2013 Evaluation of Mercantile Customer Program

Evaluation Report

Prepared for the FirstEnergy Ohio Companies:

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1. Executive Summary

The Ohio operating companies The Cleveland Electric Illuminating Company ("CEI"), Ohio Edison Company ("OE"), and The Toledo Edison Company ("TE") (collectively "Companies"), continued the Mercantile Customer Program during 2013. This report presents the results of the impact and process evaluations of the Mercantile Customer Program activity occurring during 2013.

The main features of the approach used for the evaluation are as follows:

- Data for the study were collected through review of program materials, on-site inspections, end-use metering, and interviews with the Companies' staff members, participating customers and contractors. Based on data provided by the Companies a sample design was developed for on-site data collection. Samples were drawn that provide savings estimates for each program providing energy savings estimation with ±10% statistical precision at the 90% confidence level. Table 1-1 shows the sample sizes for different types of data collection methods employed for this study.
- On-site visits were used to collect data for savings impact calculations, to verify measure installation, and to determine measure operating parameters. Facility staff were interviewed to determine the operating hours of installed systems and to locate any additional benefits or shortcomings with the installed systems. For many of these sites, energy efficient equipment was monitored in order to obtain accurate information on equipment operating characteristics. The 17 projects, for which on-site measurements and verification data were collected, account for approximately 53% of the expected kWh savings.
- Customer surveys provided information for the process evaluation. A total of 31 customer decision makers were interviewed. Additionally, relevant Company staff members were interviewed.

Table 1-1 Sample Sizes for Data Collection Efforts

Type of Data Collected	*Sample Size*
On-Site Measurement and Verification	17
Customer Decision Maker Survey	31

Gross savings were estimated using proven techniques, including industry standard engineering calculations and verification of computer simulations developed to determine energy savings.

The realized energy savings of the 2013 Mercantile Customer Program from the three service territories are summarized in Table 1-2. For the entire program, the realized gross energy savings totaled 80,546,308 kWh. The gross realization rate for the program is 81%.

Table 1-2. Summary of kWh Savings for Mercantile Customer Program

Operating Company	*Rate Code*	*Ex Ante kWh Savings*	*Ex Post kWh Savings*	*Realization Rate*
CEI	GP	317,838	152,736	48%
	GS	23,041,796	18,323,021	80%
	GT	762,477	769,287	101%
	TRF	117,590	56,508	48%
Total		24,239,701	19,301,551	80%
OE	GP	1,954,500	1,456,347	75%
	GS	10,273,973	8,156,413	79%
	GSU	4,760,982	2,354,130	49%
	GT	16,140,057	12,978,915	80%
Total		33,129,512	24,945,805	75%
TE	GP	5,255,243	4,031,454	77%
	GS	9,216,935	8,418,047	91%
	GT	27,072,884	23,822,172	88%
	STL	56,765	27,278	48%
Total		41,601,827	36,298,952	87%
Grand Total		98,971,040	80,546,308	81%

The realized gross peak kW reductions of the 2013 Mercantile Customer Program from the three service territories are summarized in Table 1-3. The achieved peak demand savings for the program are 8,982.70 kW. The gross realization rate for the program is 83%.

Table 1-3. Summary of Peak kW Savings for Mercantile Customer Program

Operating Company	*Rate Code*	*Ex Ante Peak kW Savings*	*Ex Post Peak kW Savings*	*Realization Rate*
CEI	GP	48.00	39.04	81%
	GS	2,701.00	2,214.06	82%
	GT	78.00	45.70	59%
	TRF	12.00	9.76	81%
Total		2,839.00	2,308.56	81%
OE	GP	411.00	349.83	85%
	GS	869.50	693.76	80%
	GSU	964.50	136.06	14%
	GT	1,662.00	1,912.96	115%
Total		3,907.00	3,092.61	79%
TE	GP	685.00	430.94	63%
	GS	357.00	334.39	94%
	GT	2,968.00	2,805.63	95%
	STL	13.00	10.57	81%
Total		4,023.00	3,581.53	89%
Grand Total		10,769.00	8,982.70	83%

The interviews and surveys that were conducted provided a perspective on program operations and effectiveness during 2013. The following presents a selection of key conclusions from 2013:

- **Customers Satisfied With Program Overall:** Customers were satisfied with their overall experience with the program. A large number of customers were satisfied with the steps needed to get through the program. Customers were least satisfied with the application approval time and the amount of time it took to receive their rebate.
- **Positive Interactions with Program Staff:** Nearly all survey respondents who interacted with program staff found them to be knowledgeable. Participants were also satisfied with the thoroughness and promptness of responses from program staff members.
- **Administrators Receive Strong Support from Program Staff:** The program staff strives to maintain strong relationships with Administrator organizations. Administrators educate and market the program among their respective customers. The training provided to Administrators under the Mercantile Customer Program is aimed at keeping Administrators up to date on program changes—regulatory and otherwise. The program staff also provides Administrators with monthly spreadsheets that contain status updates of all their applications in the queue. The Administrators found these spreadsheets to be very useful.
- **Program Primarily Promoted by Administrators and the Companies' Customer Service Representatives:** Given that the Mercantile Customer Program is a self-direct program, it requires less marketing than other programs. However, the program is promoted primarily by Administrator organizations and the Companies' Customer Service Representatives. Administrators have direct contact with customers. They promote the program with customers on the phone and in person. They also distribute electronic and printed materials to customers regarding the program. Some also speak about the program in public forums.

  The Companies' Customer Service Representatives promote the Mercantile Customer Program and the website also promotes program awareness.
- **Quality Control Issues Typically Resolved By Administrator Organizations:** For applications submitted by Administrators, quality control functions are primarily the responsibility of that particular Administrator organization. The Companies' primary role in quality control is the reviewing of applications for completeness, consistency and to ensure that the proper documentation has been provided to substantiate the claimed savings. However, when other issues arise, the applications are typically forwarded back to Administrators to resolve, as they are being compensated to perform this service. Administrators and Companies' staff members report that there have not been any major issues with quality control. If minor issues arise, the Companies request that the appropriate Administrator organization resolve the issues.

The following recommendations are offered to support ongoing program improvements:

- **Provide Documentation to Alert Customers of Their Rider Exemption Status:** Although the cash rebate option was most popular during this program cycle, some customers have chosen the rider exemption option. However, customers are often distrustful of the rider exemption option because they are unable to see the immediate effect, as with the cash rebate option. Staff from Administrator organizations indicated that customers who chose the rider exemption option were often uncertain that they were actually retaining the benefits because there was no documentation of it. Program staff should consider incorporating notification of receipt of the rider exemption into the process.
- **Focus Trainings On Completion of Paperwork:** The current training for Administrators is more aligned towards Administrators who have previous experience with the program. The current trainings are heavily focused on program changes, updates, and regulatory requirements. Some of individuals from the Administrator organizations felt that the training was adequate for those who had experience with the Mercantile Customer Program, but that they were less useful for newer staff at the Administrator organizations. Individuals who undertook new roles in their Administrator organizations and had little experience with the program often felt unprepared to complete the application spreadsheets, for example. Addressing these knowledge gaps with new staff should help improve the quality of the application materials submitted. To this end, the Companies should consider emphasizing that Administrators ensure that new staff receives training that is either provided by the Companies or by Administrator staff who are familiar with the program.

2. Introduction and Purpose of Study

This report presents the results of the impact and process evaluations of the Mercantile Customer Program for activity during the 2013 program year.

2.1 Overview of Evaluation Approach

The overall objective for the impact evaluation of the Mercantile Customer Program was to verify the gross energy savings and peak demand (kW) reduction resulting from participation in the program during the 2013 program year.

The approach for the impact evaluation had the following main features.

- Available documentation (e.g., audit reports, savings calculation work papers, etc.) was reviewed for a sample of projects, with particular attention given to the calculation procedures and documentation for savings estimates.
- On-site data collection was conducted for a sample of projects to provide the information needed for estimating savings and demand reductions. Monitoring was also conducted at some sites to obtain more accurate information on the hours of operation for lighting, HVAC equipment, and motors/VFDs.
- Gross savings were estimated using proven techniques:
  - Analysis of lighting savings was accomplished using ADM's custom-designed lighting evaluation model with system parameters (fixture wattage, operating characteristics, etc.) based on information on operating parameters collected on-site and, if appropriate, industry standards.
  - For HVAC measures, the original analyses used to calculate the expected savings were reviewed and the operating and structural parameters of the analysis were verified. For custom measures or relatively more complex measures, simulations with the DOE-2 energy analysis model were used to develop estimates of energy use and savings from the installed measures.
- A customer survey was conducted on a sample of program participants to gather information on their decision making and their likes and dislikes of the program.

3. Description of Program

Since 2009, the Companies have implemented the Mercantile Customer Program in Ohio.

On July 17, 2013 the Public Utilities Commission of Ohio ordered that the Mercantile Pilot Program be permanently adopted, explaining that the Pilot for mercantile customers has fulfilled its goal of developing a simplified application filing and approval process.

To be eligible to participate in the Mercantile Customer Program, a customer had to be a "mercantile customer" as defined in R.C. § 4928.01 (A) (19). According to this definition, a mercantile customer is a commercial or industrial customer who meets either of two criteria:

- Consumes more than 700,000 kWh per year; or
- Is part of a national account involving multiple facilities in one or more states.

The Mercantile Customer Program is targeted at mercantile customers that have implemented projects in the last 3 calendar years that resulted in energy efficiency and/or peak demand reductions.

Under Rule 4901:1-39-05(F), Ohio Administrative Code (O.A.C.), a mercantile customer is allowed to file with the Public Utilities Commission of Ohio (PUCO), either individually or jointly with an electric utility, an application to commit the customer's existing demand reduction, demand response, and energy efficiency programs for integration with the electric utility's programs.

Beginning in December, 2010, mercantile customers who participated in the program chose between two types of incentives:

- An exemption from the Demand Side Energy Efficiency (DSE2) Rider established by SB 221, for a specified period of time, or
- A cash rebate option.

A customer participating in the program may have chosen to receive an exemption from the DSE2 Rider. To be eligible for either of these incentive options, a customer was required to provide sufficient data to illustrate that the customer installed self-directed energy efficiency and/or demand reduction technologies that produced energy savings and/or peak demand savings.

Calculations for exemption from the DSE2 rider are made on a site-by-site basis, where a site is defined as a location with one or more facilities located on one or more parcels of land, provided that the parcels are contiguous (e.g., a plant, hospital complex, or university located on one or more contiguous parcels of land would qualify as a site). This is the Companies' definition and is not determined by Commission rules.

Although all accounts related to a given site were eligible for exemption, the exemption was applied only to those accounts identified by a customer on the Joint Application it files with the Company to the PUCO. Aggregate savings from projects on the site were compared to the aggregate baseline of all accounts included in the application to determine if the site met the eligibility requirement.

Under the Cash Rebate Option that was introduced for the Mercantile Pilot Program, customers were eligible to receive a cash rebate for a mercantile customer project discounted to 75 percent of the rebate for the same project if offered by a utility program. The rebates per project were capped at 50 percent of project costs or $250,000, whichever was lower. The maximum rebate that any customer could have received was $500,000 per year. The caps apply per service territory. A customer is defined by its tax identification number.

Several criteria were used to determine energy efficiency project incentive levels under the Mercantile Customer Program.

- If a customer replaced equipment before its end of life, efficiency savings were eligible as measured against the as-found equipment.
- If a customer replaced equipment at end of life with standard equipment, projects were not eligible for an incentive; however, utilities may count the savings as compared to as-found towards compliance goals, and the customer is eligible for a Commitment Payment.[1]
- Behavioral modifications, or operational improvements could have qualified for incentives, but only if an investment was made on the customer's part and if the savings are measurable and verifiable. If there was no investment, the customer was not eligible for an incentive; however, utilities may count measureable and verifiable savings towards compliance goals, regardless of customer incentive level.
- Even though a customer may not receive an incentive for a behavioral modification or a replacement on failure to standard, they may receive instead a commitment payment so that utilities may commit those savings towards compliance.

Expected energy savings were calculated using methodologies outlined in the Ohio Technical Reference Manual (TRM), or using industry standard engineering calculations.

The expected gross savings by measure type are shown in Table 3-1. There were 170 dockets in the program which were expected to provide savings of 98,971,040 kWh. Figure 3-1 shows the program’s ex post kWh savings by date of implementation.

[1] The commitment payment is not an incentive but rather intended to offset the administrative costs of filing an applications. Case No. 10-834-EL-POR, September 15, 2010 Entry.

Table 3-1 Ex Ante Annual Energy Savings of the Mercantile Customer Program

Operating Company	*Ex Ante kWh Savings*
CEI	24,239,701
OE	33,129,512
TE	41,601,827
Total Companies	98,971,040

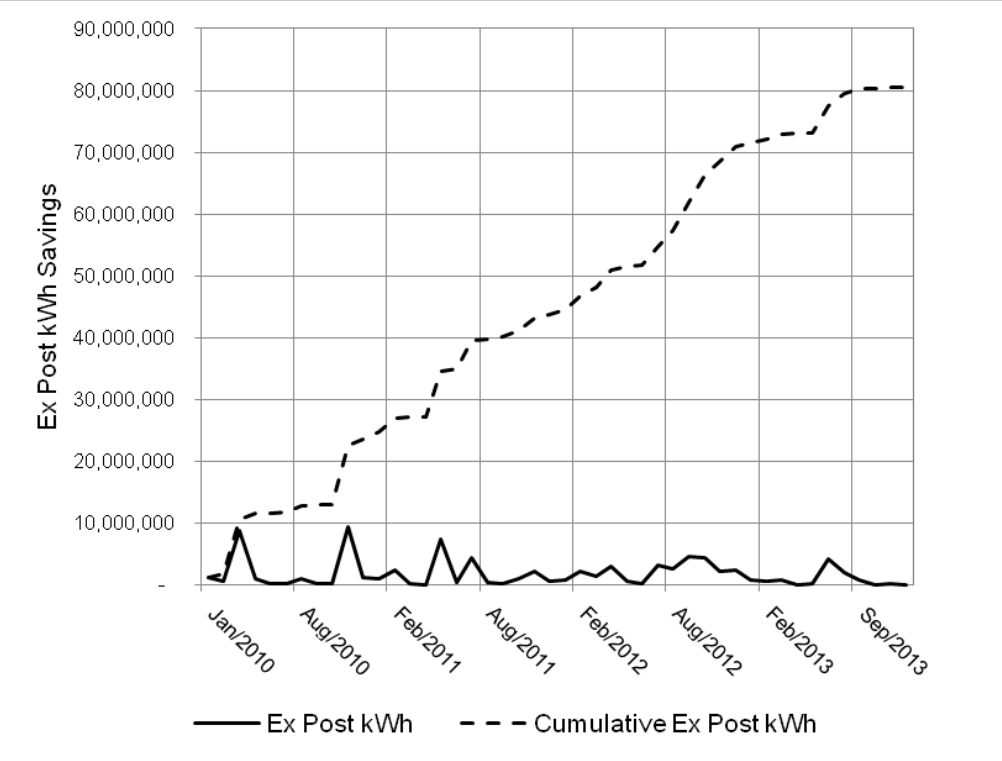

Figure 3-1. Mercantile Customer Program Realized Savings by Implementation Date

4. Methodology

ADM's evaluation of the 2013 Mercantile Customer Program consisted of both an impact evaluation and a process evaluation. The impact methodology is described in section 4.1 and the process evaluation is described in section 4.2 of this chapter.

