

2012 Evaluation of EnergySaveOhio Mercantile Customer Program

Evaluation Report

Prepared for the FirstEnergy Ohio Companies:

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

Prepared by:



ADM Associates, Inc.

3239 Ramos Circle
Sacramento, CA 95827
916.363.8383

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1. Executive Summary

The Ohio operating companies The Cleveland Electric Illuminating Company (“CEI”), Ohio Edison (“OE”), and The Toledo Edison (“TE”) (collectively “Companies”), continued the Mercantile Customer Program during 2012. This report presents the results of the impact and process evaluations of the Mercantile Customer Program activity occurring during 2012.

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 $\pm 10\%$ 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 31 projects, for which on-site measurements and verification data were collected, account for approximately 43% of the expected kWh savings.
- Customer surveys provided the information for process evaluation. A total of 57 customer decision makers were interviewed. Additionally, relevant Company staff members were interviewed to provide information for the process evaluation.

Table 1-1 Sample Sizes for Data Collection Efforts

<i>Type of Data Collected</i>	<i>Sample Size</i>
On-Site Measurement and Verification	31
Customer Decision Maker Survey	57

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

The realized energy savings of the 2012 Mercantile Customer Program from the three service territories are summarized in Table 1-2. For the entire program, the realized gross energy savings totaled 91,606,590 kWh. The gross realization rate for the program is 77%.

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

<i>Operating Company</i>	<i>Rate Code</i>	<i>Ex Ante kWh Savings</i>	<i>Ex Post kWh Savings</i>	<i>Realization Rate</i>
CEI	GP	448,676	292,765	65%
	GS	35,157,411	26,176,391	74%
	SU	12,889,553	11,915,360	92%
	STL	21,810	23,452	108%
	TRF	449,616	292,463	65%
Total		48,967,066	38,700,431	79%
OE	GP	3,332,710	2,424,634	73%
	GS	23,674,850	20,677,047	87%
	GSU	1,546,702	1,062,359	69%
	GT	4,651,874	4,211,632	91%
Total		33,206,136	28,375,673	85%
TE	GP	7,720,521	6,684,168	87%
	GS	5,200,299	4,372,931	84%
	GSU	2,575,034	1,761,734	68%
	GT	20,603,128	11,711,652	57%
Total		36,098,982	24,530,485	68%
Grand Total		118,272,184	91,606,590	77%

The realized gross peak kW reductions of the 2012 Mercantile Customer Program from the three service territories are summarized in Table 1-3. The achieved peak demand savings for the program are 18,010.04 kW. The gross realization rate for the program is 106%.

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

<i>Operating Company</i>	<i>Rate Code</i>	<i>Ex Ante Peak kW Savings</i>	<i>Ex Post Peak kW Savings</i>	<i>Realization Rate</i>
CEI	GP	4.09	22.33	546%
	GS	5,447.69	6,425.49	118%
	GSU	1,735.46	2,227.62	128%
	STL	-	-	-
	TRF	98.00	93.49	95%
Total		7,285.24	8,768.93	120%
OE	GP	676.06	796.71	118%
	GS	3,038.88	3,454.65	114%
	GSU	105.00	121.53	116%
	GT	613.05	663.44	108%
Total		4,432.99	5,036.34	114%
TE	GP	916.49	1,015.43	111%

<i>Operating Company</i>	<i>Rate Code</i>	<i>Ex Ante Peak kW Savings</i>	<i>Ex Post Peak kW Savings</i>	<i>Realization Rate</i>
	GS	532.77	906.08	170%
	GSU	379.00	171.13	45%
	GT	3,416.30	2,112.13	62%
Total		5,244.55	4,204.78	80%
Grand Total		16,962.78	18,010.04	106%

After the date of implementation for a measure under the Mercantile Customer Program, the number of months remaining in 2012 for which annual savings could be attributed is referred to as first-year pro rata savings. The first-year pro rata ex post kWh savings for the Mercantile Customer Program is summarized in Table 1-4. For the first-year pro rata, the realized gross energy savings totaled 82,257,090 kWh.

Table 1-4 Summary of First Year Pro Rata kWh Savings for Mercantile Customer Program

<i>Operating Company</i>	<i>Rate Code</i>	<i>First Year Ex Post kWh Savings</i>
CEI	GP	198,168
	GS	24,311,285
	GSU	9,518,953
	STL	14,264
	TRF	292,463
Total		34,335,134
OE	GP	1,719,678
	GS	17,870,932
	GSU	858,151
	GT	4,211,632
Total		24,660,394
TE	GP	6,243,344
	GS	4,134,755
	GSU	1,761,734
	GT	11,121,729
Total		23,261,562
Grand Total		82,257,090

The interviews and surveys that were conducted provided a perspective on program operations and effectiveness during 2012. The following presents a selection of key conclusions from 2012:

- **High Program Satisfaction:** The majority of participants were very satisfied with their overall experience with the program, although some expressed dissatisfaction with the application process. Sixteen percent of participants were either dissatisfied

or very dissatisfied with the effort required to apply for the incentives or with the application forms. Additionally, nearly a third of participants were somewhat or very dissatisfied with the time required to receive incentives. Program staff is aware of the dissatisfaction with the length of time required to receive the incentive.

- **Preference for Cash Incentive over Rider Exemption:** A large share of the 2012 savings came from participants who elected to receive the cash incentive (72%) over the rider exemption (28%). Furthermore, a larger share of those who completed projects in 2012 chose the cash incentive instead of the rider exemption compared to those who completed projects in prior years. This may have occurred because projects completed in these years were motivated by the program whereas older projects were completed by customers on their own initiative. Participants motivated by the program may be more concerned with quickly recouping their costs through the incentive. Analysis of the reasons for electing the cash incentives found that most participants chose the cash incentive because they thought it offered a better rate of return than the exemption.
- **Most Savings from Older Projects:** Most of the savings achieved during 2012 came from projects completed prior to 2012. Although the generation of savings from older projects suggests that the Mercantile Customer Program's ability to generate savings in the future may diminish, similar results were found last year. Consequently, the program seems to be able to sustain savings activity from projects that were completed in prior years.
- **Manufacturing and Industrial Firms Account for Smaller Share of Savings than in 2011:** Approximately 24% of the 2012 savings accrued through the program were from manufacturing whereas approximately half of the 2011 savings came from manufacturing firms.
- **Customers Satisfied with Administrator Organizations:** In addition to promoting the program, the administrator organizations help participants file applications. Most survey respondents who worked with one of the administrator organizations were satisfied with the experience.

The following recommendations are offered to support ongoing program improvements:

- **Monitor Future Program Activity:** Although 2012 was an active year for the Mercantile Customer Program and most savings were generated from older projects, it may be more difficult for the program to generate savings over the longer term. At some point the program may work through the pool of potential participants. The Companies' program staff should continue to monitor the level of program activity with this in mind.
- **Continue ADM Review of Large Projects with Uncertain Savings:** There is a higher level of uncertainty in the estimation of ex ante savings for some measure types, such as HVAC, refrigeration, VFD, and process improvements, than for other measures, such as lighting. This uncertainty may lead to ex ante savings that are

higher than ex post savings and to a correspondingly lower realization rate. For these types of measures, in cases where the savings are potentially large, it is recommended that program staff have ADM review the project and the ex ante savings estimates. This review will aid in the early identification and correction of potential overestimation of ex ante savings and help to ensure a greater realization rate for the program.

Moreover, program staff should incorporate fields into the tracking database that indicate whether or not a project was sent to the evaluator for review and the evaluators comments on the project.

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 2012 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 2012 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.

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, since January 1, 2006, implemented projects 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. Customers participating in the Mercantile Customer Program chose to file jointly with the Companies.

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 that was legislated in SB 221. 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 new utility program. The rebates 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.
- 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.

The expected gross savings by measure type are shown in Table 3-1. There were 209 dockets in the program which were expected to provide savings of 118,272,184 kWh. Figure 3-1 shows the program's ex post kWh savings by date of implementation.

