES]

Less than \$10,000	01
\$10,000 to \$29,999	02
\$30,000 to \$49,999	03
\$50,000 to \$69,999	04
\$70,000 to \$89,999	05
\$90,000 to \$99,999	06
\$100,000 to \$149,999	07
\$150,000 or more	08
Don't know	98
Refused	99

Customer Information:

CI1. Thank you for your time in answering questions regarding lighting and appliance purchases in Ohio. We have finished with the questions for this survey. Upon verification that you are a customer of FirstEnergy's Ohio utilities, we would like to mail you a \$5 Walmart gift card for your participation. To do that I'll need your mailing information at this time. You can expect to receive the gift card in 4-6 weeks.

Are you willing to provide your name and the address so we can mail the gift card?

Name:

Address:

CI2. Would you allow us to contact you again to schedule a household visit to document the energy saving measures you described? You would receive an additional \$20 Walmart gift card for participating in this part of the study.

Yes	01
No	02
Don't know	98
Refused	99

[IF CI2 = Yes, SHOW CI3]

CI3. What day of the week and time would work best for you?

Day

Time

Don't Know/Refused.

If you have any questions regarding this survey or would like to check on the status of your \$5 gift card, please call 775-345-3031. Once again thank you for participating in this survey regarding household lighting and appliance purchases in Ohio. Have a great day.