4.1 Impact Evaluation Methodology

The methodology used for estimating gross savings is described in this section.

4.1.1 Sampling Plan

Data used to estimate the gross savings achieved through the Mercantile Customer Program were collected for samples of projects completed during the 2013 program year. Data provided by the Companies program staff showed that during 2013, there were 170 dockets associated with the program, which were expected to provide savings of 98,971,040 kWh annually.

Inspection of the data on kWh savings for individual projects, provided by the Company program staff, indicated that the distribution of savings was generally positively skewed, with a relatively small number of projects accounting for a high percentage of the estimated savings. Estimation of savings for each program is based on a ratio estimation procedure, which allows precision/confidence requirements to be met with a smaller sample size. ADM selected a sample with a sufficient number of projects to estimate the total achieved savings with 10% precision at 90% confidence. For the sample, the actual precision is ±8%.

Sampling for the collection of program M&V data accounted for the M&V effort occurring in real time during program implementation. Completed projects accumulate over time as the program is implemented, and sample selection was thus spread over the entire program year. ADM used a near real-time process whereby a portion of the sample was selected periodically as projects in the program were completed. The timing of sample selection was contingent upon the timing of the completion of projects during the program year.

Table 4-1 presents the number of projects and expected energy savings of the sampled projects by stratum.

Table 4-1 Population Statistics Used for Sample Design for Mercantile Customer Program.

	Stratum 1	*Stratum 2*	*Stratum 3*	*Stratum 4*	*Stratum 5*	*Totals*
Strata boundaries (kWh)	< 109,670	109,670 – 401,471	401,472 – 856,281	856,282 – 2,108,554	2,108,555 – 17,214,000	
Number of projects	79	45	20	19	7	170
Total kWh savings	4,287,051	10,038,871	12,394,879	29,194,541	43,055,698	98,971,040
Average kWh Savings	54,266	223,086	619,744	1,536,555	6,150,814	582,183
Standard deviation of kWh savings	26,180	90,106	130,919	352,566	5,259,430	1,597,270
Coefficient of variation	0.48	0.40	0.21	0.23	0.86	2.74
Final design sample	2	2	2	4	7	17

As shown in Table 4-2, the sample projects account for approximately 53% of the expected kWh savings.

Table 4-2.Expected kWh Savings for Sampled Projects by Stratum

Stratum	*Ex Ante kWh Savings (Population)*	*Ex Ante kWh Savings (Sample)*	*Percent of Ex Ante Peak kWh Savings in Sample*
5	43,055,698	43,055,698	100%
4	29,194,541	7,505,371	26%
3	12,394,879	1,090,231	9%
2	10,038,871	599,234	6%
1	4,287,051	121,911	3%
Total	98,971,040	52,372,445	53%

As shown in Table 4-3, the sample projects account for approximately 47% of the expected peak kW savings.

Table 4-3 Expected Peak Demand kW Savings for Sampled Projects by Stratum

Stratum	*Ex Ante Peak kW Savings (Population)*	*Ex Ante Peak kW Savings (Sample)*	*Percent of Ex Ante Peak kW Savings in Sample*
5	3,602.00	3,602.00	100%
4	4,076.00	1,089.00	27%
3	1,019.00	226.00	22%
2	1,372.00	91.00	7%
1	700.00	7.00	1%
Total	10,769.00	5,015.00	47%

4.1.2 Review of Documentation

After the samples of projects were selected, the Companies' program staff provided documentation pertaining to the projects. The first step in the evaluation effort was to review this documentation and other program materials that were relevant to the evaluation effort.

For each project, the available documentation (e.g., audit reports, savings calculation work papers, etc.) for each rebated measure was reviewed, with particular attention given to the calculation procedures and documentation for savings estimates. Documentation that was reviewed for all projects selected for the sample included program forms, data bases, reports, billing system data, weather data, and any other potentially useful data. Each application was reviewed to determine whether the following types of information had been provided:

- Documentation for the equipment changed, including (1) descriptions, (2) schematics, (3) performance data, and (4) other supporting information
- Documentation for the new equipment installed, including (1) descriptions, (2) schematics, (3) performance data, and (4) other supporting information
- Information about the savings calculation methodology, including (1) what methodology was used, (2) specifications of assumptions and sources for these specifications, and (3) correctness of calculations

If there was uncertainty regarding a project, or apparently incomplete project documentation, ADM staff contacted the Company program staff to seek further information to ensure the development of an appropriate project-specific M&V plan.

4.1.3 On-Site Data Collection Procedures

On-site visits were completed to collect data that were used in calculating savings impacts. The visits to the sites of the sampled projects collected primary data on the facilities participating in the program.

When projects were selected for the M&V sample, ADM notified the Companies in two ways:

1) Customer Service Representatives (CSR), which were assigned to sites, were provided with a list of all sites for which ADM attempted to schedule M&V activities. This list includes the company name, the respective CSR for the customer, the site address or other premise identification, as well as the respective contact information for the customer representative ADM intended to contact in order to schedule an appointment.
2) ADM provided the Companies' Energy Efficiency and Demand Response EM&V staff with a list of projects for which ADM planned to schedule M&V activities. This notification also served as a request for any documentation relating to the projects. This list included the company name, the PUCO docket, the site address or other

premise identification, and the respective contact information for the customer representative ADM intended to contact in order to schedule an appointment.

Typically, for customers with CSRs, notification was provided at least two weeks prior to ADM contacting customers in order to schedule M&V visits. Upon CSR request, ADM coordinated its scheduling and M&V activities with the CSR.

During the on-site visits, the ADM field staff accomplished three major tasks:

- First, they verified the implementation status of all measures for which customers received incentives. They verified that the energy efficiency measures were indeed installed, that they were installed correctly and that they still functioned properly.
- Second, they collected the physical data needed to analyze the energy savings that have been realized from the installed improvements and measures. Data were collected using a form that was prepared specifically for the project in question after an in-house review of the project file.
- Third, they interviewed the contact personnel at a facility to obtain additional information on the installed system to complement the data collected from other sources.

At some sites, monitoring was conducted to gather more information on the operating hours of the installed measures. Monitoring was conducted at sites where it was judged that the monitored data would be useful for further refinement and higher accuracy of savings calculations. Monitoring was not considered necessary for sites where project documentation allowed for sufficiently detailed calculations.

4.1.4 Procedures for Estimating Savings from Measures Installed through the Mercantile Customer Program

The method ADM employs to determine gross savings impacts depends on the types of measures being analyzed. Categories of measures include the following:

- Lighting
- HVAC
- Motors
- VFDs
- Compressed-Air
- Refrigeration
- Process Improvements

ADM uses a specific set of methods to determine gross savings for projects that depend on the type of measure being analyzed. These typical methods are summarized in Table 4-4.

Table 4-4 Typical Methods to Determine Savings for Custom Measures

Type of Measure	*Method to Determine Savings*
Compressed Air Systems	Engineering analysis, with monitored data on load factor and schedule of operation
Lighting	Custom-designed lighting evaluation model, which uses data on wattages before and after installation of measures and hours-of-use data from field monitoring.
HVAC (including packaged units, chillers, cooling towers, controls/EMS)	eQUEST model using DOE-2 as its analytical engine for estimating HVAC loads and calibrated with site-level billing data to establish a benchmark.
Motors and VFDs	Measurements of power and run-time obtained through monitoring
Refrigeration	Simulations with EQuest engineering analysis model, with monitored data
Process Improvements	Engineering analysis, with monitored data on load factor and schedule of operation

The activities specified produced two estimates of gross savings for each sample project: an expected gross savings estimate (as provided by the customer) and the verified gross savings estimates developed through the M&V procedures employed by ADM. ADM developed estimates of program-level gross savings by applying a ratio estimation procedure in which achieved savings rates estimated for the sample projects were applied to the program-level expected savings.

Energy savings realization rates[2] were calculated for each project for which on-site data collection and engineering analysis/building simulations are conducted. Sites with relatively high or low realization rates were further analyzed to determine the reasons for the discrepancy between expected and realized energy savings.

The following discussion describes the basic procedures used for estimating savings from various measure types.

Plan for Analyzing Savings from Lighting Measures: Lighting measures examined include retrofits of existing fixtures, lamps and/or ballasts with energy efficient fixtures, lamps and/or ballasts. These types of measures reduce demand, while not affecting operating hours. Any proposed lighting control strategies are examined that might include the addition of energy conserving control technologies such as motion sensors or daylighting controls. These measures typically involve a reduction in hours of operation and/or lower current passing through the fixtures.

[2]The savings realization rate for a project is calculated as the ratio of the achieved savings for the project (ex post) (as measured and verified through the M&V effort) to the expected savings (ex ante) (as determined through the project application procedure and recorded in the tracking system for the program).

Analyzing the savings from such lighting measures requires data for retrofitted fixtures on (1) wattages before and after retrofit and (2) hours of operation before and after the retrofit. Fixture wattages are taken from a table of standard wattages, with corrections made for non-operating fixtures. Hours of operation are determined from metered data collected after measure installation for a sample of fixtures.

To determine baseline and post-retrofit demand values for the lighting efficiency measures, ADM uses in-house data on standard wattages of lighting fixtures and ballasts to determine demand values for lighting fixtures. These data provide information on wattages for common lamp and ballast combinations.

As noted, ADM collects data with which to determine average operating hours for retrofitted fixtures by using Time-of-Use (TOU) data loggers to monitor a sample of "last points of control" for unique usage areas in the sites where lighting efficiency measures have been installed. Usage areas are defined to be those areas within a facility that are expected to have comparable average operating hours. For industrial customers, expected usage areas include fabrication areas, clean rooms, office space, hallways/stairways, and storage areas. Typical usage areas are designated in the forms used for data collection.

ADM uses per-fixture baseline demand, retrofit demand, and appropriate post-retrofit operating hours to calculate peak demand savings and annual energy savings for sampled fixtures of each usage type.

The on-off profile and the fixture wattages are used to calculate post-retrofit kWh usage. Peak fixture demand is calculated by dividing the total fixture kWh usage during the Companies' peak period by the number of hours in the peak period.

Peak period demand savings are calculated as the difference between peak period baseline demand and post-installation peak period demand of the affected lighting equipment, per the following formula:

$$\text{Peak Demand Savings} = kW_{\text{Before}} - KW_{\text{After}}$$

The baseline and post-installation average demands are calculated by dividing the total kWh usage during the Peak Period by the number of hours in the Peak Period.

ADM calculates annual energy savings for each sampled fixture per the following formula:

$$\text{Annual Energy Savings} = kWh_{\text{Before}} - kWh_{\text{After}}$$

The values for insertion in this formula are determined through the following steps:

1) Results from the monitored sample are used to calculate the average operating hours of the metered lights in each costing period for every unique building type/usage area.
2) These average operating hours are then applied to the baseline and post-installation average demand for each usage area to calculate the respective energy usage and peak period demand for each usage area.

3) The annual baseline energy usage is the sum of the baseline kWh consumption in all of the usage areas. The post-retrofit energy usage is calculated similarly. The energy savings are calculated as the difference between baseline and post-installation energy usage.

4) Savings from lighting measures in conditioned spaces are factored by region-specific and building type-specific heating cooling interaction factors, allowing for the calculation of total savings attributable to lighting measures, inclusive of impacts on HVAC operation.

Plan for Analyzing Savings from HVAC Measures: Savings estimates for HVAC measures installed at a facility are derived by using the energy use estimates developed through DOE-2 simulations and engineering calculations. Each simulation produces estimates of HVAC energy and demand usage to be expected under different assumptions about equipment and/or construction conditions. There may be cases in which DOE-2 simulation is inappropriate because data are not available to properly calibrate a simulation model, and engineering analysis provides more accurate M&V results.

For the analysis of HVAC measures, the data collected through on-site visits and monitoring are utilized. Using these data, ADM prepares estimates of the energy savings for the energy efficient equipment and measures installed in each of the participant facilities. Engineering staff develop independent estimates of the savings through engineering calculations or through simulations with energy analysis models. By using energy simulations for the analysis, the energy use associated with the end use affected by the measure(s) being analyzed can be quantified. With these quantities in hand, it is a simple matter to determine what the energy use would have been without the measure(s).

Before making the analytical runs for each site with sampled project HVAC measures, engineering staff prepare a model calibration run. This is a base case simulation to ensure that the energy use estimates from the simulations have been reconciled against actual data on the building's energy use. This run is based on the information collected in an on-site visit pertaining to types of equipment, their efficiencies and capacities, and their operating profiles. Current operating schedules are used for this simulation, as are local (TMY) weather data covering the study period. The model calibration run is made using actual weather data for a time period corresponding to the available billing data for the site.

The goal of the model calibration effort is to have the results of the DOE-2 simulation come within approximately 10% of the patterns and magnitude of the energy use observed in the billing data history. In some cases, it may not be possible to achieve this calibration goal because of idiosyncrasies of particular facilities (e.g., multiple buildings, discontinuous occupancy patterns, etc.).

Once the analysis model has been calibrated for a particular facility, ADM performs three steps in calculating estimates of energy savings for HVAC measures installed or to be installed at the facility.