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

<i>Operating Company</i>	<i>Ex Ante kWh Savings</i>
CEI	48,967,066
OE	33,206,136
TE	36,098,982
Total Companies	118,272,184

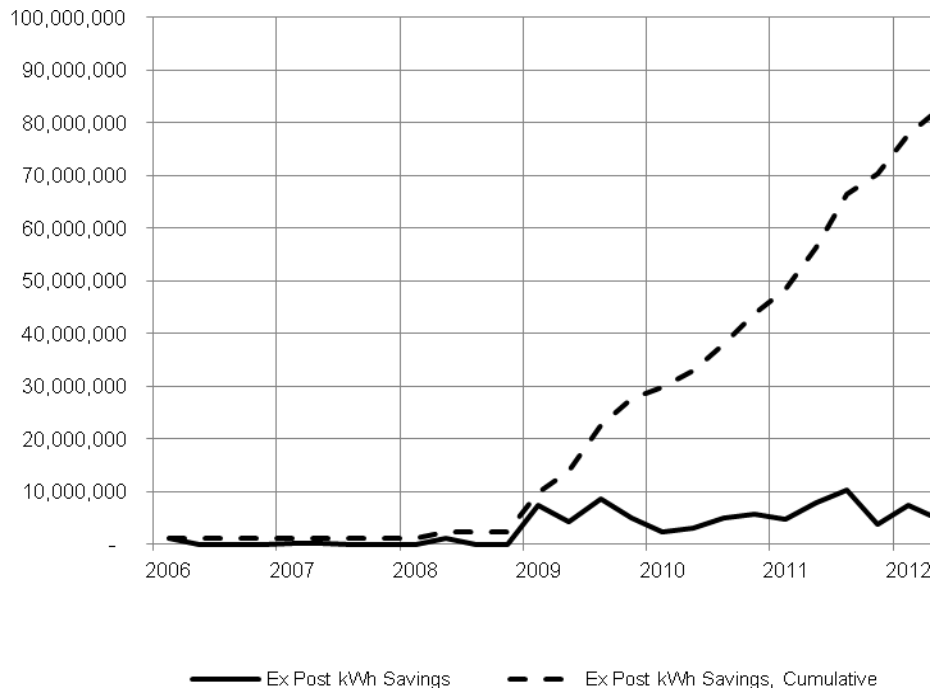


Figure 3-1. Mercantile Customer Program Expected Savings by Implementation Date

4. Methodology

ADM's evaluation of the 2012 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 4.4.2 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 2012 program year. Data provided by the Companies program staff showed that during 2012, there were 209 dockets associated with the program, which were expected to provide savings of 118,272,184 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 $\pm 10\%$.

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)	< 165040	165040 - 341489	341490 - 519999	520000 - 1521799	> 1521800	
Number of projects	78	51	16	47	17	209
Total kWh savings	6,253,573	11,886,289	6,860,121	41,051,777	52,220,424	118,272,184
Average kWh Savings	80,174	233,064	428,758	873,442	3,071,790	565,896
Standard deviation of kWh savings	45,232	49,473	61,524	310,557	2,076,808	1,003,199

	<i>Stratum 1</i>	<i>Stratum 2</i>	<i>Stratum 3</i>	<i>Stratum 4</i>	<i>Stratum 5</i>	<i>Totals</i>
Coefficient of variation	0.56	0.21	0.14	0.36	0.68	1.77
Final design sample	1	2	4	11	13	31

As shown in Table 4-2, the sample projects account for approximately 43% of the expected kWh savings.

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

<i>Stratum</i>	<i>Ex Ante kWh Savings (Population)</i>	<i>Ex Ante kWh Savings (Sample)</i>	<i>Percent of Ex Ante Peak kWh Savings in Sample</i>
5	52,220,424	38,253,024	73%
4	41,051,777	10,701,150	26%
3	6,860,121	1,802,611	26%
2	11,886,289	538,132	5%
1	6,253,573	95,113	2%
Total	118,272,184	51,390,030	43%

As shown in Table 4-3, the sample projects account for approximately 42% of the expected peak kW savings.

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

<i>Stratum</i>	<i>Ex Ante Peak kW Savings (Population)</i>	<i>Ex Ante Peak kW Savings (Sample)</i>	<i>Percent of Ex Ante Peak kW Savings in Sample</i>
5	7,099.16	5,057.16	71%
4	5,248.70	1,655.10	32%
3	866.92	352.00	41%
2	2,415.97	53.00	2%
1	1,332.04	25.10	2%
Total	16,962.78	7,142.36	42%

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

<i>Type of Measure</i>	<i>Method to Determine Savings</i>
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.

<i>Type of Measure</i>	<i>Method to Determine Savings</i>
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 rates¹ 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.

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.

¹The 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).

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:

$$\text{Peak Demand Savings} = \text{kW}_{\text{Before}} - \text{kW}_{\text{After}}$$

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:

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

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. The HVAC simulations also allow calculation of the primary and secondary effects of lighting measures on energy use. 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:

$$\text{Peak Demand Savings} = \text{kW}_{\text{peak}} \times (1/\text{Eff}_{\text{old}} - 1/\text{Eff}_{\text{new}})$$

where $\text{kW}_{\text{peak}} = \text{Volts} \times \text{Amps}_{\text{peak}} \times \text{Power Factor}$, and $\text{Amps}_{\text{peak}}$ is the interval with the maximum recorded Amps during the monitoring period

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

where $\text{kW}_{\text{ave}} = \text{Volts} \times \text{Amps}_{\text{ave}} \times \text{Power Factor}$ and Amps_{ave} is the average measured Amps for the duration of the monitored period.

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

where $\text{kW}_{\text{ave}} = \text{Volts} \times \text{Amps}_{\text{ave}} \times \text{Power Factor}$ 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.²

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

² Current year weather data were compared with the *Typical Meteorological Year* from the National Oceanic & Atmospheric Administration (NOAA)

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.³

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 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

³As 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:

$$\text{Derating factor} = (\text{RPM}_{\text{old}})^2 / (\text{RPM}_{\text{new}})^2 = 1760^2 / 1770^2 = 0.989$$

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.

ADM used AirMaster+ to calculate the savings due to the energy efficiency measures installed within each compressed air system. The AirMaster+ as-built and baseline compressor types were inputted into the model using data points collected during on-site verification. The as-built model was then calibrated to a typical daily schedule, derived from at least two weeks of trending data. Project energy savings were calculated by subtracting the as-built from the baseline energy consumption.

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 2012 program year.

Key research questions to be addressed by this evaluation of 2012 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 2012 Mercantile Customer Program

5.1 Impact Evaluation Findings

This section provides the results of gross savings for the Mercantile Customer Program during the 2012 Program year.

5.1.1 Realized Gross kWh Savings

The gross kWh savings of the 2012 Mercantile Customer Program are summarized by sampling stratum in Table 5-1. Overall, the achieved gross savings of 91,606,590 kWh were equal to 77% 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

<i>Stratum</i>	<i>Ex Ante kWh Savings</i>	<i>Ex Post kWh Savings</i>	<i>Realization Rate</i>
5	52,220,424	33,967,954	65%
4	41,051,777	35,740,321	87%
3	6,860,121	8,529,983	124%
2	11,886,289	6,643,866	56%
1	6,253,573	6,724,466	108%
Total	118,272,184	91,606,590	77%

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

<i>PUCO Docket ID</i>	<i>Ex Ante kWh Savings</i>	<i>Ex Post kWh Savings</i>	<i>Realization Rate</i>
12-0228	619,381	588,314	95%
12-1747	333,930	150,088	45%
12-2439	718,108	840,445	117%
12-1711	1,063,494	953,147	90%
12-2141	1,105,107	1,347,559	122%
12-2136	905,838	315,829	35%
12-2550	3,298,661	2,542,006	77%
12-2510	1,555,963	1,555,963	100%
12-2318	2,676,328	2,477,842	93%
12-2727	2,146,318	2,052,680	96%
12-2048	575,965	210,919	37%
12-0819	1,552,174	863,527	56%
12-1499	204,202	150,702	74%
12-0039	653,807	661,786	101%
13-0067	3,738,228	2,840,172	76%

<i>PUCO Docket ID</i>	<i>Ex Ante kWh Savings</i>	<i>Ex Post kWh Savings</i>	<i>Realization Rate</i>
12-2095	478,909	476,986	100%
12-1229	1,240,726	1,002,513	81%
12-2242	1,941,217	1,929,550	99%
12-2243	2,090,659	2,048,346	98%
12-2250	2,575,034	1,761,734	68%
12-2245	2,063,825	2,026,176	98%
12-2247	1,682,696	1,488,797	88%
12-2350	489,030	375,705	77%
12-2149	456,302	380,003	83%
12-2965	378,370	1,008,701	267%
12-0243	6,472,721	2,045,689	32%
12-3056	1,331,644	1,318,665	99%
12-1650	95,113	102,275	108%
12-2307	1,453,578	1,843,119	127%
12-2935	1,033,502	234,293	23%
13-0449	6,459,200	1,250,061	19%
Non-Sample Dockets	66,882,154	54,762,998	82%
Total	118,272,184	91,606,590	77%

Gross realized kWh savings of the Mercantile Equipment Program are shown by building type in Table 5-3. Among discrete building types, educational services facilities account for the largest percentage of incentive gross energy – 20.7%.