- First, an analysis of energy use at a facility under the assumption that the energy efficiency measures are not installed is performed.
- Second, energy use at the facility with all conditions the same but with the energy efficiency measures now installed is analyzed.
- Third, the results of the analyses from the preceding steps are compared to determine the energy savings attributable to the energy efficiency measure.

Plan for Analyzing Savings from Motors: Estimates of the energy savings from use of high efficiency motors on HVAC and non-HVAC applications are derived through an "after-only" analysis. With this method, energy use is measured only for the high efficiency motor and only after it has been installed. The data thus collected are then used in estimating what energy use would have been for the motor application *if the high efficiency motor had not been installed.* In effect, the after-only analysis is a reversal of the usual design calculation used to estimate the savings that would result from installing a high efficiency motor. That is, at the design stage, the question addressed is how would energy use change for an application if an high efficiency motor is installed, whereas the after-only analysis addresses what the level of energy use would have been had the high efficiency motor not been installed.

For the “after only” analysis, it is not possible to use a comparison of direct measurements to determine savings, since measured data are collected only for the high efficiency motor. However, savings attributable to installation of the high efficiency motor can be estimated using information on the efficiencies of the high efficiency motor and on the motor it replaced. In particular, demand and energy savings can be calculated as follows:

$$\text{Peak Demand Savings} = kW_{peak} \times (1/Eff_{old} - 1/Eff_{new})$$

where kW_{peak} = Volts x $Amps_{peak}$ x Power Factor, and $Amps_{peak}$ is the interval with the maximum recorded Amps during the monitoring period

$$\text{Energy Savings} = kW_{ave} \times (1/Eff_{old} - 1/Eff_{new}) \times \text{Hours of use}$$

where kW_{ave} = Volts x $Amps_{ave}$ x Power Factor and $Amps_{ave}$ is the average measured Amps for the duration of the monitored period.

$$\text{Annual Energy Savings} = kW_{ave} \times (1/Eff_{old} - 1/Eff_{new}) \times (\text{days of operation per year/ days metered}) \times \text{Annual Adjustment Factor}$$

where kW_{ave} = Volts x $Amps_{ave}$ x Power Factor for the monitoring period, $Amps_{ave}$ is the average measured Amps for the duration of the monitored period, and use factor is determined from interviews with site personnel.

Annual Adjustment Factor is 1 if the monitoring period is typical for the yearly operation, less than 1 if the monitoring period is expected to be higher use than typical for the rest

of the year, and more than 1 if the monitoring period is expected to be lower than typical for the rest of the year.[3]

The information on motor efficiencies needed for the calculation of savings is obtained from different sources.

Data on the efficiencies of high efficiency motors installed under the program should be available from program records.

Care must be taken using nameplate efficiency ratings of replaced motors, unless the company maintains good documentation of their equipment. If a motor has been rewound it may not operate as originally rated. However, if the efficiencies of the old motors are not directly available, the efficiency values can be imputed by using published data on average efficiency values for motors of given horsepower. Based on rules established under the Commission's Mercantile Pilot Program, Docket No. 10-834-EL-EEC, utilities may count equipment of failure to as-found conditions.

Because most motors monitored run only under full load conditions, some adjustments must be made from the "industry averages" of full load efficiencies. Motor efficiency curves of typical real motors that have the same full load efficiencies are used for determining part load efficiencies.

Like motor efficiency, the power factor varies with motor loading. Motor power factor curves of typical real motors that have the same full load power factor are used for determining part load power factor.

Another factor to consider in demand and energy savings comparisons of motor change-out programs is the rotor slip. Full load RPM ratings of motors vary. For centrifugal loads, such as fans and pumps, the power supplied is dependent on the speed of the driven equipment. The power is theoretically proportional to the cube of the speed, but in practice acts more like the square of the speed. In general high efficiency motors have slightly higher full load RPM ratings (lower slip) than standard motors. Where nameplate ratings of full load RPM are available for replaced motors, a derating factor can be applied.[4]

The data needed to carry out these plans for determining savings are collected from several sources.

- The first source of data is the information from each project's documentation. This information is expected to include aggregate energy used at a site, disaggregated energy usage data for certain targeted processes (if available), before (actual) and after (projected) data on production, scrap, and other key performance indicators, and

[3] Current year weather data were compared with the *Typical Meteorological Year* from the National Oceanic & Atmospheric Administration (NOAA)

[4] As an example, take the case where a new motor has a full load RPM rating of 1770 and the old motor had a full load RPM rating of 1760. The derating factor would be:

Derating factor = $(RPM_{old})^2 / (RPM_{new})^2 = 1760^2 / 1770^2 = 0.989$

final reports (which include process improvement recommendations, analyses, conclusions, performance targets, etc.).

- The second source of data is the energy use data that the Companies collect for these customers.
- The third source is information collected through on-site inspections of the facilities. ADM staff collects the data during on-site visits using a form that is comprehensive in addressing a facility's characteristics, its modes and schedules of operation, and its electrical and mechanical systems. The form also addresses various energy efficiency measures, including high efficiency lighting (both lamps and ballasts), lighting occupancy sensors, lighting dimmers and controls, air conditioning, high efficiency motors, etc.
- As a fourth source of data, selected end-use equipment are monitored to develop information on operating schedules and power draws.

Plan for Analyzing Savings from VFDs: A variable-frequency drive (VFD) is an electronic device that controls the speed of a motor by varying the magnitude of the voltage, current, or frequency of the electric power supplied to the motor. The factors that make a motor load a suitable application for a VFD are (1) variable speed requirements and (2) high annual operating hours. The interplay of these two factors can be summarized by information on the motor's duty cycle, which essentially shows the percentage of time during the year that the motor operates at different speeds. The duty cycle should show good variability in speed requirements, with the motor operating at reduced speed a high percentage of the time.

Potential energy savings from the use of VFDs are usually most significant with variable-torque loads, which have been estimated to account for 50% to 60% of total motor energy use in the non-residential sectors. Energy saving VFDs may be found on fans, centrifugal pumps, centrifugal blowers, and other centrifugal loads, most usually where the duty cycle of the process provided a wide range of speeds of operation.

ADM's approach to determining savings from installation of VFDs involves (1) making one-time measurements of voltage, current, and power factor of the VFD/motor and (2) conducting continuous measurements of amperage over a period of time in order to obtain the data needed to develop VFD load profiles and calculate demand and energy savings. VFDs are generally used in applications where motor loading changes as motor speed changes. Consequently the true power drawn by a VFD is recorded in order to develop VFD load shapes. One-time measurements of power are made for different percent speed settings. Power and percent speed or frequency (depending on VFD display options) are recorded for as wide a range of speeds as the customer allows the process to be controlled; field staff attempt to obtain readings from 40 to 100% speed in 10 to 15% increments.

Plan for Analyzing Savings from Compressed Air Measures: Measures to improve the efficiency of a compressed air system include the reduction of air leaks, resizing of

compressors, installing more efficient compressors, improved controls, or a complete system redesign. Savings from such measures are evaluated through engineering analysis of compressor performance curves, supported by data collected through short-term metering.

ADM field staff obtains nameplate information for the pre-retrofit equipment either from the project file or during the on-site survey. Performance curve data are obtained from manufacturers. Engineering staff then conduct an engineering analysis of the performance characteristics of the pre-retrofit equipment. During the on-site survey, field staff inspects the as-built system equipment, take pressure and load readings, and interview the system operator to identify seasonal variations in load. Potential interactions with other compressors are assessed and it is verified that the rebated compressor is being operated as intended.

When appropriate, short-term measurements are performed to reduce the uncertainty in defining the load on the as-built system. These measurements may be taken either with a multi-channel logger, which can record true power for several compressors, with current loggers, which can provide average amperage values, or with motor loggers to record operating hours. The appropriate metering equipment is selected by taking into account variability in load and the cost of conducting the monitoring.

Plan for Analyzing Savings from Refrigeration and Process Improvements: Analysis of savings from refrigeration and process improvements is inherently project-specific. Because of the specificity of processes, analyzing the processes through simulations is generally not feasible. Rather, reliance is made on engineering analysis of the process affected by the improvements. Major factors in ADM's engineering analysis of process savings are operating schedules and load factors. Information on these factors is developed through short-term monitoring of the affected equipment, be it pumps, heaters, compressors, etc. The monitoring is done after the process change, and the data gathered on operating hours and load factors are used in the engineering analysis to define "before" conditions for the analysis of savings.

4.2 Process Evaluation Methodology

The purpose of the process evaluation is to examine program operations and results throughout the program operating year, and to identify potential program improvements that may prospectively increase program efficiency and any potential administrative issues. This process evaluation was designed to document the operations and delivery of the Mercantile Customer Program during the 2013 program year.

Key research questions to be addressed by this evaluation of 2013 activity include:

Was the Mercantile Customer Program delivery effective and successful?

Are there areas of the Mercantile Customer Program administration that could be improved?

During the evaluation, data and information from multiple sources were analyzed to achieve the stated research objectives including program documentation and surveys. Insight into the customer experience with the Mercantile Customer Programs was developed from an online and telephone survey of program participants.

5. Detailed Evaluation Findings

This chapter reports ADM's impact evaluation findings and process evaluation findings for the 2013 Mercantile Customer Program.

5.1 Impact Evaluation Findings

This section provides the results of gross savings for the Mercantile Customer Program during the 2013 Program year.

5.1.1 Realized Gross kWh Savings

The gross kWh savings of the 2013 Mercantile Customer Program are summarized by sampling stratum in Table 5-1. Overall, the achieved gross savings of 80,546,308 kWh were equal to 81% of the expected savings. Table 5-2 shows the expected and realized energy savings by project.

Table 5-1.Expected and Gross Realized kWh Savings for Mercantile Customer Program by Sample Stratum

Stratum	*Ex Ante kWh Savings*	*Ex Post kWh Savings*	*Realization Rate*
5	43,055,698	38,184,364	89%
4	29,194,541	21,233,367	73%
3	12,394,879	12,505,579	101%
2	10,038,871	4,824,148	48%
1	4,287,051	3,798,850	89%
Total	98,971,040	80,546,308	81%

Table 5-2.Expected and Gross Realized kWh Savings for the Mercantile Customer Program

PUCO Docket ID	*Ex Ante kWh Savings*	*Ex Post kWh Savings*	*Realization Rate*
13-0055	543,233	568,619	105%
13-0071	2,178,223	1,277,979	59%
13-0087	25,009	3,317	13%
13-0153	1,454,961	1,508,380	104%
13-0276	7,638,201	6,907,265	90%
13-0330	341,308	144,407	42%
13-0440	257,926	143,553	56%
13-0575	546,998	531,349	97%
13-0949	2,936,762	2,034,308	69%
13-1171	96,902	104,711	108%
13-1346	5,706,868	5,822,442	102%
13-1540	2,108,554	377,135	18%
13-1574	2,041,211	1,695,761	83%
13-1709	2,476,044	2,114,127	85%
13-1882	1,900,645	1,877,426	99%

PUCO Docket ID	Ex Ante kWh Savings	Ex Post kWh Savings	Realization Rate
13-2019	17,214,000	17,233,817	100%
13-2147	4,905,600	2,794,426	57%
Non-Sample Dockets	46,598,595	35,407,286	76%
Total	98,971,040	80,546,308	81%

Gross realized kWh savings of the Mercantile Equipment Program are shown by building type in Table 5-3. Among discrete building types, primary metal manufacturing facilities account for the largest percentage of incentive gross energy – 21.4%.

Table 5-3. Realized Gross kWh Savings for Mercantile Customer Program by Facility Type

Facility Type	Ex Post kWh Savings	Percent of Total Ex Post kWh Savings
Primary Metal Manufacturing	17,233,817	21.4%
Transportation Equipment Manufacturing	9,581,411	11.9%
Other	7,544,992	9.4%
Computer and Electronic Product Manufacturing	5,965,995	7.4%
Educational Services	4,536,876	5.6%
Hospitals	4,282,371	5.3%
Plastics and Rubber Products Manufacturing	3,835,576	4.8%
Nonmetallic Mineral Product Manufacturing	2,794,426	3.5%
Utilities	2,250,464	2.8%
General Merchandise Stores	2,203,320	2.7%
Health and Personal Care Stores	1,967,344	2.4%
Telecommunications	1,943,042	2.4%
Nursing and Residential Care Facilities	1,877,426	2.3%
Fabricated Metal Product Manufacturing	1,761,986	2.2%
Food Manufacturing	1,733,351	2.2%
Chemical Manufacturing	1,690,113	2.1%
Transit and Ground Passenger Transportation	1,345,740	1.7%
Insurance Carriers and Related Activities	1,324,924	1.6%
Machinery Manufacturing	923,718	1.1%
Executive, Legislative, and Other General Government Support	869,439	1.1%
Publishing Industries (except Internet)	769,287	1.0%
Mining (except Oil and Gas)	686,966	0.9%
Food and Beverage Stores	636,032	0.8%
Performing Arts, Spectator Sports, and Related Industries	505,798	0.6%
Construction of Buildings	457,676	0.6%
Electrical Equipment, Appliance, and Component Manufacturing	377,135	0.5%
Credit Intermediation and Related Activities	311,091	0.4%
Motor Vehicle and Parts Dealers	186,351	0.2%
Social Assistance	169,510	0.2%

Facility Type	*Ex Post kWh Savings*	*Percent of Total Ex Post kWh Savings*
Merchant Wholesalers, Durable Goods	149,768	0.2%
Motion Picture and Sound Recording Industries	118,178	0.1%
Museums, Historical Sites, and Similar Institutions	111,419	0.1%
Paper Manufacturing	90,961	0.1%
Justice, Public Order, and Safety Activities	77,384	0.1%
Furniture and Home Furnishings Stores	74,594	0.1%
Support Activities for Transportation	67,298	0.1%
Real Estate	59,404	0.1%
Electronics and Appliance Stores	31,122	0.0%
Grand Total	80,546,308	100.0%

5.1.2 Realized Gross Peak kW Savings

The realized gross peak kW reductions of the 2013 Mercantile Customer Program are shown in Table 5-4. The achieved gross peak demand savings for the program are 8,982.70 kW which is equal to 83% of expected savings.

Table 5-4. Expected and Gross Realized Peak kW Savings for the Mercantile Customer Program

Stratum	*Ex Ante Peak kW Savings*	*Ex Post Peak kW Savings*	*Realization Rate*
5	3,602.00	4,022.62	112%
4	4,076.00	2,178.17	53%
3	1,019.00	597.06	59%
2	1,372.00	1,115.84	81%
1	700.00	1,069.00	153%
Total	10,769.00	8,982.70	83%

5.1.3 Discussion of Gross Savings Analysis

The project realization rates were reviewed to assess whether there were factors that were causing systematic differences in the realization rates. An analysis was conducted to determine whether realization rates for projects differed systematically by expected kWh savings.

Sample project realization rates and expected kWh savings are plotted in Figure 5-1. There is not a strong association between realization rates and expected kWh savings. Figure 5-2 plots the project realized energy savings against the expected energy savings for each sample point.

Case-by-case examination showed that project-specific factors were more likely to cause realized kWh savings to differ from expected savings. Project-specific factors include type of measure implemented, building type, facility operating schedule, and other parameters that may affect energy efficiency measure savings.

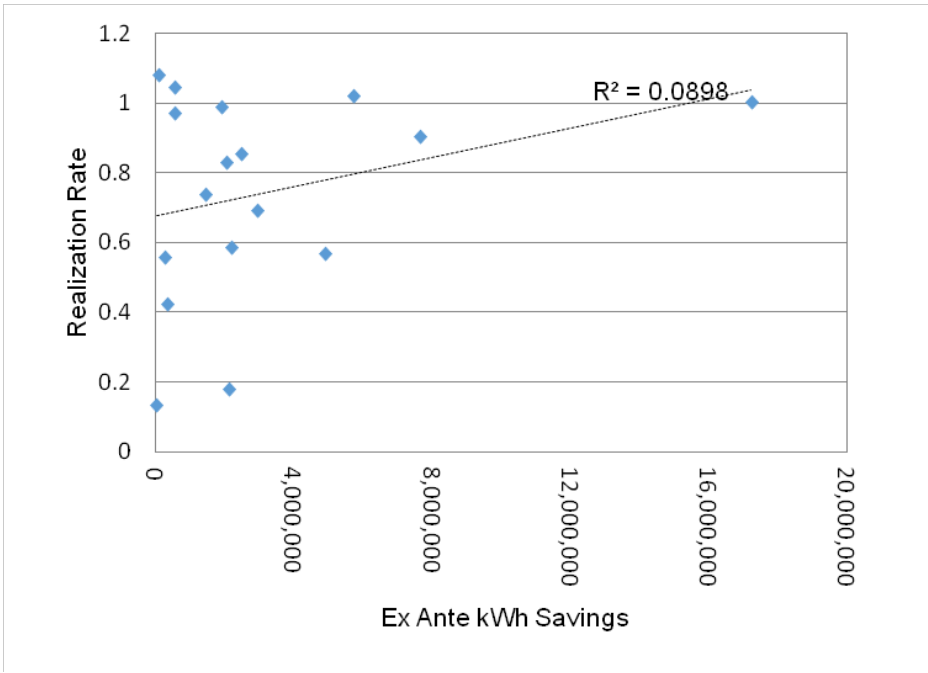

Figure 5-1. Sample Project Realization Rate versus Expected kWh Savings for the Mercantile Customer Program

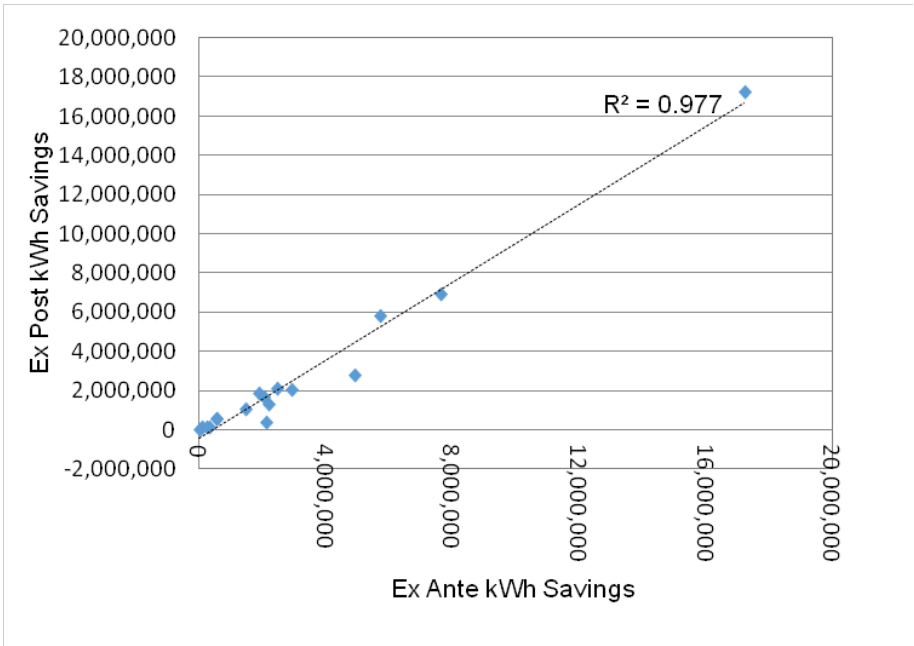

Figure 5-2 Sample Project Ex Post kWh Savings versus Ex Ante kWh Savings for the Mercantile Customer Program

5.2 Process Evaluation Findings

This section presents the results of the process evaluation for the Mercantile Customer Program during the 2013 program year. The process evaluation focuses on the effectiveness of program policies and organization, as well as the program delivery

framework. The purpose of the process evaluation is to assess the design and recent results of the programs in order to determine how effectively it is achieving its intended outcomes. This evaluation is based upon analysis of program structure, interviews and surveys of participating Ohio customers, interviews with program staff, interviews with Administrator organization staff, and program tracking data.

The section begins with a discussion of the overall progress of the program. This section also presents strategic planning and process recommendations, and highlights key findings from the surveys of customer participants, interviews with program operations staff, and interviews with Administrator organization staff.

5.2.1 Summary of Primary Data Collection

- **Participant surveys:** Participant surveys are the primary data source for many components of this process evaluation, and serve as the foundation for understanding the customer perspective. The participant surveys provide customer feedback and insight regarding customer experiences with the Mercantile Customer Program. Respondents report their satisfaction with the programs, detail their motivations and the factors affecting their decision making process, and provide recommendations related to improving the program.

  Online and telephone surveys were administered to program participants. Attempts were made to collect data from all decision makers who implemented projects through the Mercantile Customer Program. In total, interviews were completed with 31 decision makers.

- **Interviews with program staff members:** Interviews with two program staff members provided insight into various aspects of the program and its organization. The program staff members also provide information regarding recent organizational and procedural improvements that have been implemented in order to enhance program efficiency and effectiveness.

- **Interviews with Administrator organizations:** Administrators are third party organizations that educate and market the program among their respective customers. They also assist customers in completing applications. Interviews with Administrators help to gain insight into the application process and to develop a sense of program satisfaction levels. Administrators report their experiences with customers, program marketing strategies, and provide opinions of how the program could be improved. Interviews were conducted with individuals from the nine Administrator associations via telephone.

5.2.2 Summary of Conclusions and Recommendations

The interviews and surveys that were conducted provided a perspective on program operations and effectiveness during 2013. The following presents a selection of key conclusions from 2013:

- **Customers Satisfied With Program Overall:** Customers were satisfied with their overall experience with the program. A large number of customers were satisfied with the steps needed to get through the program. Customers were least satisfied with the application approval time and the amount of time it took to receive their rebate.
- **Positive Interactions with Program Staff:** Nearly all survey respondents who interacted with program staff found them to be knowledgeable. Participants were also satisfied with the thoroughness and promptness of responses from program staff members.
- **Few Problems with Application Process:** Survey respondents were asked a series of questions about the application process and they generally provided a favorable assessment of it. Most survey respondents indicated that the information on how to complete the application forms was mostly or completely clear and 79% found the overall application process to be completely or somewhat acceptable.
- **Administrators Receive Strong Support from Program Staff:** The program staff strives to maintain strong relationships with Administrator organizations. Administrators educate and market the program among their respective customers. The training provided to Administrators under the Mercantile Customer Program is aimed at keeping Administrators up to date on program changes—regulatory and otherwise. The program staff also provides Administrators with monthly spreadsheets that contain status updates of all their applications in the queue. The Administrators found these spreadsheets to be very useful.
- **Program Primarily Promoted by Administrators and the Companies' Customer Service Representatives:** Given that the Mercantile Customer Program is a self-direct program, it requires less marketing than other programs. However, the program is promoted primarily by Administrator organizations and the Companies' Customer Service Representatives. Administrators have direct contact with customers. They promote the program with customers on the phone and in person. They also distribute electronic and printed materials to customers regarding the program. Some also speak about the program in public forums.

  The Companies' Customer Service Representatives promote the Mercantile Customer Program and the website also promotes program awareness.
- **Quality Control Performed by the Companies and Administrator Organizations:** For applications submitted by Administrators, quality control functions are primarily the responsibility of that particular Administrator organization. The Companies' primary role in quality control is the reviewing of applications for completeness, consistency and to ensure that the proper documentation has been provided to substantiate the claimed savings. However, when other issues arise, the applications are typically forwarded back to Administrators to resolve, as they are being compensated to perform this service. Administrators and Companies' staff members report that there have not been any major issues with quality control. If minor issues

arise, the Companies request that the appropriate Administrator organization resolve the issues.

The following recommendations are offered to support ongoing program improvements:

- **Provide Documentation to Alert Customers of Their Rider Exemption Status:** Although the cash rebate option was most popular during this program cycle, some customers have chosen the rider exemption option. However, customers are often distrustful of the rider exemption option because they are unable to see the immediate effect, as with the cash rebate option. Staff from Administrator organizations indicated that customers who chose the rider exemption option were often uncertain that they were actually retaining the benefits because there was no documentation of it. Program staff should consider incorporating notification of receipt of the rider exemption into the process.
- **Focus Trainings More on the Completion of Paperwork:** The current training for Administrators is more aligned towards Administrators who have previous experience with the program. The current trainings are heavily focused on program changes, updates, and regulatory requirements. Some of individuals from the Administrator organizations felt that the training was adequate for those who had experience with the Mercantile Customer Program, but that they were less useful for newer staff at the Administrator organizations. Individuals who undertook new roles in their Administrator organizations and had little experience with the program often felt unprepared to complete the application spreadsheets, for example. Addressing these knowledge gaps with new staff should help improve the quality of the application materials submitted. To this end, the Companies should consider emphasizing that Administrators ensure that new staff receives training that is either provided by the Companies or by Administrator staff who are familiar with the program.

5.2.3 Mercantile Customer Program Participant Outcomes

An online and telephone survey was conducted to collect data about customer decision-making, preferences, and opinions of the Mercantile Customer Program. The program offers a rebate or an exemption from the DSE2 rider for customers who have implemented a variety of measures, including: lighting, HVAC, motors, air compressors, controls, refrigeration, and process improvements. Commercial and industrial customers are eligible to participate if their annual electric usage exceeds 700,000 kWh, or have multiple facilities in one or more states.

As shown in Table *5-5*, the majority of survey respondents were facilities managers and facilities management / maintenance positions.

Table 5-5 Job Titles/Roles of Respondents

	Response	*(n=30)*	*Percent of Respondents*	*Percent of Ex Post kWh*
What is your job title or role?	Facilities Manager	8	27%	6%
	Energy Manager	2	7%	9%
	Other facilities management/maintenance position	7	23%	62%
	Chief Financial Officer	1	3%	1%
	Other financial/administrative position	2	7%	2%
	Proprietor/Owner	0	0%	0%
	President/CEO	0	0%	0%
	Manager	0	0%	0%
	Other	10	33%	20%

5.2.4 How Customers Learn About the Program

Customers were asked how they learned about the Mercantile Customer Program. As shown in Table 5-6, the most common way customers learned about the program was from a key account representative of their EDC. This is most likely due to the program's marketing approach that utilizes customer service representatives as one of the means to promote the program. Approximately 13% of respondents heard about the program from an account service advisor at their EDC or from a program representative or service provider. Six percent or less was aware of the program from past experience with the program or from their EDC's website.

Table 5-6 How Customers Learned about the Mercantile Customer Program

	Response	*(n=31)*	*Percent of Respondents**	*Percent of Ex Post kWh*
How did you learn about [EDC's] Mercantile Program?	Received an informational brochure or newsletter	0	0%	0%
	From an [EDC] Key Account Representative/Account Service Provider	14	45%	64%
	From a program representative or service provider	4	13%	4%
	From [EDC]'s website	1	3%	0%
	TV / radio ad's sponsored by [EDC]	0	0%	0%
	Friends or colleagues	0	0%	0%
	From an architect, engineer or energy consultant	0	0%	0%
	From an equipment vendor or building contractor	0	0%	0%
	Through past experience with the program	2	6%	65%
	Other	7	23%	15%
	Don't know	0	0%	0%

5.2.5 Decision Makers and Decision Making

Figure 5-5 displays participant responses regarding who initiated the decision to participate in the Mercantile Customer Program. Respondents most frequently reported that the decision to participate in the program was initiated by the organization. Another common response was that the idea arose in discussion between the organization and a vendor/contractor. Only a few respondents noted that their vendor or contractor actually initiated the decision to participate in the Mercantile Customer Program.