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

<i>Facility Type</i>	<i>Ex Post kWh Savings</i>	<i>Percent of Total Ex Post kWh Savings</i>
Educational Services	18,994,693	20.7%
General Merchandise Stores	10,168,253	11.1%
Hospitals	9,663,017	10.5%
Other	7,349,099	8.0%
Transportation Equipment Manufacturing	6,342,364	6.9%
Food and Beverage Stores	4,598,108	5.0%
Utilities	4,142,330	4.5%
Food Manufacturing	3,395,916	3.7%
Fabricated Metal Product Manufacturing	2,698,762	2.9%
Nursing and Residential Care Facilities	2,606,619	2.8%
Real Estate	2,233,939	2.4%
Transit and Ground Passenger Transportation	1,930,500	2.1%
Chemical Manufacturing	1,739,754	1.9%
Nonmetallic Mineral Product Manufacturing	1,690,065	1.8%
Miscellaneous Manufacturing	1,426,744	1.6%

<i>Facility Type</i>	<i>Ex Post kWh Savings</i>	<i>Percent of Total Ex Post kWh Savings</i>
Performing Arts, Spectator Sports, and Related Industries	1,268,499	1.4%
Health and Personal Care Stores	1,118,801	1.2%
Telecommunications	924,769	1.0%
Plastics and Rubber Products Manufacturing	917,085	1.0%
Textile Product Mills	863,232	0.9%
Furniture and Related Product Manufacturing	832,389	0.9%
Amusement, Gambling, and Recreation Industries	809,999	0.9%
Merchant Wholesalers, Durable Goods	612,173	0.7%
Truck Transportation	598,767	0.7%
Support Activities for Transportation	588,314	0.6%
Paper Manufacturing	522,056	0.6%
Insurance Carriers and Related Activities	465,305	0.5%
Machinery Manufacturing	411,336	0.4%
Miscellaneous Store Retailers	399,030	0.4%
Credit Intermediation and Related Activities	274,289	0.3%
Sporting Goods, Hobby, Book, and Music Stores	217,634	0.2%
Administration of Environmental Quality Programs	166,790	0.2%
Electronics and Appliance Stores	166,712	0.2%
Primary Metal Manufacturing	158,400	0.2%
Waste Management and Remediation Services	149,643	0.2%
Wood Product Manufacturing	143,914	0.2%
Publishing Industries (except Internet)	134,057	0.1%
Data Processing, Hosting and Related Services	127,490	0.1%
Museums, Historical Sites, and Similar Institutions	111,874	0.1%
Apparel Manufacturing	104,161	0.1%
Building Material and Garden Equipment and Supplies Dealers	96,538	0.1%
Merchant Wholesalers, Nondurable Goods	94,023	0.1%
Printing and Related Support Activities	90,922	0.1%
Construction of Buildings	89,736	0.1%
Professional, Scientific, and Technical Services	82,130	0.1%
Executive, Legislative, and Other General Government Support	55,141	0.1%
Rental and Leasing Services	31,216	0.0%
Total	91,606,590	100.0%

5.1.2 Realized GrossPeak kW Savings

The realized gross peak kW reductions of the 2012 Mercantile Customer Program are shown in Table 5-4. The achieved gross peak demand savings for the program are 18,010.04 kW.

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

<i>Stratum</i>	<i>Ex Ante Peak kW Savings</i>	<i>Ex Post Peak kW Savings</i>	<i>Realization Rate</i>
5	7,099.16	6,772.19	95%
4	5,248.70	5,193.96	99%
3	866.92	1,134.21	131%
2	2,415.97	3,269.31	135%
1	1,332.04	1,640.37	123%
Total	16,962.78	18,010.04	106%

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.

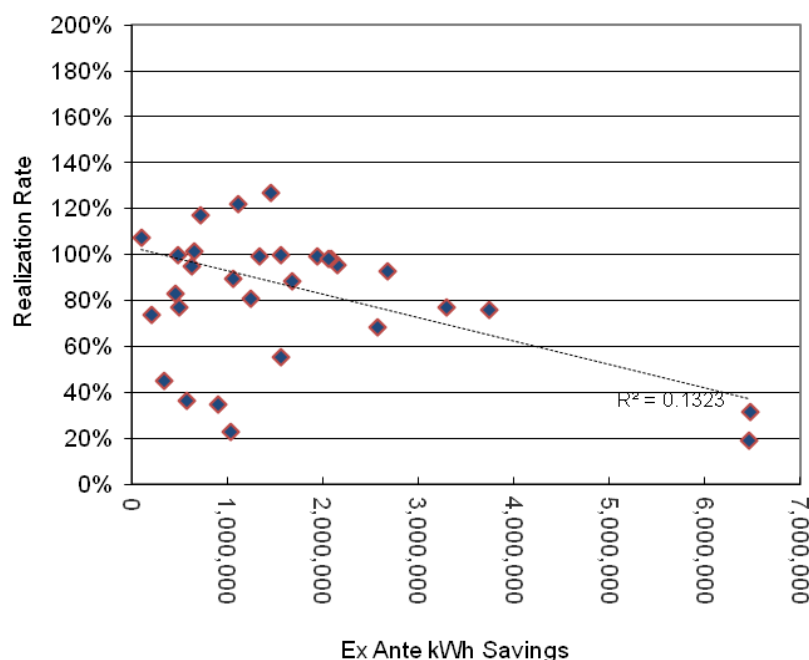


Figure 5-1. Sample Project Realization Rate versus Expected kWh Savings for the Mercantile Customer Program

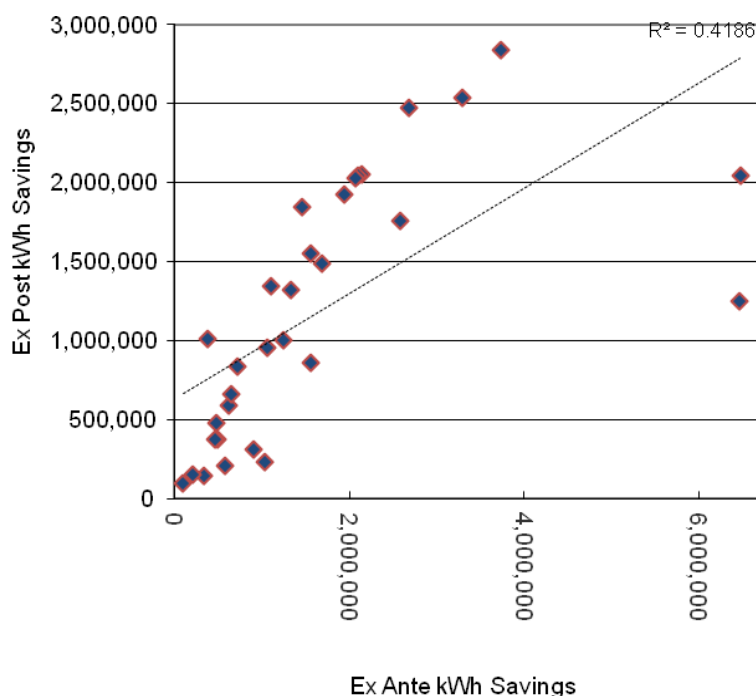


Figure 5-2 Sample Project Ex Post kWh Savings versus Ex Ante kWh Savings for the Mercantile Customer Program

5.2 Process Evaluation Findings

This section presents the results of the process evaluation for the Companies' Mercantile Customer Program during the 2012 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 customers, the Companies' program 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 interviews of customer participants and program operations staff.

5.2.1 Summary of Primary Data Collection

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.