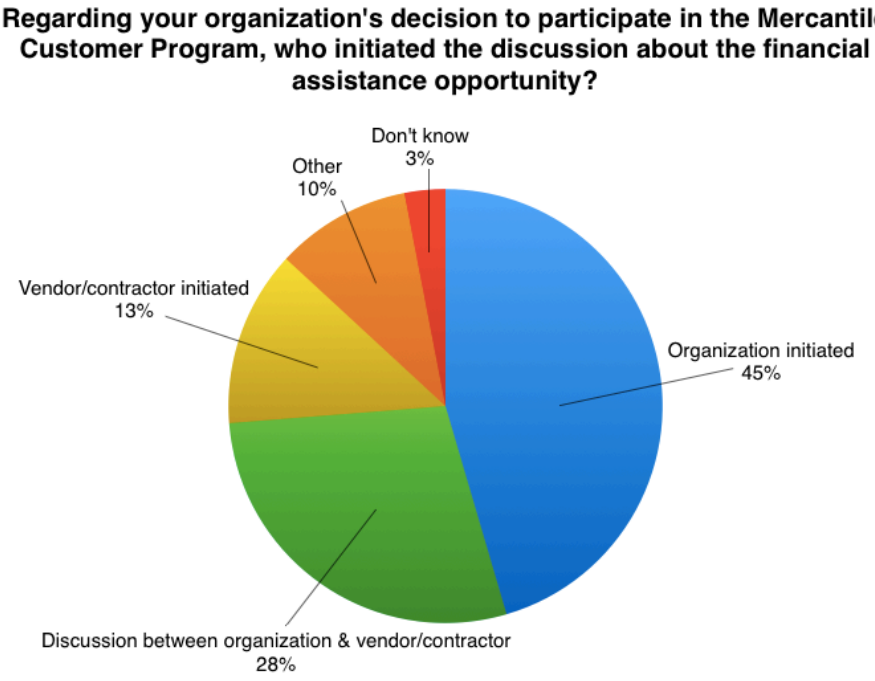

Figure 5-3 Decision Makers

Respondents were asked what types of people were most influential in their decision to implement the energy saving equipment at their organization. Table 5-7 highlights the responses to this question. Utility staff members appear to play the greatest role in affecting decisions to implement energy efficient measures. Approximately 17% of respondents felt that a utility staff member, such as an account representative, had a critical effect on the decision, such that they could not have made the decision without them. An additional 17% felt that utility staff members had a moderate to large effect on their decision. Respondents also felt that vendors and contractors were important to their decision to pursue energy efficiency. Approximately 30% of respondents said that vendors played a moderate to large effect on their decision. Sixteen percent noted that contractors played a moderate to large effect on their decision.

Table 5-7 Influences on Decision Making

How did each of the following types of people affect your decision to implement the energy saving equipment:	*Provided no input*	*Input did not affect decision*	*Small effect on decision*	*Moderate to large effect on decision*	*Critical effect - could not have made decision without it*	*Don't know*	*n*
Vendor	33%	10%	3%	30%	10%	13%	30
Contractor (Installer)	39%	13%	10%	16%	10%	13%	31
Designer or architect	33%	10%	3%	13%	7%	33%	30
Utility staff member, such as an account representative	27%	10%	7%	17%	17%	23%	30

Respondents were asked if there were any other parties that influenced their decision to install the energy efficient equipment. They were also asked how these parties impacted their decision. The following commentary highlights some of their responses:

> *"The State of Ohio…they offered an energy efficiency grant to pay for a portion of the installed system."*
>
> *"PlugSmart Energy Consultants…they informed us of the program and took care of all the paperwork.*

5.2.6 Organizational Goals and Policies

To understand what factors customers consider when deciding to make energy efficiency improvements, we asked about organizational procedures and policies that guide decision making.

Company use of policies and procedures regarding energy efficiency improvements is shown in Table 5-8. Seventy-one percent of respondents' organizations had a person or persons responsible for monitoring or managing energy usage. Almost an equal amount of respondents said that they had defined energy savings goals (42%) and a specific policy requiring that energy efficiency be considered when purchasing equipment. Additionally, over a third of respondents said they had a numeric goal for energy savings. Seven respondents noted that their organizations had carbon reduction goals.

Table 5-8 Policies and Procedures Regarding Energy Efficiency Improvements

	Response	*(n=31)*	*Percent of Respondents*	*Percent of Ex Post kWh*
Which of the following, if any, does your company have in place at [LOCATION] location?	A person or persons responsible for monitoring or managing energy usage	22	71%	84%
	Defined energy savings goals	13	42%	84%
	A specific policy requiring that energy efficiency be considered when purchasing equipment	12	39%	16%
	Carbon reduction goals	7	23%	7%
	Other policies or procedures regarding energy efficiency or use (please describe)	2	6%	1%
	None of the above	4	13%	3%
	Don't know	0	0%	0%

5.2.7 Previous Experiences with EDC Incentive Programs

Respondents were asked if they were aware of other incentive programs, outside of the Mercantile Customer Program, provided by their EDC for energy efficient projects. The vast majority of respondents (87%) were aware of incentive programs offered by their EDC. Only five respondents were unaware of such programs.

The respondents that were aware of their EDC's incentive programs were further asked if they had previously applied for incentives through these programs. Approximately 19 of the 27 (70%) respondents that were aware of the programs had applied for incentives through these programs. Seven respondents (26%) did not previously apply for incentives under these programs.

Respondents who had previously applied for incentives under other EDC programs were asked why they had chosen to participate in the Mercantile Customer Program rather than pursue higher incentives in the other programs. Table 5-9 highlights their reasons. Approximately half (47%) of the respondents stated that the equipment was implemented prior to them learning about the incentive programs. Eighteen percent felt that the financial payoff received through the Mercantile Customer Program was better than any other program. Two respondents noted that other incentive programs were unavailable when the project was planned. Only one individual stated that they were concerned that applying for an incentive would delay their project.

Table 5-9 Reasons for Not Pursuing Other EDC's Incentive Programs for Mercantile Customer Program Projects

	Response	*(n=17)*	*Percent of Respondents*	*Percent of Ex Post kWh*
Why didn't you choose to receive incentives through these programs for the Mercantile Customer Program project?	The equipment was implemented before I learned of the incentive programs	8	47%	11%
	I was concerned that applying for an incentive would delay the project	1	6%	56%
	The financial payoff I received through Mercantile Customer Program was better	3	18%	10%
	The incentive programs were unavailable when the project was planned	2	12%	0%
	Other	5	29%	3%

Respondents who had previous experience with EDC incentive programs were asked how important their participation in those programs was to their decision to implement additional energy efficiency measures. As Figure 5-6 shows, over a third of participants found their participation in EDC incentive programs were not at all important in their choice to implement other energy efficiency equipment or upgrades. However, another one-third noted that the EDC programs were somewhat important.

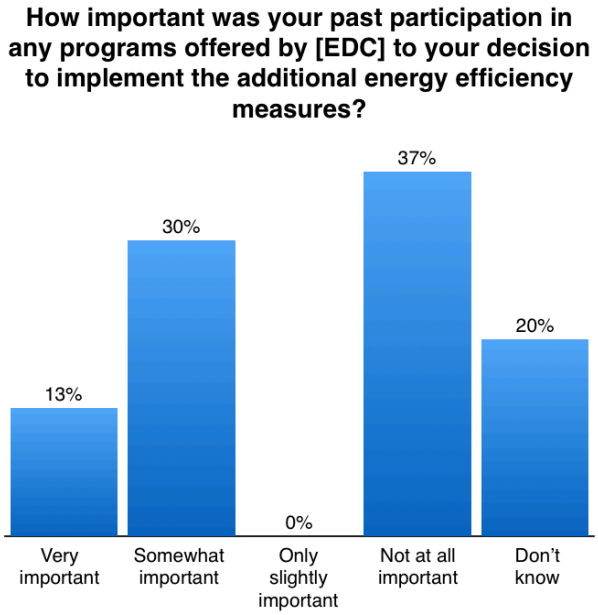

Figure 5-4 Influence of EDC Program Participation on Installation of Additional Measures

5.2.8 Choice of Cash Rebate or Rider Exemption

Mercantile Customer Program participants have the option of selecting either a cash rebate or a rider exemption. Table 5-10 shows the savings associated with projects for which the decision maker selected either the cash rebate or rider exemption. As shown the average project savings were higher for customers who selected the rider exemption and customers with smaller projects tended to select the cash rebate.

Table 5-10 Selection of Cash Rebate and Rider Exemption by Project Ex Post Savings

Ex Post kWh	*Cash Rebate (n=147)*	*Rider Exemption (n=23)*
< 50,000	31%	0%
50,000 to 99,999	34%	30%
100,000 to 499,499	13%	22%
500,000 to 999,999	13%	30%
1,000,000 +	9%	17%
Average Ex Post kWh Savings	431,465	744,391

Most survey respondents received the cash incentive (81%) instead of the rider exemption (16%). One respondent had more than one project and chose to have both the cash rebate and the rider exemption, under different dockets. Participants were asked why they chose one option over the other. Table 5-11 highlights the participants' responses. As displayed in the table, the majority of cash recipients preferred getting a single payment, whereas the majority of customers receiving the rider exemption chose it because it was a better financial payout. Cash recipients also chose that option because the process was easier or because the paperwork was quicker.

Table 5-11 Preferences for Cash Rebate or Rider Exemption Choice

	Response	*Percent of Cash Recipients (n=25)*	*Percent of Rider Exemption Recipients (n=5)*
Why did you choose the [cash rebate/rider exemption] instead of the [rider exemption/cash rebate]? (Select all that apply)	The paperwork was easier	12%	0%
	The process was quicker	20%	0%
	Financial benefit was better	28%	80%
	Preferred getting a single payment	52%	0%
	Other	28%	20%

5.2.9 Administrator Organizations

Administrator organizations educate their membership about the Mercantile Customer Program, assist them with developing energy saving projects, and assist them with completing program paperwork. As shown in Table 5-12, a little under a half of survey respondents reported that they worked with one of the Administrator organizations. Roth Brothers was the organization that survey respondents most frequently worked through. However, it should be noted that Roth Brothers ended their role as Administrators in April 2013. Other Administrators through which customers worked included: the E-Group, the Ohio Hospitals Association, and the Industrial Energy Users of Ohio.

Table 5-12 Administrator Organizations

	Response	*(n=31)*	*Percent of Respondents*	*Percent of Ex Post kWh*
Did you work through one of the following organizations when you applied for the Mercantile Customer Program?	Association of Independent Colleges & Universities	0	0%	0%
	COSE	1	3%	1%
	County Commissioners' Association of Ohio	0	0%	0%
	Industrial Energy Users - Ohio	2	6%	0%
	Ohio Hospitals Association	2	6%	2%
	Ohio Manufacturer's Association	1	3%	1%
	Ohio Schools Council	1	3%	3%
	Roth Brothers*	3	10%	2%
	The E-Group	2	6%	6%
	Utility regional customer service	1	3%	2%
	Did not work with any of these organizations	18	58%	83%

*Roth Brothers ended their role as an Administrator in April 2013.

Respondents who worked with one of these organizations were asked how satisfied they were with that experience. As shown in Figure 5-6, nearly all respondents were very satisfied or satisfied. Only one respondent was neutral on the topic. These findings suggest that from the customer perspective, the use of the Administrator organizations to assist with the application process is generally effective.

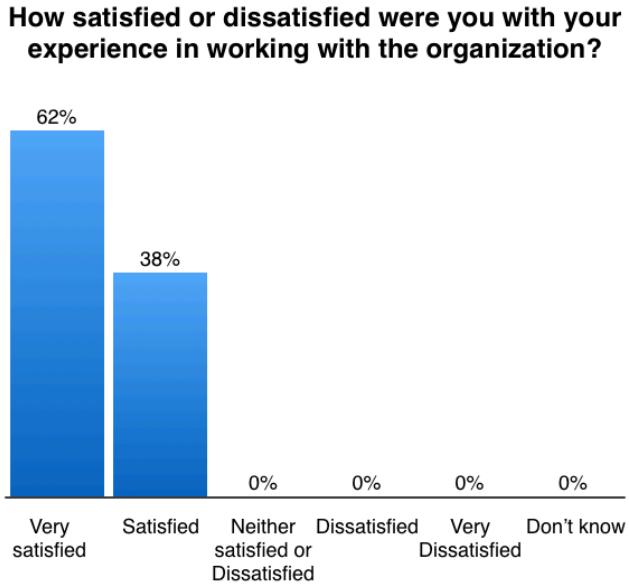

Figure 5-5 Satisfaction with Administrator Organizations

5.2.10 The Program Staff

Program participants were asked to assess the accessibility, knowledge, and overall interactions with the program staff. About one-half of the participants (45%) had some type of interaction with program staff. These respondents were asked to indicate how knowledgeable they felt that the program staff members were about various issues that arose. As can be seen in Table 5-13, the vast majority of respondents who interacted with program staff found the program staff to be very knowledgeable.

Table 5-13 Knowledge of Program Staff

	Response	*(n=13)*	*Percent of Respondents*	*Percent of Ex Post kWh*
On the scale provided, please indicate how knowledgeable were program staff about the issues you discussed with them?	Not at all knowledgeable	0	0%	0%
	Slightly knowledgeable	1	8%	12%
	Somewhat knowledgeable	1	8%	6%
	Fairly knowledgeable	0	0%	0%
	Very knowledgeable	11	85%	82%
	Not sure	0	0%	0%

Respondents were asked about their satisfaction with their interactions with program staff. As demonstrated in Table 5-14, the vast majority of respondents were either very satisfied or satisfied with how long it took program staff to address questions or concerns and how

thoroughly program staff addressed questions or concerns. Only one individual was "dissatisfied" with these components of the program.

Table 5-14 Satisfaction with Program Staff Interactions

Indicate how satisfied or dissatisfied you are with…	*Very satisfied*	*Satisfied*	*Neither dissatisfied nor satisfied*	*Dissatisfied*	*Very dissatisfied*	*Don't know*	*n*
How long it took program staff to address your questions or concerns	64%	21%	7%	7%	0%	0%	13
How thoroughly program staff addressed your questions or concerns	64%	21%	7%	7%	0%	0%	14

5.2.11 The Application Process

Respondents were asked about their experiences with the application process. They were first asked who was responsible for completing the application. As seen in Figure 5-7, the vast majority of respondents (61%) had completed the application themselves. Twenty six percent of respondents noted that a contractor completed the application for their organization. Other parties that completed the application included: another member of the company (19%), equipment vendors (19%), and designer/architects (6%). When asked if they had a clear sense of whom they could go to for assistance with the application process, 84% of respondents responded that they did. Whereas, only two respondents (6%) felt that they did not know who to go to for aid.

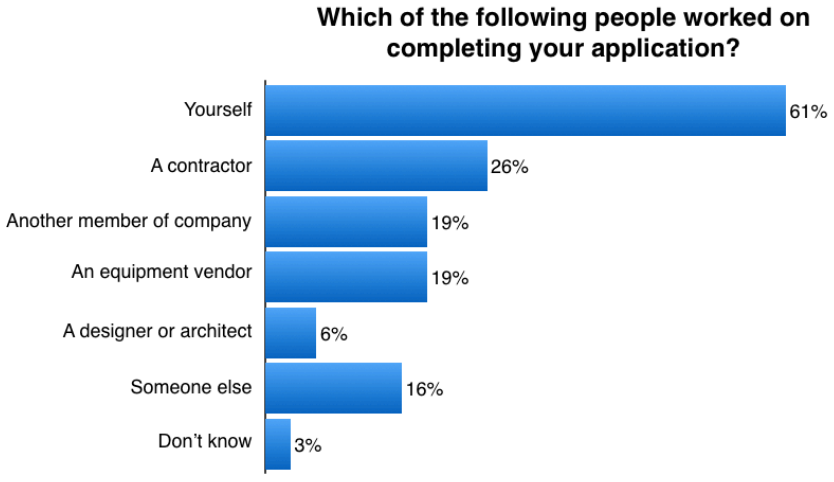

Figure 5-6 Parties Involved In Application Completion

Respondents were asked how they submitted their applications. As seen in Figure 5-8, the vast majority (79%) of respondents submitted their application materials via an email

attachment. Only two respondents (11%) submitted their materials using traditional postal mail.

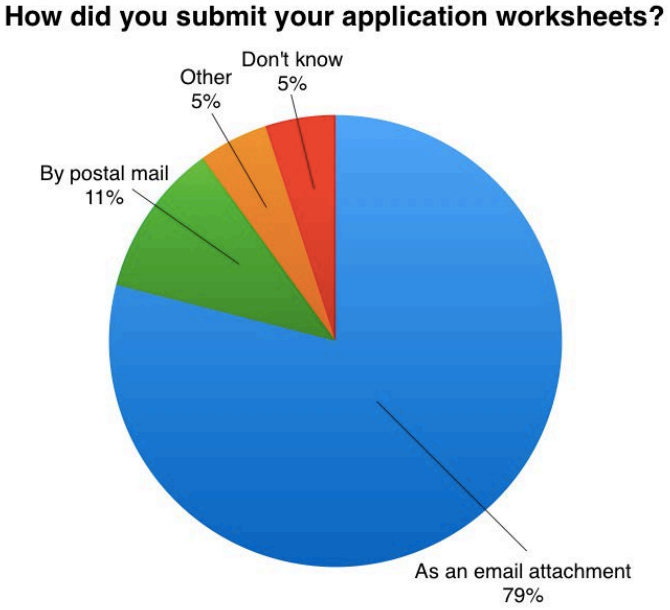

Figure 5-7 Method of Submission for Application

Customers were asked questions about their experience with the application process. Respondents were asked if after their initial submission of the application, whether or not they were required to provide any additional documentation for approval. Fifty-two percent of customers were required to submit additional information before their application was approved. Thirty-two percent of customers were not required to provide any additional information. Respondents who resubmitted applications were asked the reasons for this. Table 5-15 highlights their responses. The vast majority (75%) of customers had to submit additional supporting documentation such as invoices. Another quarter had to resubmit because of issues relating to how energy savings were calculated.

Table 5-15 Reasons for Application Resubmission

	Response	*(n=16)*	*Percent of Respondents*	*Percent of Ex Post kWh*
Which of the following were reasons that you had to resubmit your application? (Select all that apply)	Issues related to how energy savings were calculated	4	25%	48%
	Issues related to additional supporting documentation such as invoices	12	75%	93%
	Other	4	25%	47%
	Don't know	0	0%	0%

Participants were asked to rate the clarity of information they received in the application process regarding specific forms required for approval. As seen in Table 5-16, most of the respondents felt that the information provided on how to complete the program application, the cash rebate forms, as well as the project commitment agreement were

completely or mostly clear. Respondents who reported that some aspects of the application were somewhat clear or not at all clear were asked what information needed to be further clarified. Although most said they did not remember or were not sure, a few provided suggestions. One participant said the entire application process could be clarified, but the Companies staff helped them complete the materials.

Table 5-16 Clarity of Information on How to Complete Forms

Clarity of information on how to complete...	*Completely clear*	*Mostly clear*	*Somewhat clear*	*Not at all clear*	*Don't know*	*n*
Mercantile Customer Program Application	10%	42%	10%	6%	32%	31
Cash Rebate Forms	15%	38%	15%	0%	31%	26
PUCO Application to Commit	13%	32%	16%	0%	39%	31
Mercantile Customer Project Commitment Agreement	13%	39%	10%	0%	39%	31

Respondents were asked to rate various aspects of the application process. As seen in Table 5-17, the most acceptable part of the application process was the effort required to provide required invoices or other supporting documentation. Approximately half of the respondents felt that this aspect of the application process was completely acceptable. Approximately half of the respondents felt that ease of finding how to apply for the Mercantile Customer Program on [EDC]'s website was somewhat acceptable.

Table 5-17 Assessment of Application Process

Rate…	*Completely acceptable*	*Somewhat acceptable*	*Somewhat unacceptable*	*Completely unacceptable*	*Don't know*	*n*
The ease of finding how to apply for the Mercantile Customer Program on [EDC]'s website	32%	53%	0%	0%	16%	19
The ease of using the application forms	37%	42%	11%	5%	5%	19
The effort required to provide required invoices or other supporting documentation	47%	32%	5%	11%	5%	19
The overall application process	32%	47%	21%	0%	0%	19

5.2.12 Purchasing and Installing Equipment

Various questions were used to gauge customers' experiences with purchasing and installing the energy efficient equipment. Approximately one-half of the respondents (45%) worked directly with a retailer to purchase the equipment whereas another half (52%) did not.

As seen in Figure 5-9, respondents were asked to describe the length of their wait for the equipment. Approximately one-third (29%) stated that the equipment was readily available. Approximately 14% of respondents noted that it took between 3-4 weeks or more than 6 weeks to receive their equipment.

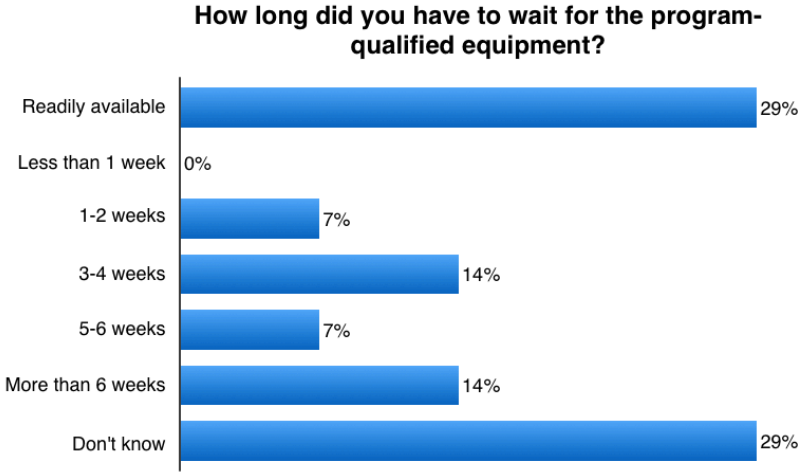

Figure 5-8 Length of Wait for Energy Efficient Equipment

As seen in Figure 5-10, 39% of the equipment or efficiency upgrades was installed by a contractor that the organization worked with in the past. Approximately 35% of the organization's own staff implemented the equipment or upgrades. Only 16% of the respondents noted that their organization used a new contractor that someone else recommended.

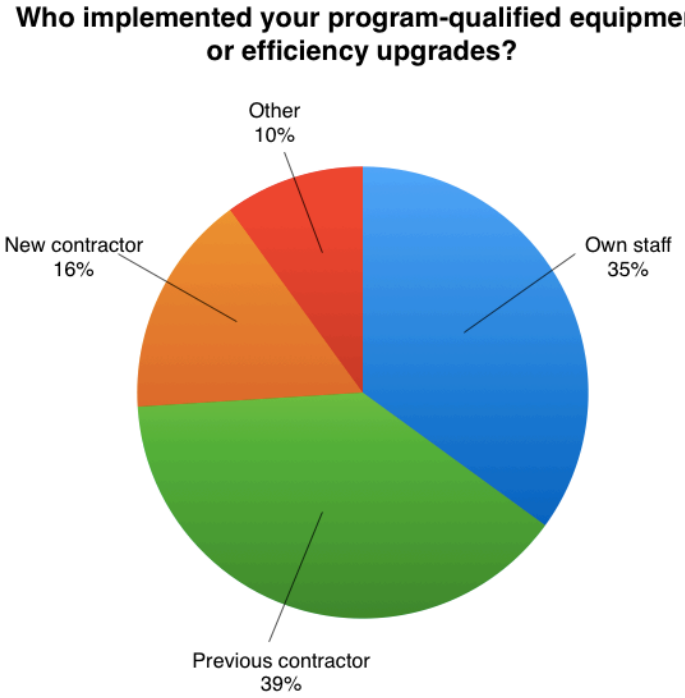

Figure 5-9 Parties Who Installed Equipment or Efficiency Upgrades

As seen in Table 5-18, the vast majority of respondents were satisfied with both the equipment that they received and the quality of implementation of the equipment/energy efficient upgrades. Approximately 94% noted that they were satisfied with the equipment. In addition, 97% stated they were satisfied with the quality of the implementation of such equipment. None of the respondents stated that they were dissatisfied or very dissatisfied with the equipment or installation. All of the respondents noted that the equipment that was implemented was still in place and operating.

Table 5-18 Satisfaction with Equipment & Implementation

Satisfaction element	*Very satisfied*	*Satisfied*	*Neither satisfied nor dissatisfied*	*Dissatisfied*	*Very dissatisfied*	*Not sure*	*n*
Equipment implemented	0%	94%	3%	0%	0%	3%	31
Quality of implementation	0%	97%	3%	0%	0%	3%	31

5.2.13 Overall Customer Satisfaction with the Program

Overall, customers were satisfied with the Mercantile Customer Program. As demonstrated in Table 5-19, 24% of respondents said that they were very satisfied with their overall experience with the program and another 52% said they were satisfied. Large percentages of respondents were satisfied or very satisfied with the steps needed to get through the program (76%) and the range of equipment that qualifies for the Mercantile Customer Program (79%).

The two program elements that customers were the least satisfied with were the application approval time and the rebate time. Seventeen percent of customers were very dissatisfied with the amount to time it took to get their application approved. Further, 28% of cash recipients were very dissatisfied with the amount of time it took to receive their rebate.

Table 5-19 Satisfaction with Overall Program Elements

Element of Program Experience	*Very satisfied*	*Satisfied*	*Neither dissatisfied nor satisfied*	*Dissatisfied*	*Very dissatisfied*	*Not sure*
The steps you had to take to get through the program (n=29)	17%	59%	3%	7%	3%	10%
The amount of time it took to get your application approved (n=29)	17%	41%	10%	7%	17%	7%
The amount of time it took to get your rebate (Cash Recipients Only) (n=25)	4%	36%	8%	4%	28%	20%
The range of equipment that qualifies for the Mercantile Customer Program (n=29)	17%	62%	3%	0%	7%	10%
The program overall (n=29)	24%	52%	10%	7%	3%	3%

5.2.14 Programs Operations Perspective

This section summarizes the core findings of interviews conducted with the program staff for the purposes of developing internal program management perspectives.

In order to gain insight into the Mercantile Customer Program operation and delivery, interviews were conducted with key members of the program staff. These interviews focused on the overall effectiveness of the program process and the identification of areas for future program improvement. Interview questions related to the respondents' individual roles in administering the programs as well as their perceptions of overall program strengths, weaknesses, and opportunities for the future.

Key trends and issues addressed by respondents include:

- **Scheduled Program Meetings are Effectively Supporting Program Administration:** Various scheduled program meetings, including monthly and quarterly meetings, occur amongst the Companies' staff members regarding the Mercantile Customer Program. During monthly regional meetings, the Companies' staff members and regional customer service departments walk through issues with applications and any regulatory issues that may have arisen. In addition to the monthly regional meetings, there are also quarterly Energy Efficiency Collaborative meetings hosted by the Companies. These meetings serve various purposes. They enable the Companies, Administrator organizations, and other parties to describe status updates that they have. The meetings also serve as a good forum for dialogue and questions.
- **The Companies Provide Strong Support to Administrator Organizations**: The Companies have strong relationships with their Administrator organizations. They provide thorough training to the Administrators. These trainings typically occur when there have been changes, regulatory or otherwise, that impact the program administration and delivery. In addition, Administrators are sent monthly updates on the program. These updates contain the statuses of all applications that the particular Administrator has in the queue.
- **Current tracking system Provides Flexibility but Leads to Inconsistent Data:** The tracking system used for the current program cycle has reached it technological limitations. In the past, the tracking system was very restrictive. It gave customers fixed options to choose from. This created a great deal of frustration. The current system allows the customer to enter information freely into the system. This is problematic because there is a lack of consistency in the information provided. The Companies must then go back and clean the information to ensure that it is accurate.
- **Online Application System is in Progress:** The Companies are looking to launch an online application system. The purpose of the online system is to improve efficiency in the administration process of the program. The system will allow customers to access and check the status of their applications online. The system is expected to resolve the issues with the current program tracking system discussed above. The

online application will also be beneficial because it will have a feature that can automatically shift workflow from the C&I Programs to the Mercantile Customer Program if the projects qualify.

- **Quality Control Performed by the Companies and Administrator Organizations:** For applications submitted by Administrators, quality control functions are primarily the responsibility of that particular Administrator organization. The Companies' primary role in quality control is the reviewing of applications for completeness, consistency and to ensure that the proper documentation has been provided to substantiate the claimed savings. However, when other issues arise, the applications are typically forwarded back to Administrators to resolve, as they are being compensated to perform this service. Administrators and Companies' staff members report that there have not been any major issues with quality control. If minor issues arise, the Companies request that the appropriate Administrator organization resolve the issues.
- **Responsibility of Program Marketing Distributed across Various Parties:** The Mercantile Customer Program is a self-directed program to provide an opportunity for mercantile customers to recoup investments they have made in energy efficiency projects. Consequently, it is not primarily intended to motivate new projects and accordingly requires less marketing effort than the business incentive programs. However, various actors are responsible for increasing awareness of the program among eligible customers. As shown by survey results, many of the customers are informed by the Companies' Customer Service Representatives. The program has three dedicated representatives, one for each distribution company, who are key to the promotional effort. In particular, there are links to the Mercantile Customer Program on the EnergySaveOhio website. Administrators are responsible for promoting awareness of the program to their clients.

5.2.15 Administrator Perspective

This section summarizes the core findings of interviews conducted with program Administrators for the purposes of gaining insight into the application process and to develop a sense of program satisfaction levels. Administrators are third party organizations that educate and market the program among their respective customers. They also assist customers in completing applications. They receive ratepayer compensation for providing these services for both the Mercantile Customer Program and the C&I programs. Administrators report their experiences with customers, program marketing strategies, and provide opinions of how the program could be improved.