5.2.2 Summary of Conclusions and Recommendations

The interviews and surveys that were conducted provided a perspective on program operations and effectiveness during the 2012 program year. The following presents a selection of key conclusions 2012:

- **High Program Satisfaction:** The majority of participants were very satisfied with their overall experience with the program, although some expressed dissatisfaction with the application process. Sixteen percent of participants were either dissatisfied or very dissatisfied with the effort required to apply for the incentives or with the application forms. Additionally, nearly a third of participants were somewhat or very dissatisfied with the time required to receive incentives. Program staff is aware of the dissatisfaction with the length of time required to receive the incentive.
- **Preference for Cash Incentive over Rider Exemption:** A large share of the 2012 savings came from participants who elected to receive the cash incentive (72%) over the rider exemption (28%). Furthermore, a larger share of those who completed projects in 2012 chose the cash incentive instead of the rider exemption compared to those who completed projects in prior years. This may have occurred because projects completed in these years were motivated by the program whereas older projects were completed by customers on their own initiative. Participants motivated by the program may be more concerned with quickly recouping their costs through the incentive. Analysis of the reasons for electing the cash incentives found that most participants chose the cash incentive because they thought it offered a better rate of return than the exemption.
- **Most Savings from Older Projects:** Most of the savings achieved during 2012 came from projects completed prior to 2012. Although the generation of savings from older projects suggests that the Mercantile Customer Program's ability to generate savings in the future may diminish, similar results were found last year. Consequently, the program seems to be able to sustain savings activity from projects that were completed in prior years.
- **Manufacturing and Industrial Firms Account for Smaller Share of Savings than in 2011:** Approximately 24% of the 2012 savings accrued through the program were from manufacturing whereas approximately half of the 2011 savings came from manufacturing firms.
- **Customers Satisfied with Administrator Organizations:** In addition to promoting the program, the administrator organizations help participants file applications. Most survey respondents who worked with one of the administrator organizations were satisfied with the experience.

The following recommendations are offered to support ongoing program improvements:

- **Monitor Future Program Activity:** Although 2012 was an active year for the Mercantile Customer Program and like last year, most savings were generated from older projects, it may be more difficult for the program to generate savings over the longer term. At some point the program may work through the pool of potential participants. The Companies' program staff should continue to monitor the level of program activity with this in mind.
- **Continue ADM Review of Large Projects with Uncertain Savings:** There is a higher level of uncertainty in the estimation of ex ante savings for some measure types, such as HVAC, refrigeration, VFD, and process improvements, than for other measures, such as lighting. This uncertainty may lead to ex ante savings that are higher than ex post savings and to a correspondingly lower realization rate. For these types of measures, in cases where the savings are potentially large, it is recommended that program staff have ADM review the project and the ex ante savings estimates. This review will aid in the early identification and correction of potential overestimation of ex ante savings and help to ensure a greater realization rate for the program.

Moreover, program staff should incorporate fields into the tracking database that indicate whether or not a project was sent to the evaluator for review and the evaluators comments on the project.

5.2.3 Mercantile Customer Program Participant Profile

Mercantile Customer Program participants implemented a variety of measures as shown in Table 5-5. The most frequently implemented measure was lighting equipment, which accounted for 42% of the measures. HVAC measures were the next most commonly implemented measure which accounting for 15% of the measures during the program year. Only nine process improvement projects were implemented during the program year.

Table 5-5 Number and Percent of Measure Type Implemented During 2012

	<i>Count of Measure Types Implemented</i>	<i>Percent of Measure Types Implemented</i>
Lighting	299	42%
HVAC	109	15%
Motor	88	12%
Controls	79	11%
Refrigeration	33	5%
Air compressor	11	2%
Process improvement	9	1%
Other	86	12%

Participants in the program could elect to receive either a cash incentive or an exemption from the DSE2 rider. Figure 5-3 shows the savings associated with projects by customers who elected to receive the cash incentive or the rider exemption by the year that the project was implemented. As was the case last year, most of the energy

savings during 2012 were associated with customers who chose the cash incentive option over the rider exemption.

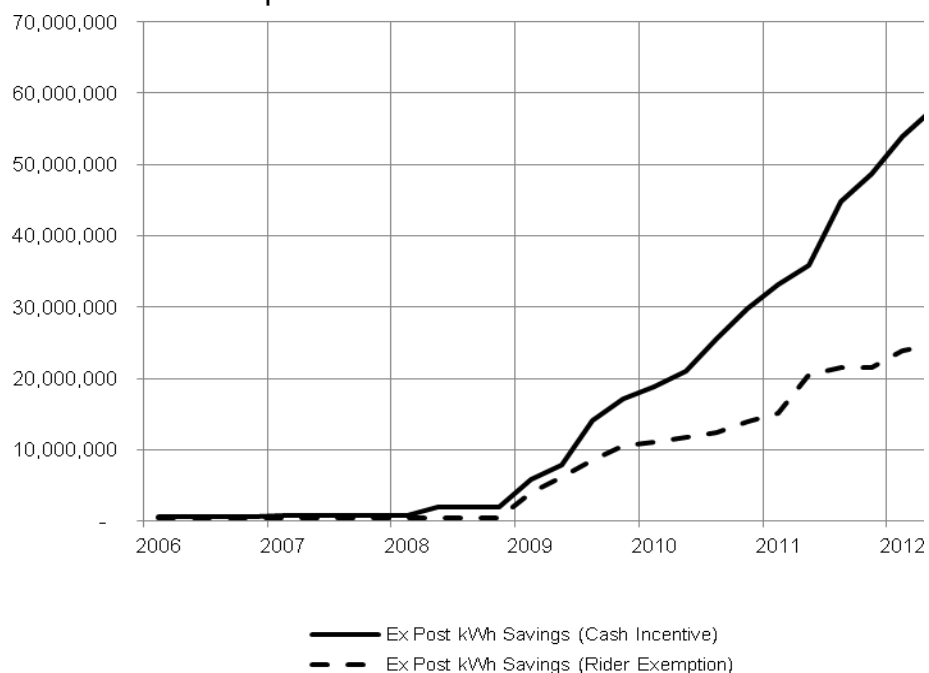


Figure 5-3 Energy Savings for Cash Incentive and Rider Exemption Options by Year Project was Implemented

The share of savings associated with cash incentive projects by the year that the project was implemented is shown in Figure 5-4. The share of projects for which the customer received a cash incentive varied by the year the project was completed. All of the projects completed in 2007 and 2008 received a cash incentive and approximately 60% of the projects completed in 2006 and 2009 received a cash incentive.

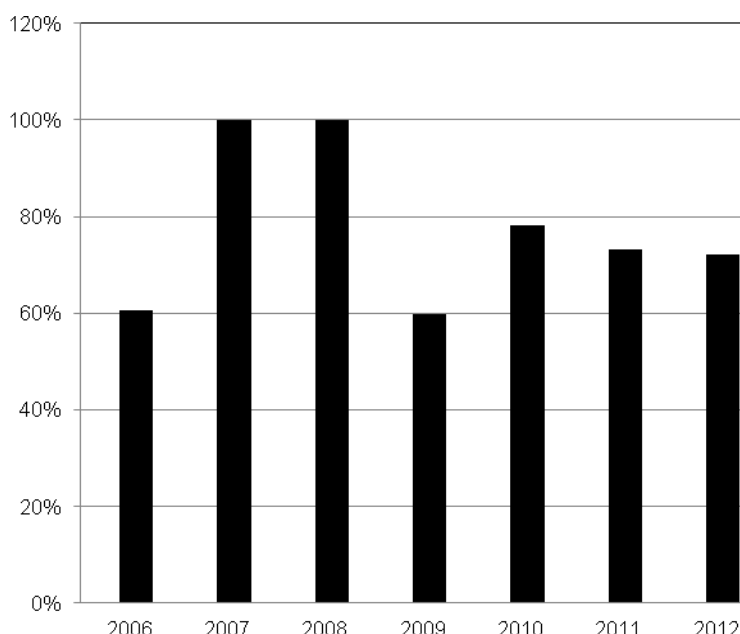


Figure 5-4 Energy Savings Associated with Projects that Elected the Cash Incentive by Year Project was Implemented

5.2.4 Mercantile Customer Program Participant Outcomes

An online 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 project from a variety list of measures, including lighting, HVAC, motors, air compressors, controls, refrigeration, and process improvements. Commercial and industrial customers are eligible to participate if they used more than 700,000 kWh per year. In total, 57 customers who implemented a project under the program responded to the survey. In the following tables, the percent of respondents and percent of ex post kWh savings associated with responses are shown. Most of the discussion focuses on the percent of respondents, although the percent of savings is discussed where it is noteworthy. As shown in Table, seventy-five percent of the respondents were the main decision maker.