Key trends and issues addressed by respondents include:

- **Administrators Assist with Various Rebate Project Tasks:** Administrators differed with regards to how much assistance they provided to customers. In some cases, customers complete the entire application and Administrators simply review it. At other times, the customer compiles the data and the Administrator completes all forms for

them. However, the majority of administrations completed a wide array of quality control functions. Typical types of quality control functions completed by Administrators include: ensuring that the applications are filled out correctly, ensuring that appropriate supporting documents are provided, and reviewing savings calculations. Several Administrators went beyond these basic tasks and created custom calculations for customers, completed energy audits, completed walk-throughs, provided technical support to customers and provided power capacity management. A few Administrators noted that they conduct pre-metering at facilities, log data, and do the analysis themselves. However, the majority of the Administrators do not offer intensive design or project implementation assistance. The primary focus is on assessing and documenting expected savings.

- **Customers May Be Referred to Other Programs:** The role of the Administrators, as well as the implementation Contractor (Sodexo) for the C/I Equipment Programs, is to ensure that customers are aware of all types of incentive programs that meet their needs. If a project is eligible, it will be referred to the utilities other C/I Equipment Programs. However, if a project does not qualify for other utility C/I Equipment Programs because of time constraints, it will be considered for the Mercantile Customer Program.
- **Cash Rebate Option Most Popular Type of Incentive:** All program participants have the option of choosing the incentive in the form of a cash rebate or in the form of a rider exemption. In the past, the rider exemption option was the preferred choice because it entailed a longer-term view of energy efficiency. The customers who tend to choose this option are focused on what compliance costs over time. This program cycle, the cash rebate option has been most popular. According to the Administrators, the cash rebate option offers a sense of security to customers. They are actually able to see the money going into their accounts. These funds can be used immediately or saved for future projects. Riders can be problematic because they change frequently over time. This creates uncertainty for customers. Also, with the rider exemption, there is no specific line item for the DSE2 rider charge on the customers' utility bills, which makes customers doubt that they are actually receiving the incentive. Administrators differ with regard to what level of guidance they provide to customers regarding the two options. Some simply recommend the cash rebate option for the reasons stated above. Others utilize the information provided to them by the customer. Using this information, they work with the customer to evaluate the benefits of each option. For example, several of the administrations average riders from previous years in an attempt to forecast the expected rider. Ultimately, it is the customer's decision as to which option to pursue.
- **Administrators Participate in Training Provided by the Companies for Program:** The vast majority of Administrators attended some form of training provided by the Companies on the Mercantile Customer Program in the past one to three years. Only a select few had not attended such training sessions. There were several purposes of the training. Some of the trainings were more general in nature and simply introduced

Administrators to how the program works. Other trainings dealt with updates and program changes, and legal requirements. Some Administrators felt that the trainings were useful because the programs are standardized. This is particularly useful for individuals without technical knowledge. Others found it not as helpful because they felt more is learned with experience and trial and error.

- **Communications with the Companies are Effective:** Most of the Administrators did not have regularly scheduled communication with the Companies. Rather, such communications occur as needed via email or telephone. Administrators contact the Companies for several reasons. The Administrators may contact them for clarification and elaboration on what is needed for an application, follow up on the status of applications, or to make revisions to applications. Administrators may also contact program staff for issues or problems with applications, such as when items do not calculate correctly. The Administrators were in agreement that the Companies were responsive and appropriately addressed their issues and answered their questions.

  Once a month, the administrative staff at the Companies provides all Administrators with a spreadsheet. This spreadsheet provides updates and statuses of all projects of that particular Administrator. Administrators found these spreadsheets to be very useful.

- **Administrators Use Various Channels to Promote Program:** Administrator organizations are contractually obligated to provide information about the Mercantile Customer Program to their members and to encourage participation in it. However, the approach described during interviews to meet this obligation varied across organizations. Some Administrators indicated that they provide information to their members about the program and the benefits of participating in it. They may do this through email communications, distributing printed materials about the program to customers, and through webinars, or presentations at energy-related events. Other Administrators described a more active role in promoting the program that involves telephone calls and face-to-face meetings with individual members.

- **Administrators Calculate Savings for Various Types of Projects:** The majority of Administrators calculate savings for customer projects. Only a few rely on outside parties, such as engineering firms or auditors, to calculate these savings. The Administrators calculated savings for various types of projects including: lighting, compressed air, HVAC, motors, drives, control systems, and many more. The Administrators rely on the Companies' calculators for lighting projects. However, they oftentimes create calculators for specific projects as needed.

  To develop energy savings, Administrators rely upon project information reported by the customer about baseline equipment, hours of operation and other operating characteristics. Other sources are also referenced to develop savings estimates including the Ohio Technical Reference Manual (TRM), Certified Energy Manager calculation books, and other sources.

- **Retroactive Approach of Program Desirable for Customers:** The greatest strength of the program according to Administrators was that it is retroactive. Customers can receive incentives for projects completed in the past 3 years. In addition, customers are able to get something back from the utility for projects they are already implementing.

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6. Summary and Conclusions

The interviews and surveys that were conducted provided a perspective on program operations and effectiveness during 2013. The following presents a selection of key conclusions from 2013:

- **Customers Satisfied With Program Overall:** Customers were satisfied with their overall experience with the program. A large number of customers were satisfied with the steps needed to get through the program. Customers were least satisfied with the application approval time and the amount of time it took to receive their rebate.
- **Positive Interactions with Program Staff:** Nearly all survey respondents who interacted with program staff found them to be knowledgeable. Participants were also satisfied with the thoroughness and promptness of responses from program staff members.
- **Few Problems with Application Process:** Survey respondents were asked a series of questions about the application process and they generally provided a favorable assessment of it. Most survey respondents indicated that the information on how to complete the application forms was mostly or completely clear and 79% found the overall application process to be completely or somewhat acceptable.
- **Administrators Receive Strong Support from Program Staff:** The program staff strives to maintain strong relationships with Administrator organizations. Administrators educate and market the program among their respective customers. The training provided to Administrators under the Mercantile Customer Program is aimed at keeping Administrators up to date on program changes—regulatory and otherwise. The program staff also provides Administrators with monthly spreadsheets that contain status updates of all their applications in the queue. The Administrators found these spreadsheets to be very useful.
- **Program Primarily Promoted by Administrators and the Companies' Customer Service Representatives:** Given that the Mercantile Customer Program is a self-direct program, it requires less marketing than other programs. However, the program is promoted primarily by Administrator organizations and the Companies' Customer Service Representatives. Administrators have direct contact with customers. They promote the program with customers on the phone and in person. They also distribute electronic and printed materials to customers regarding the program. Some also speak about the program in public forums.

  The Companies' Customer Service Representatives promote the Mercantile Customer Program and the website also promotes program awareness.
- **Quality Control Performed by the Companies and Administrator Organizations:** For applications submitted by Administrators, quality control functions are primarily the responsibility of that particular Administrator organization. The Companies' primary role in quality control is the reviewing of applications for completeness,

consistency and to ensure that the proper documentation has been provided to substantiate the claimed savings. However, when other issues arise, the applications are typically forwarded back to Administrators to resolve, as they are being compensated to perform this service. Administrators and Companies' staff members report that there have not been any major issues with quality control. If minor issues arise, the Companies request that the appropriate Administrator organization resolve the issues.

The following recommendations are offered to support ongoing program improvements:

- **Provide Documentation to Alert Customers of Their Rider Exemption Status:** Although the cash rebate option was most popular during this program cycle, some customers have chosen the rider exemption option. However, customers are often distrustful of the rider exemption option because they are unable to see the immediate effect, as with the cash rebate option. Staff from Administrator organizations indicated that customers who chose the rider exemption option were often uncertain that they were actually retaining the benefits because there was no documentation of it. Program staff should consider incorporating notification of receipt of the rider exemption into the process.
- **Focus Trainings More on the Completion of Paperwork:** The current training for Administrators is more aligned towards Administrators who have previous experience with the program. The current trainings are heavily focused on program changes, updates, and regulatory requirements. Some of individuals from the Administrator organizations felt that the training was adequate for those who had experience with the Mercantile Customer Program, but that they were less useful for newer staff at the Administrator organizations. Individuals who undertook new roles in their Administrator organizations and had little experience with the program often felt unprepared to complete the application spreadsheets, for example. Addressing these knowledge gaps with new staff should help improve the quality of the application materials submitted. To this end, the Companies should consider emphasizing that Administrators ensure that new staff receives training that is either provided by the Companies or by Administrator staff who are familiar with the program.

Appendix A: Required Savings Tables

This appendix contains annualized gross kWh savings, peak demand reductions, and lifetime savings for the Mercantile Customer Program.

Table A-1. Summary of kWh Savings for Mercantile Customer Program

Operating Company	*Ex Ante kWh Savings*	*Ex Post kWh Savings*	*Realization Rate*
CEI	24,239,701	19,301,551	80%
OE	33,129,512	24,945,805	75%
TE	41,601,827	36,298,952	87%
Total Companies	98,971,040	80,546,308	81%

Table A-2. Summary of Peak kW Savings for Mercantile Customer Program

Operating Company	*Ex Ante Peak kW Savings*	*Ex Post Peak kW Savings*	*Realization Rate*
CEI	2,839.00	2,308.56	81%
OE	3,907.00	3,092.61	79%
TE	4,023.00	3,581.53	89%
Total Companies	10,769.00	8,982.70	83%

Table A-3 Summary of Lifetime kWh Savings for Mercantile Customer Program

Operating Company	*Lifetime Ex Post kWh Savings*
CEI	289,523,268
OE	374,187,074
TE	544,484,277
Total Companies	1,208,194,618

Appendix B: Participant Survey Instrument

FirstEnergy Ohio 2013 Mercantile Customer Program Participant Survey

1. What is your job title or role?
    1. Facilities Manager
    2. Energy Manager
    3. Other facilities management/maintenance position
    4. Chief Financial Officer
    5. Other financial/administrative position
    6. Proprietor/Owner
    7. President/CEO
    8. Manager
    97. Other (please specify)

2. Which of the following, if any, does your company have in place at the [LOCATION]? (Select all that apply)
    1. A person or persons responsible for monitoring or managing energy usage
    2. Defined energy savings goals
    3. A specific policy requiring that energy efficiency be considered when purchasing equipment
    4. Carbon reduction goals
    5. Other policies or procedures regarding energy efficiency or use (please describe)
    6. None of the above
    98. Don't know

AWARENESS [DO NOT DISPLAY IN SURVEY]

3. How did you learn about [EDC's] Mercantile Program? (Select all that apply)
    1. Received an informational brochure or newsletter
    2. From an [EDC] Key Account Representative
    3. From an [EDC] Account Service Advisor
    4. From a program representative or service provider
    5. From [EDC]'s website
    6. TV / radio ad's sponsored by [EDC]
    7. Friends or colleagues
    8. From an architect, engineer or energy consultant
    9. From an equipment vendor or building contractor
    10. Through past experience with the program
    97. Other (please explain)
    98. Don't know

4. In addition to the Mercantile Customer Program, did you know that [EDC] offers incentive programs for energy efficiency upgrade projects?
    1. Yes

2. No
98. Don't know

[DISPLAY Q5 AND Q6 AND Q7 IF Q4 = 1]

5. Have you applied for incentives through these programs before?
   1. Yes
   2. No
   98. Don't know

6. Why didn't you choose to receive incentives through these programs for the Mercantile Customer Program project? (Select all that apply)
   1. The equipment was implemented before I learned of the incentive programs
   2. I was concerned that applying for an incentive would delay the project
   3. The financial payoff I received through Mercantile Customer Program was better
   4. The incentive programs were unavailable when the project was planned
   97. Other (please explain)

7. Is your firm considering undertaking any energy efficiency projects in the next five years?
   1. Yes
   2. No
   98. Don't know

[DISPLAY Q**8** IF Q**7** =1]

8. Do you plan on applying for financial assistance through one of the incentive programs or through the Mercantile Customer Program again?
   1. I plan on applying for financial assistance through one of the incentive programs
   2. I plan on applying for financial assistance through the Mercantile Customer Program
   3. I plan on applying for financial assistance to both programs for different projects
   4. I do not plan on applying for financial assistance
   98. Don't know

PROGRAM DELIVERY EFFICIENCY [DO NOT DISPLAY]

9. Regarding your organization's decision to participate in the Mercantile Customer Program, who initiated the discussion about the financial assistance opportunity? Would you say…?
   1. Your organization initiated it
   2. Your vendor or contractor initiated it
   3. The idea arose in discussion between your organization and your vendor or contractor
   4. Some other way (please specify)

98. Don’t Know

10. Which of the following people worked on completing your application for the [cash rebate/rider exemption] OR [cash rebate and rider exemption] (including gathering required documentation)? (Select all that apply)
    1. Yourself
    2. Another member of your company
    3. A contractor
    4. An equipment vendor
    5. A designer or architect
    97. Someone else (please specify)
    98. Don’t know

11. Did you work through one of the following organizations when you applied for the Mercantile Customer Program?
    1. Association of Independent Colleges & Universities
    2. COSE
    3. County Commissioners' Association of Ohio
    4. Industrial Energy Users – Ohio
    5. Ohio Hospitals Association
    6. Ohio Manufacturer's Association
    7. Ohio Schools Council
    8. Roth Brothers
    9. The E-Group
    10. Utility regional customer service
    11. Did not work with any of these organizations

[DISPLAY Q12 IF Q11 <11]

12. How satisfied or dissatisfied were you with your experience in working with the organization?
    1. Very satisfied
    2. Satisfied
    3. Neither satisfied nor dissatisfied
    4. Dissatisfied
    5. Very dissatisfied
    6. Don't know

[DISPLAY Q13 IF Q12 = 4 OR 5]

13. Why were you dissatisfied with your experience?

14. Why did you choose the [cash rebate/rider exemption] instead of the [rider exemption/cash rebate? (Select all that apply)
    1. The paperwork was easier
    2. The process was quicker
    3. Financial benefit was better

4. Preferred getting a single payment
97. Other (please explain)

15. Why did you choose the [cash rebate/rider exemption] instead of the [rider exemption/cash rebate? (Select all that apply)
    1. The paperwork was easier
    2. The process was quicker
    3. Financial benefit was better
    4. Preferred getting a single payment from the cash rebate
    5. Other (please explain)
    98. Don't know