Table 5-6 Respondents Role in the Decision Making Process

	Response	(n=57)	Percent of Respondents	Percent of Ex Post kWh Savings
Who was the main decision maker to implement [project description]?	I was the main decision maker	43	75%	79%
	Someone else was the main decision maker	14	25%	21%

5.2.5 How Customers Learn About the Program

Customers were asked how they learned about the Mercantile Customer Program. As shown in Table, the most common way customers learned about the program was from an equipment vendor or building contractor. Additionally, a sizable share of respondents, 19%, heard about the program from a representative of an 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. Twenty-three percent of respondents reported hearing of the program from other sources. These sources included state offices, a diocese, and an OE Webinar.

Table 5-7 How Customers Learned about the Mercantile Customer Program

	<i>Response</i>	<i>(n=57)</i>	<i>Percent of Respondents</i>	<i>Percent of Ex Post kWh Savings</i>
How did you learn of [EDC]'s Mercantile Customer Program?	Approached directly by representative of [EDC] incentive programs	10	18%	29%
	Received an information brochure on [EDC] incentive programs	5	9%	3%
	Representative of [EDC] mentioned it	11	19%	16%
	[EDC] website	1	2%	0%
	Friends or colleagues	4	7%	6%
	An architect, engineer or energy consultant	13	23%	24%
	An equipment vendor or building contractor	14	25%	11%
	Past experience with the programs	5	9%	2%
	Other (please explain)	13	23%	27%

The sources from which customers reported learning of the Mercantile Customer Program during 2012 were similar to the sources from which they learned of the program during 2011.

The share of respondents who heard about the program from an EDC representative or from the EDC website is shown for each EDC in Table 5-8. A larger share of customers from CEI heard of the program from an EDC representative. A larger share of respondents from each EDC heard about the program from a representative of their EDC than from the EDC website.

Table 5-8 EDC Sources for Learning about the Program by EDC

	<i>Response</i>	<i>OE (n=24)</i>	<i>TE (n=20)</i>	<i>CEI (n=14)</i>
How did you learn of [EDC]'s Mercantile Customer Program?	Approached directly by representative of [EDC] incentive programs	13%	15%	29%

	<i>Response</i>	<i>OE (n=24)</i>	<i>TE (n=20)</i>	<i>CEI (n=14)</i>
	Received an information brochure on [EDC] incentive programs	8%	10%	7%
	Representative of [EDC] mentioned it	13%	20%	36%
	[EDC] website	0%	0%	7%
	Friends or colleagues	13%	0%	7%
	An architect, engineer or energy consultant	21%	20%	14%
	An equipment vendor or building contractor	25%	30%	14%
	Past experience with the programs	13%	10%	0%
	Other (please explain)	29%	35%	14%

5.2.6 The Decision Makers

Table 5-9 displays participant responses regarding how their organizations typically make decisions about energy efficiency improvements. Respondents most frequently reported that decisions were made by one or two key people. Other common responses were that the decision is made based on staff recommendations to a decision maker and that how the decision is made depends on how much the investment.

Table 5-9 Decision Maker Characteristics

	<i>Response</i>	<i>(n=57)</i>	<i>Percent of Respondents</i>	<i>Percent of Ex Post kWh Savings</i>
How does your organization typically decide to make energy efficiency improvements for this facility? Is the decision:	Made by one or two key people	20	35%	22%
	Based on staff recommendations to a decision maker	6	11%	17%
	Made by a group or committee	17	30%	47%
	Made in some other way	1	2%	2%
	Depends on how much the investment is	13	23%	12%
	Don't know	0	0%	0%

5.2.7 Where Decision Makers Get Their Information

To understand how customers find out about energy efficiency improvements, respondents were asked where they get information about energy efficient equipment, materials, and design features. The results are shown in Table 5-10. As was the case during 2011, 2012 decision makers most heavily relied upon equipment vendors or building contractors (53%), architect, engineer or energy consultant (47%), customer service representatives (28%), and trade journals or magazines, and brochures or

advertisements (12%). Between 11% and 19% of the respondents get information from the EDC website, from trade associations or business groups, and other sources.

Table 5-10 Where Decision Makers get Information about Energy Efficient Equipment, Materials, and Design Features

	<i>Response</i>	<i>(n=57)</i>	<i>Percent of Respondents</i>	<i>Percent of Ex Post kWh Savings</i>
What are the sources your organization relies on for information about energy efficient equipment, materials, and design features?	[EDC] Customer Service Representative	16	28%	22%
	[EDC] website	6	11%	3%
	Brochures or advertisements	8	14%	13%
	Trade associations or business groups you belong to	7	12%	28%
	Trade journals or magazines	9	16%	26%
	Friends and colleagues	6	11%	24%
	An architect, engineer or energy consultant	27	47%	57%
	Equipment vendors or building contractors	30	53%	56%
	Other	11	19%	13%

Respondents' use of EDC resources for information about energy efficient equipment, materials, and design features are shown in Table 5-11 for each of the EDCs. A larger share of respondents served by TE and CEI relied upon EDC resources than respondents served by OE.

Table 5-11 Utilization of EDC Resources for Information about Energy Efficient Equipment, Materials, and Design Features by EDC

	<i>Response</i>	<i>OE (n=24)</i>	<i>TE (n=20)</i>	<i>CEI (n=14)</i>
What are the sources your organization relies on for information about energy efficient equipment, materials, and design features?	[EDC] Customer Service Representative	17%	35%	36%
	[EDC] website	13%	5%	14%
	Brochures or advertisements	17%	10%	14%
	Trade associations or business groups you belong to	25%	5%	7%
	Trade journals or magazines	25%	5%	21%
	Friends and colleagues	17%	0%	14%
	An architect, engineer or energy consultant	38%	55%	50%
	Equipment vendors or building contractors	50%	50%	57%
	Other	29%	25%	14%

5.2.8 Energy Efficiency Attitudes, Behaviors, and Decision Making

To understand what factors customers consider when deciding to make energy efficiency improvements, we asked several questions about organizational procedures and policies, the importance of different considerations for decision making, and their past experience with energy efficient equipment.

Respondents' use of policies and procedures regarding energy efficiency improvements in their organizations is shown in Table 5-12. Forty-two percent of respondents' organizations had policies that incorporate energy efficiency in operations and procurement. Thirty-nine percent of respondents said they had an energy management plan, but that share of kWh savings was nearly two-thirds because respondents' projects that resulted in larger savings were more likely to have an energy management plan. Additionally, a little less than a third of respondents said they had a numeric goal for energy savings. Several respondents also said they had a numeric goal for energy cost reduction (39%) or active training of staff (32%). Eleven percent of respondents said they did not have any energy efficiency policies or procedures in place. That share dropped to 3% for the share of savings because firms with larger energy savings were less likely to not have any policies or procedures regarding energy efficiency improvements.

Table 5-12 Policies and Procedures Regarding Energy Efficiency Improvements

	<i>Response</i>	<i>(n=57)</i>	<i>Percent of Respondents</i>	<i>Percent of Ex Post kWh Savings</i>
Which of the following policies or procedures does your organization have in place regarding energy efficiency improvements at this facility?	An energy management plan	22	39%	57%
	Corporate policies that incorporate energy efficiency in operations and procurement	24	42%	65%
	Active training of staff	18	32%	43%
	A numeric goal for energy savings	18	32%	52%
	A numeric goal for energy cost reduction	22	39%	55%
	Other	7	12%	5%
	None	6	11%	2%

Respondents were asked to rate a list of factors in terms of importance for their decision making about energy efficiency improvements. The percent of respondents and the percent of ex post kWh savings associated with responses is shown in Table 5-13 and Table 5-14, respectively. Although the Mercantile Customer Program differs from a traditional incentive program in that its purpose is to compensate customers for energy reduction steps taken on their own instead of offering incentives to motivate efficiency improvements, respondents still considered incentive payments from their EDC to be the most important factor. Specifically, 63% of respondents said incentive payments

were very important and 21% said they were somewhat important. The least important factor was advice and/or recommendations from equipment vendors although 77% of respondents thought advice and/or recommendations were very important or somewhat important.

Table 5-13 Factors Influencing the Decision to Implement Energy Efficiency Improvements, Percent of Respondents

<i>Energy Efficiency Decision Factor</i>	<i>Very important</i>	<i>Somewhat important</i>	<i>Only slightly important</i>	<i>Not important at all</i>	<i>Don't know</i>	<i>n</i>
Incentive payments from [EDC]	63%	21%	12%	2%	2%	57
Past experience with energy efficient equipment	65%	30%	5%	0%	0%	57
Advice and/or recommendations from [EDC]	46%	33%	14%	5%	2%	57
Advice and/or recommendations from equipment vendors	42%	35%	23%	0%	0%	57

Table 5-14 Factors Influencing the Decision to Implement Energy Efficiency Improvements, Percent of Ex Post kWh Savings

<i>Energy Efficiency Decision Factor</i>	<i>Very important</i>	<i>Somewhat important</i>	<i>Only slightly important</i>	<i>Not important at all</i>	<i>Don't know</i>	<i>n</i>
Incentive payments from [EDC]	61%	28%	10%	1%	0%	57
Past experience with energy efficient equipment	66%	30%	1%	0%	0%	57
Advice and/or recommendations from [EDC]	34%	36%	24%	6%	0%	57
Advice and/or recommendations from equipment vendors	38%	38%	24%	0%	0%	57

Participants in the business incentive programs were asked whether or not they had implemented any energy efficient equipment measures before participating in the Mercantile Customer Program. As shown in Table 5-15, 42% of respondents said they had previously implemented similar equipment and most said they had not received an incentive to do so.

Table 5-15 Previous Experience with Similar Energy Efficient Equipment or Measures

	<i>Response</i>	<i>(n=57)</i>	<i>Percent of Respondents</i>	<i>Percent of Ex Post kWh Savings</i>
Before participating in [EDC]'s Mercantile	Yes	24	42%	60%

	<i>Response</i>	<i>(n=57)</i>	<i>Percent of Respondents</i>	<i>Percent of Ex Post kWh Savings</i>
Customer Program, had you installed any equipment or measure similar to the energy efficient [energy efficient equipment/measure] at this facility?	No	27	47%	33%
	Don't Know	6	11%	7%

5.2.9 Financial Methods Used by Decision Makers

Nearly all decision makers said they used some type of financial method to evaluate energy efficiency improvements. Simple payback was the most commonly mentioned method with 58% of the respondents saying that is how they evaluate energy efficiency improvements. Another common method, the internal rate of return for the project, was used by 47% of participants and life cycle costs, used by 42% of the participants. The projects initial cost was also used by several participants (37%). These responses show the importance of financial considerations in making decisions about energy efficiency improvements.

In comparison to findings for 2011, a smaller share of customers reported using simple payback. However, in both years this was the most commonly used financial method.

Table 5-16 Financial Methods to Evaluate Energy Efficiency Improvements

	<i>Response</i>	<i>(n=57)</i>	<i>Percent of Respondents</i>	<i>Percent of Ex Post kWh Savings</i>
Which financial methods does your organization typically use to evaluate energy efficiency improvements for this facility?	Initial Cost	21	37%	24%
	Simple payback	33	58%	59%
	Internal rate of return	27	47%	49%
	Life cycle cost	24	42%	40%
	None of these	0	0%	0%
	Don't know	0	0%	0%

Figure 5-5 shows the payback period that respondents said they require. These responses suggest that many of the respondents firms require moderate to long payback periods when evaluating efficiency projects. More than half of respondents required payback periods of three years or more and 21% required a payback period of 5 years or more.

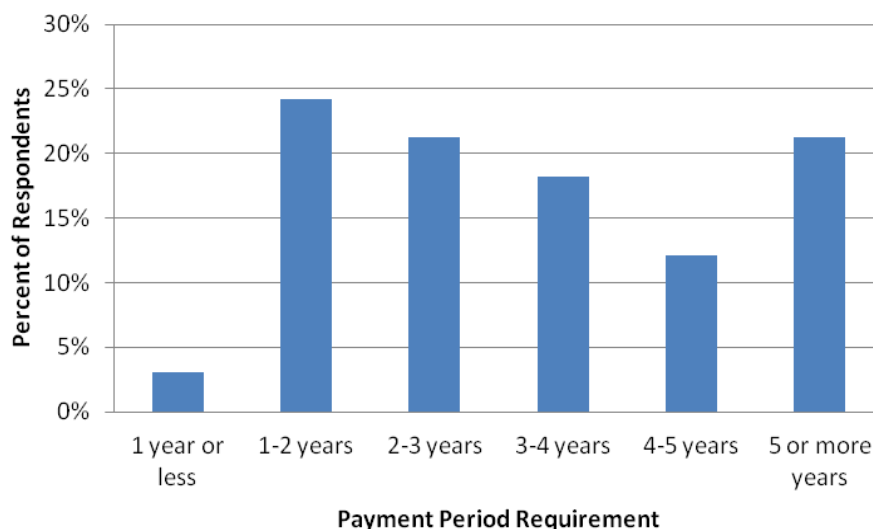


Figure 5-5 (Required Payback Period (n=33))

5.2.10 Choice of Incentive or Rider Exemption

Most survey respondents received the cash incentive (72%) instead of the rider exemption (28%). Furthermore, an analysis of ex post kWh savings found that a larger share of savings was associated with applicants who chose the cash incentive over the rider exemption.

To further understand participants' reasons for choosing the cash incentive over the rider exemption, responses to questions on energy efficiency decision making were cross-tabulated with participants' choice of cash incentive or rider exemption. Table 5-17 shows that when evaluating efficiency improvements, customers who elected to receive the rider exemption or cash incentive did not differ substantially in their use of the initial cost or simple payback to evaluate energy efficiency improvements.

Table 5-17 Financial Method for Evaluating Energy Efficiency Improvements by Incentive Type

	Response	Cash Incentive	Rider Exemption
Which financial methods does your organization typically use to evaluate energy efficiency improvements for this facility?	Initial Cost	36%	38%
	Simple payback	56%	62%
	Internal rate of return	51%	33%
	Life cycle cost	33%	57%
	None of these	0%	0%
	Don't know	0%	0%

Table 5-18 shows the somewhat greater importance given to incentive payments for participants who elected to receive the cash incentive.

Overall, these findings suggest that there are few differences in methods used to evaluate energy efficiency projects or the importance given to incentive payments between customers who elected to receive the cash incentive or the rider exemption.

Table 5-18 Importance of Incentive Payments by Incentive Type

	<i>Response</i>	<i>Cash Incentive</i>	<i>Rider Exemption</i>
How important are incentive payments from [EDC] for your decision making regarding energy efficiency improvements?	Very important	67%	57%
	Somewhat important	18%	24%
	Only slightly important	13%	10%
	Not important at all	3%	0%
	Don't know	0%	10%

5.2.11 Reasons for Participating in the Mercantile Customer Program

Survey respondents were asked if they were aware of the C/I Equipment Programs implemented by SAIC and if so, why they opted to apply to the Mercantile Customer Program instead of the SAIC implemented programs. Sixty-one percent of the survey respondents indicated that they were aware of the other programs. Several of these respondents stated that they applied to the Mercantile Customer Program because they were not eligible for the SAIC implemented programs. However, a few respondents stated that they applied to the Mercantile Customer Program because the incentives were better or because they thought the application process was easier. Additionally, two respondents who received the rider exemption stated they applied to the mercantile program to avoid future utility payments.

5.2.12 Administrator Organizations

The Mercantile Customer Program is primarily marketed through nine administrator organizations and customers applying to the mercantile program have the option of working through one of them. As shown in Table 5-19, more than two-thirds 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 followed by the utility regional customer service and the Ohio Hospital Association.