[DISPLAY Q16 AND Q17 IF Q10 = 1]

16. How did you submit your application worksheets?
    1. As an email attachment
    2. By fax
    3. By postal mail
    97. Other (please specify)
    98. Don't know

[DISPLAY Q17 IF CASH REBATE]

17. Thinking back to the application process, please rate <u>the clarity of information</u> on how to complete the …

	Not at all clear	Somewhat clear	Mostly clear	Completely clear	Don't know
a. Mercantile Customer Program Application	1	2	3	4	98
b. Cash Rebate Forms	1	2	3	4	98
c. PUCO Application to Commit	1	2	3	4	98
d. Mercantile Customer Project Commitment Agreement	1	2	3	4	98

[DISPLAY Q18 IF CASH REBATE]

18. Thinking back to the application process, please rate <u>the clarity of information</u> on how to complete the …

	Not at all clear	Somewhat clear	Mostly clear	Completely clear	Don't know
a. Mercantile Customer Program Application	1	2	3	4	98

b. PUCO Application to Commit	1	2	3	4	98
c. Mercantile Customer Project Commitment Agreement	1	2	3	4	98

[DISPLAY Q19 ONLY IF Q17a-d OR Q18a-d = 1 OR 2]

19. What information, including instructions on forms, needs to be further clarified?

[DISPLAY Q20 ONLY IF Q10 =1]

20. Using a scale of completely unacceptable, somewhat unacceptable, somewhat acceptable, completely acceptable, how would you rate the following…

	Completely unacceptable	Somewhat unacceptable	Somewhat acceptable	Completely acceptable
d. the ease of finding how to apply for the Mercantile Customer Program on [EDC]'s website	1	2	3	4
e. the ease of using the application forms	1	2	3	4
f. the time it took to have the application approved	1	2	3	4
g. the effort required to provide required invoices or other supporting documentation	1	2	3	4
h. the overall application process				

21. Did you have a clear sense of whom you could go to for assistance with the application process?
    1. Yes
    2. No
    99. Don't know

22. After initial submission, were you (or anyone acting on your behalf) required to resubmit or provide additional documentation before your application was approved?
    1. Yes
    2. No
    99. Don't know

[DISPLAY Q23 ONLY IF Q22=1]

23. Which of the following were reasons that you had to resubmit your application? (Select all that apply)

1. Issues related to how energy savings were calculated
2. Issues related to additional supporting documentation such as invoices
97. Other issues (please specify)
98. Don't know

24. [IF CASH REBATE] How did the rebate amount compare to what you expected?
    1. It was much less
    2. It was somewhat less
    3. It was about the amount expected
    4. It was somewhat more
    5. It was much more
    99. Don't know

EQUIPMENT SELECTION [DO NOT DISPLAY]

[DISPLAY IF INSTALLED]

25. How did each of the following types of people affect your decision to implement the efficient equipment? (Select all that apply)

	Provided no input	Input did not affect decision	Small effect on decision	Moderate to large effect on decision	Critical effect – could not have made decision without it	Don't know
a. Vendor (retailer)	1	2	3	4	5	98
b. Contractor (installer)	1	2	3	4	5	98
c. Designer or architect	1	2	3	4	5	98
d. Utility staff member, such as an account representative	1	2	3	4	5	98

26. Was there anyone else who affected your decision to implement the energy efficient equipment?
    1. Yes; who?
    2. No
    98. Don't know

[DISPLAY Q27 IF Q25 = 4 OR 5 OR Q26 = 1]

27. What did they do that affected your decision?

28. Did you work directly with a retailer to purchase the equipment?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q29 IF Q28= 1]

29. How long did you have to wait for the program-qualified equipment?
    1. Readily available
    2. Less than 1 week
    3. 1-2 weeks
    4. 3-4 weeks
    5. 5-6 weeks
    6. More than 6 weeks
    99. Don't Know

30. Please rate your satisfaction or dissatisfaction with ….

	Very Dissatisfied	Dissatisfied	Neither Satisfied Nor Dissatisfied	Satisfied	Very Satisfied	Not sure	Not applicable – no equipment implemented
a. … the equipment that was implemented	1	2	3	4	5	98	99
b. … the quality of the implementation	1	2	3	4	5	98	99

31. Who implemented your program-qualified equipment or efficiency upgrades?
    1. Your own staff
    2. A contractor you've worked with before
    3. A contractor recommended by your [EDC]
    4. A new contractor that someone else recommended
    97. Other (please specify)
    98. Don't know

32. Is the equipment that you implemented under the Mercantile Customer Program still in place and operating?
    1. Yes
    2. No
    98. Don't know

[DISPLAY Q33 IF Q32 = 2]

33. Why is the equipment no longer implemented or operating?

CUSTOMER SATISFACTION [DO NOT DISPLAY]

The following few questions pertain to your communications with the program staff. Program staff is anyone that reviewed your application, conducted site inspections, determined your incentive amount, or processed your incentive check. Program staff are not anyone hired by you to conduct an audit, design your system, or implement your hardware.

34. In the course of doing this project did you have any interactions with program staff?
    1. Yes
    2. No
    98. Not sure

[DISPLAY Q35 AND Q36 If Q34 = 1]

35. On the scale provided, please indicate how knowledgeable were program staff about the issues you discussed with them?

Not at all knowledgeable	Slightly knowledgeable	Somewhat knowledgeable	Fairly knowledgeable	Very knowledgeable	Not sure
1	2	3	4	5	98

36. On the scale provided, please indicate how satisfied or dissatisfied are you with:

	Very dissatisfied	Dissatisfied	Neither dissatisfied nor satisfied	Satisfied	Very satisfied	Not sure	Not applicable – had no questions or concerns
a. how long it took program staff to address your questions or concerns	1	2	3	4	5	98	99
b. how thoroughly program staff addressed your question or concern	1	2	3	4	5	98	99

[DISPLAY IF CASH REBATE OR BOTH]

37. How satisfied or dissatisfied are you with:

	Very dissatisfied	Dissatisfied	Neither dissatisfied nor satisfied	Satisfied	Very satisfied	Not sure
a. the steps you had to take to get through the program	1	2	3	4	5	98
b. the amount of time it took to get your application approved	1	2	3	4	5	98
c. the amount of time it took to get your rebate	1	2	3	4	5	98

d. the range of equipment that qualifies for the Mercantile Customer Program	1	2	3	4	5	98
e. the program, overall	1	2	3	4	5	98

[DISPLAY IF RIDER EXEMPTION]

38. How satisfied or dissatisfied are you with:

	Very dissatisfied	Dissatisfied	Neither dissatisfied nor satisfied	Satisfied	Very satisfied	Not sure
f. the steps you had to take to get through the program	1	2	3	4	5	98
g. the amount of time it took to get your application approved	1	2	3	4	5	98
h. the range of equipment that qualifies for the Mercantile Customer Program	1	2	3	4	5	98
i. the program, overall	1	2	3	4	5	98

[DISPLAY Q39 If Q35, Q37a or b, or Q38a, b, c, or d = 1 OR 2]

39. Please describe the ways in which you were not satisfied with the aspects of the program mentioned above?

PROJECT DECISION MAKING [DO NOT DISPLAY]

40. Before you knew about the Mercantile Customer Program, had you purchased and implemented any equipment at the [LOCATION]?
    1. Yes
    2. No
    99. Don't know

41. Did you decide to implement the energy efficiency project that you received the [cash rebate/rider exemption] for before you knew about the Mercantile Customer Program?
    1. Yes, decided to implement the project before learning about the program
    2. No, learned of the program after implementing the project
    99. Don’t know

42. Has your organization purchased any significant equipment in the last three years for which you did not apply for a financial assistance through an energy efficiency program at the [LOCATION]?
    1. Yes. Our organization purchased equipment but did not apply for financial assistance.
    2. No. Our organization purchased significant equipment and applied for financial assistance.
    3. No significant equipment was purchased by our organization.
    99. Don't know

43. Before learning of the Mercantile Customer Program, had you implemented any equipment or measure similar to the [Measure/ Equipment type] at the [LOCATION]?
    1. Yes
    2. No
    98. Don't know

44. Did you have plans to implement the [Measure/ Equipment type] at the [LOCATION] before learning of the Mercantile Customer Program?
    1. Yes
    2. No
    3. Don't know

[DISPLAY Q45 IF Q44 = 1]

45. Would you have gone ahead with this planned implementation even if you had not participated in the program?
    1. Yes
    2. No
    3. Don't know

46. How important was previous experience with the Mercantile Customer Program in making your decision to implement the [Measure/ Equipment type] at the [LOCATION]?
    1. Did not have previous experience with program
    2. Very important
    3. Somewhat important
    4. Only slightly important
    5. Not at all important
    98. Don't know

47. Did a Mercantile Customer Program or other [EDC] representative recommend that you implement the [Measure/ Equipment type] at the [LOCATION]?
    1. Yes

2. No
98. Don’t know

[DISPLAY Q48 IF Q47 = 1]

48. If the Mercantile Customer Program representative had not recommended implementing the equipment, how likely is it that you would have implemented it anyway?
    1. Definitely would have implemented
    2. Probably would have implemented
    3. Probably would not have implemented
    4. Definitely would not have implemented
    98. Don't know

49. Would you have been financially able to implement the [Measure/ Equipment type] at the [LOCATION] without the [cash rebate/rider exemption] from the Mercantile Customer Program?
    1. Yes
    2. No
    98. Don’t know

50. If the financial assistance from the Mercantile Customer Program had not been available, how likely is it that you would have implemented the [Measure/ Equipment type] at the [LOCATION] anyway?
    1. Definitely would have implemented
    2. Probably would have implemented
    3. Probably would not have implemented
    4. Definitely would not have implemented
    98. Don't know

[DISPLAY Q51 IF NOT PROCESS IMPROVEMENT]

51. We would like to know whether the availability of information and financial assistance through the Mercantile Customer Program affected the quantity (or number of units) of the [Measure/ Equipment type] that you purchased and implemented at the [LOCATION].

    Did you purchase and implement more [Measure/ Equipment type] than you otherwise would have without the program?
    1. Yes
    2. No, program did not affect quantity purchased and implemented.
    98. Don’t know

[DISPLAY Q52 IF NOT PROCESS IMPROVEMENT OR CONTROLS]

52. We would like to know whether the availability of information and financial assistance through the Mercantile Customer Program affected the level of energy efficiency you chose for the [Measure/ Equipment type] at the [LOCATION].

    Did you choose equipment that was more energy efficient than you would have chosen because of the program?
    1. Yes
    2. No, program did not affect level of efficiency chosen for equipment.
    98. Don't know

[DISPLAY 53 IF Q52 = 1]

53. How much more efficient was the equipment? (i.e., "xx% more efficient")

54. We would like to know whether the availability of information and financial assistance through the Mercantile Customer Program affected the timing of your implementation of the [Measure/ Equipment type] at the [LOCATION].
    Did you purchase and implement the [Measure/ Equipment type] earlier than you otherwise would have without the program?
    1. Yes
    2. No, program did not affect timing of purchase and implementation.
    98. Don't know

[DISPLAY Q55 IF Q54 = 1]

55. When would you otherwise have implemented the equipment?
    1. Less than 6 months later
    2. 6 months to less than 1 year
    3. 1 year to less than 2 years
    4. 2 years to less than 5 years
    5. 5 or more years

ADDITIONAL EFFICIENCY PROJECTS [DO NOT DISPLAY]

56. Because of your experience with the Mercantile Customer Program, have you bought, or are you likely to buy, energy efficient equipment without applying for a financial incentive or rebate?
    1. Yes, have already bought non-incentivized efficiency equipment because of the experience with the program.
    2. Yes, likely to buy efficiency equipment because of the experience with the program.
    3. No
    98. Don't know

[DISPLAY Q57 IF Q56= 2 OR 98]

57. We'd like to call you in a few months for a very short follow-up about other efficiency equipment purchases. If that would be all right. please provide us with the best person to contact and their phone number

Name

Phone number

[DISPLAY Q58 AND Q59 AND Q60 AND Q61 IF Q56 = 1]

58. What equipment did you purchase?

59. What motivated you to purchase this equipment?

60. Was this equipment implemented, or will it be implemented, at the same facility (or facilities) as the equipment for which you received a rebate?
    1. Yes
    2. No, where was the equipment implemented or where do you plan to implement it?
    98. Don't know

61. How important was your experience with the program to your decision to implement the additional energy efficiency measures?
    1. Very important
    2. Somewhat important
    3. Only slightly important
    4. Not at all important
    98. Don't know

62. How important was your past participation in any programs offered by [EDC] to your decision to implement the additional energy efficiency measures?
    1. Very important
    2. Somewhat important
    3. Only slightly important
    4. Not at all important
    98. Don't know

63. Why didn't you apply for or receive incentives for those items?
    1. Didn't know whether equipment qualified for financial incentives
    2. Equipment did not qualify for financial incentives
    3. Too much paperwork for the financial incentive application
    4. Financial incentive was insufficient
    5. Didn't have time to complete paperwork for financial incentive application
    6. Didn't know about financial incentives until after equipment was purchased

97. Other reason (please describe)

FIRMOGRAPHIC [DO NOT DISPLAY]

64. Which of the following best describes the type of work that your firm or organization does at the [LOCATION]?
    1. Industrial
    2. Restaurant (not fast food)
    3. Fast food restaurant
    4. Retail
    5. Office
    6. Grocery and convenience
    7. School
    8. Lodging
    9. Warehouse
    97. Other (please specify)
    98. Not sure

65. Including all the properties, how many separate work locations does your organization own or lease space in, in the First Energy Ohio Companies' territory? (A work location may consist of multiple buildings in close proximity to each other, such as a university campus – please indicate the number of locations)

66. How many square feet (indoor space) is the part of the property at the [LOCATION] that your firm or organization occupies? (If your firm or organization occupies the entire property, indicate the total size of that property.)
    1. Less than 5,000
    2. 5,001 to 10,000
    3. 10,001 to 20,000
    4. 20,001 to 50,000
    5. 50,001 to 75,000
    6. 75,001 to 100,000
    7. 100,001 to 250,000
    8. 250,001 to 500,000
    9. 500,001 to 1,000,000
    10. More than 1,000,000
    98. Not sure