Table 5-19 Administrator Organizations

	<i>Response</i>	<i>(n=57)</i>	<i>Percent of Respondents</i>	<i>Percent of Ex Post kWh Savings</i>
Which of the following organizations did you work with when you participated in the Mercantile Customer Program?	Utility regional customer service	7	12%	12%
	Industrial Energy Users – Ohio	3	5%	11%
	Ohio Manufacturer's	3	5%	3%

	<i>Response</i>	<i>(n=57)</i>	<i>Percent of Respondents</i>	<i>Percent of Ex Post kWh Savings</i>
	Association			
	Ohio Hospitals Association	4	7%	9%
	Ohio Schools Council	1	2%	2%
	The E-Group	2	4%	1%
	Roth Brothers	10	18%	21%
	County Commissioners' Association of Ohio	2	4%	6%
	Association of Independent Colleges & Universities	0	0%	0%
	Did not work with any of these organizations	18	32%	21%

Respondents who worked with one of these organizations were asked how satisfied they were with that experience. As shown in Table 5-20, nearly all respondents were very satisfied or satisfied (84%). Only one respondent was dissatisfied with the experience because of a “complete failure with first company so we got another.” These findings suggest that from the customer perspective, the use of the administrator organizations to assist with the application process is generally effective. The level of satisfaction in working with the administrator organizations was similar to what 2011 survey respondents reported.

Table 5-20 Satisfaction with Administrator Organizations

	<i>Response</i>	<i>(n=39)</i>	<i>Percent of Respondents</i>	<i>Percent of Ex Post kWh Savings</i>
How satisfied or dissatisfied were you with your experience in working with the organization?	Very Satisfied	20	51%	45%
	Somewhat Satisfied	13	33%	34%
	Neither Satisfied nor Dissatisfied	2	5%	10%
	Somewhat Dissatisfied	1	3%	2%
	Very Dissatisfied	1	3%	1%
	Don't know	2	5%	8%
	Average Rating*		3.4	3.1

5.2.13 Customer Satisfaction with the Program

Overall, customers were satisfied with the Mercantile Customer Program. Forty-nine percent of respondents said that they were very satisfied with their overall experience with the programs and another 28% said they were satisfied. Respondents were most satisfied with equipment that was installed and least satisfied with the time elapsed until the incentive payment was received. Twenty-eight percent of participants said that they were somewhat dissatisfied or very dissatisfied with the amount of time required to

receive the incentive checks. Respondents also expressed some dissatisfaction with the effort required for the application process and the application forms. About one-quarter of respondents were dissatisfied with the effort required for the application and 16% were dissatisfied with the forms.

Dissatisfied participants were asked to describe the reason for their dissatisfaction. Many of the specific reasons related to the application process or forms. Some of the respondents felt that the paperwork was burdensome and others noted that the instructions were unclear and required excessive information. A couple respondents indicated that the incentive had a long disbursement delay. A final issue mentioned by one respondent was that during the program execution, the initial program kept changing, which created too much uncertainty for the participant.

Table 5-21 Participant Satisfaction, Percent of Respondents

<i>Satisfaction Element</i>	<i>Very Satisfied</i>	<i>Somewhat Satisfied</i>	<i>Neither Satisfied nor Dissatisfied</i>	<i>Somewhat Dissatisfied</i>	<i>Very Dissatisfied</i>	<i>Don't know</i>
Performance of the equipment installed	88%	11%	2%	0%	0%	0%
Savings on your monthly bill	42%	35%	11%	0%	0%	12%
Incentive amount	39%	37%	5%	7%	2%	11%
The effort required for the application process	21%	35%	9%	12%	12%	11%
Information provided by [EDC] account representative	46%	23%	11%	2%	2%	18%
Elapsed time until you received the incentive -	18%	35%	12%	14%	14%	7%
Application forms	19%	37%	12%	9%	7%	16%
Application instructions	26%	33%	14%	9%	2%	16%
The overall experience with the programs	49%	28%	11%	4%	7%	2%

Table 5-22 Comparison of Satisfaction for 2011 and 2012

<i>Satisfaction Element</i>	<i>Percent of Respondents who were Very or Somewhat Satisfied</i>	
	<i>2012</i>	<i>2011</i>
Performance of the equipment installed	99%	96%
Savings on your monthly bill	77%	81%
Incentive amount	76%	83%
The effort required for the application process	56%	49%
Information provided by [EDC] account representative	69%	58%
Elapsed time until you received the incentive -	53%	39%
Application forms	56%	53%

Satisfaction Element	Percent of Respondents who were Very or Somewhat Satisfied	
	2012	2011
Application instructions	59%	53%
The overall experience with the programs	77%	75%

Table 5-23 Participant Satisfaction, Percent of Ex Post kWh Savings

Satisfaction Element	Very Satisfied	Somewhat Satisfied	Neither Satisfied nor Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied	Don't know
Performance of the equipment installed	80%	19%	1%	0%	0%	0%
Savings on your monthly bill	47%	36%	10%	0%	0%	7%
Incentive amount	24%	46%	6%	3%	1%	20%
The effort required for the application process	13%	35%	19%	9%	11%	13%
Information provided by [EDC] account representative	33%	22%	22%	1%	2%	21%
Elapsed time until you received the incentive -	7%	31%	27%	10%	16%	10%
Application forms	13%	34%	22%	2%	7%	22%
Application instructions	25%	26%	26%	8%	1%	15%
The overall experience with the programs	48%	29%	13%	1%	8%	0%

Table 5-24 displays the average level of satisfaction with the program overall and with different program elements, disaggregated by ex post kWh savings. Specifically, respondent's ex post kWh savings were stratified into quartiles. Those with the largest savings were placed into the first quartile and those with the smallest savings were placed into the fourth quartile. There was little evidence of a consistent relationship between satisfaction with the program overall or its aspects and the customers savings.

Table 5-24 Average Satisfaction Ratings by Ex Post kWh Savings

Satisfaction Element	Quartile 1 - Greatest Energy Savings	Quartile 2	Quartile 3	Quartile 4 - Least Energy Savings
Performance of the equipment installed	3.7	3.9	4.0	3.9
Savings on your monthly bill	2.9	3.5	3.6	2.7
The incentive/exemption amount	2.4	2.6	3.0	2.9
The effort required for the application process	1.4	2.6	1.7	2.3
Information provided by [EDC] Account Representative	2.0	2.8	2.4	2.9

<i>Satisfaction Element</i>	<i>Quartile 1 - Greatest Energy Savings</i>	<i>Quartile 2</i>	<i>Quartile 3</i>	<i>Quartile 4 - Least Energy Savings</i>
The elapsed time until your application was approved	1.4	1.9	2.0	2.4
The application forms	1.4	2.4	2.1	2.3
The application instructions	1.7	3.1	2.0	2.5
Overall experience with the program	2.9	3.4	3.7	2.9

The average satisfaction ratings for the program elements for customers serviced by each EDC are shown in Table 5-25. Satisfaction ratings did not vary substantially across customers of the different companies.

Table 5-25 Average Satisfaction Ratings by EDC

<i>Satisfaction Element</i>	<i>OE (n=24)</i>	<i>TE (n=20)</i>	<i>CEI (n=14)</i>
Performance of the equipment installed	3.9	3.8	3.9
Savings on your monthly bill	3.1	2.7	3.1
The incentive/exemption amount	3.0	3.1	2.3
The effort required for the application process	2.2	1.9	2.3
Information provided by [EDC] Account Representative	2.4	2.9	3.0
The elapsed time until your application was approved	2.2	2.3	2.1
The application forms	2.3	2.1	2.0
The application instructions	2.5	2.1	2.5
Overall experience with the program	3.0	3.3	3.0

Table 5-26 displays the average satisfaction ratings for 2012 and 2011 participants. As shown, satisfaction ratings were fairly consistent across the two years. Customers did report somewhat higher satisfaction with the information provided by account representatives and the application instructions.

Table 5-26 Comparison of Average 2012 and 2011 Satisfaction Ratings

<i>Satisfaction Element</i>	<i>2012</i>	<i>2011</i>
Performance of the equipment installed	3.9	3.8
Savings on your monthly bill	3.4	3.3
Incentive amount	3.2	3.1
The effort required for the application process	2.5	2.3

<i>Satisfaction Element</i>	<i>2012</i>	<i>2011</i>
Information provided by [EDC] account representative	3.3	2.9
Elapsed time until you received the incentive -	2.3	2.0
Application forms	2.6	2.3
Application instructions	2.9	2.5
The overall experience with the programs	3.1	2.9

*Average rating defined by weighting responses "Very Satisfied" = 4, "Somewhat Satisfied" = 3, "Neither Satisfied nor Dissatisfied" = 2, "Somewhat Dissatisfied" = 1, and "Very Dissatisfied" = 0, with "Don't know" answers excluded from the calculation.

5.2.14 Paperwork, Installation, and Incentives

As shown in Table 5-27 the majority of respondents said they did not have any issues or problems with the process required to receive the incentive or rider exemption. Of those who had issues or problems, most said that difficulty with the paperwork was the problem. Some of the issues noted by respondents were that they had to submit forms multiple times, that the paperwork was lengthy, or that the forms were confusing. Another frequently mentioned issue was that it took a long time to get the incentive or that they had not yet received it.

Table 5-27 Decision Maker Experience with the Process to Receive Incentives

	<i>Response</i>	<i>(n=57)</i>	<i>Percent of Respondents</i>	<i>Percent of Ex Post kWh Savings</i>
Did you have any issues or problems with the process required to receive the [incentive or rider exemption] (e.g., paperwork) for your energy efficiency project?	Yes	15	26%	42%
	No	34	60%	38%
	Don't Know	8	14%	20%

As shown in Table 5-28, most respondents said that their expectations were met or exceeded. However, a few customers stated their expectations were mostly met or not met.

Table 5-28 Decision Maker Satisfaction with Equipment Installed

	<i>Response</i>	<i>(n=57)</i>	<i>Percent of Respondents</i>	<i>Percent of Ex Post kWh Savings</i>
Did the energy efficient equipment you installed through [EDC]'s Mercantile Customer Program meet your expectations?	My expectations were exceeded	8	14%	15%
	My expectations were met	42	74%	73%
	My expectations were mostly met	3	5%	7%
	My expectations were not met	1	2%	1%
	Don't know	3	5%	4%

Participants were asked whether or not they had any issues in receiving the incentive check. Their responses are shown in Table 5-29. Twenty-one percent of respondents stated that they did encounter issues in receiving the check. Most of the problems that respondents mentioned were related to the long time it took to receive the incentive check. Other less frequently mentioned issues included, the incentive being less than expected and difficulties with the participation process such as having to provide additional information.

Table 5-29 Issues in Receiving the Incentive Check

	<i>Response</i>	<i>(n=57)</i>	<i>Percent of Respondents</i>	<i>Percent of Ex Post kWh Savings</i>
Were there any issues receiving the incentive check?	Yes	12	21%	26%
	No	37	65%	55%
	Don't Know	8	14%	19%

5.2.15 Customer Recommendations and Overall Impressions

When responding to open-ended questions regarding their experiences with the programs, participants provided some recommendations for program improvement. Several of these comments suggested that the program should be promoted better by the Companies. Other suggestions were to make the forms easier and to speed up the time that it takes to complete the process.

A number of comments offered praise for the program. Customers expressed gratitude for the program and a desire to see additional programs in the future. Some examples of these comments include:

I did not care about the process. Just glad for the process and the rebate.

Glad they offered the program.

Appreciate the program.

6. Summary and Conclusions

The interviews and surveys that were conducted provided a perspective on program operations and effectiveness during 2012. The following presents a selection of key conclusions from 2012:

- **High Program Satisfaction:** The majority of participants were very satisfied with their overall experience with the program, although some expressed dissatisfaction with the application process. Sixteen percent of participants were either dissatisfied or very dissatisfied with the effort required to apply for the incentives or with the application forms. Additionally, nearly a third of participants were somewhat or very dissatisfied with the time required to receive incentives. The Companies' program staff is aware of the dissatisfaction with the length of time required to receive the incentive. However, both the length of time to receive the incentive and the complexity of the application are partially due to the regulatory requirements for approving projects for incentives and not under the direct control of the Companies' program staff.
- **Preference for Cash Incentive over Rider Exemption:** A large share of the 2012 savings came from participants who elected to receive the cash incentive (72%) over the rider exemption (28%). Furthermore, a larger share of those who completed projects in 2012 chose the cash incentive instead of the rider exemption compared to those who completed projects in prior years. This may have occurred because projects completed in these years were motivated by the program whereas older projects were completed by customers on their own initiative. Participants motivated by the program may be more concerned with quickly recouping their costs through the incentive. Analysis of the reasons for electing the cash incentives found that most participants chose the cash incentive because they thought it offered a better rate of return than the exemption.
- **Most Savings from Older Projects:** Most of the savings achieved during 2012 came from projects completed prior to 2012. Although the generation of savings from older projects suggests that the Mercantile Customer Program's ability to generate savings in the future may diminish, similar results were found last year. Consequently, the program seems to be able to sustain savings activity from projects that were completed in prior years.
- **Manufacturing and Industrial Firms Account for Smaller Share of Savings than in 2011:** Approximately 24% of the 2012 savings accrued through the program were from manufacturing whereas approximately half of the 2011 savings came from manufacturing firms.
- **Customers Satisfied with Administrator Organizations:** In addition to promoting the program, the administrator organizations help participants file applications. Most survey respondents who worked with one of the administrator organizations were satisfied with the experience.

The following recommendations are offered to support ongoing program improvements:

- **Monitor Future Program Activity:** Although 2012 was an active year for the Mercantile Customer Program and like last year, most savings were generated from older projects, it may be more difficult for the program to generate savings over the longer term. At some point the program may work through the pool of potential participants. Program staff should continue to monitor the level of program activity with this in mind.
- **Continue ADM Review of Large Projects with Uncertain Savings:** There is a higher level of uncertainty in the estimation of ex ante savings for some measure types, such as HVAC, refrigeration, VFD, and process improvements, than for other measures, such as lighting. This uncertainty may lead to ex ante savings that are higher than ex post savings and to a correspondingly lower realization rate. For these types of measures, in cases where the savings are potentially large, it is recommended that program staff have ADM review the project and the ex ante savings estimates. This review will aid in the early identification and correction of potential overestimation of ex ante savings and help to ensure a greater realization rate for the program.

Moreover, program staff should incorporate fields into the tracking database that indicate whether or not a project was sent to the evaluator for review and the evaluators comments on the project.

Appendix A: Required Savings Tables

This appendix contains annualized gross kWh savings, first year gross kWh savings, and peak demand reductions for the Mercantile Customer Programs.

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

<i>Operating Company</i>	<i>Ex Ante kWh Savings</i>	<i>Ex Post kWh Savings</i>	<i>Realization Rate</i>
CEI	48,967,066	38,700,431	79%
OE	33,206,136	28,375,673	85%
TE	36,098,982	24,530,485	68%
Total Companies	118,272,184	91,606,590	77%

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

<i>Operating Company</i>	<i>Ex Ante Peak kW Savings</i>	<i>Ex Post Peak kW Savings</i>	<i>Realization Rate</i>
CEI	7,285.24	8,768.93	120%
OE	4,432.99	5,036.34	114%
TE	5,244.55	4,204.78	80%
Total Companies	16,962.78	18,010.04	106%

Table A-3 Summary of First Year Pro Rata kWh Savings for Mercantile Customer Program

<i>Operating Company</i>	<i>First Year Pro Rata Ex Post kWh Savings</i>
CEI	34,335,134
OE	24,660,394
TE	23,261,562
Total Companies	82,257,090

Table A-4 Summary of Lifetime kWh Savings for Mercantile Customer Program

<i>Operating Company</i>	<i>Lifetime Ex Post kWh Savings</i>
CEI	580,506,465
OE	425,635,095
TE	367,957,275
Total Companies	1,374,098,835

Appendix B: Participant Survey Instrument

FirstEnergy Ohio 2012 Mercantile Program Participant Survey

1) Did your company participate in [EDC]'s Mercantile Customer Program by implementing [Project Description]?

☐ Yes

☐ No

1a) What type of energy efficient measures did you implement under the Mercantile Customer Program (please correct as appropriate)?

Note: In the questions that follow, specific equipment will be referred to. Please answer these questions for the equipment you specify in the box below.

2) Is this energy efficient equipment still in place and operating?

☐ Yes

☐ No

2a) Why is the equipment no longer installed or operating?

3) Who was the main decision maker to implement [Project Description]?

☐ I was the main decision maker

☐ Someone else was the main decision maker

3a) What is the name, telephone number, and email address of the main decision maker?

3b) If multiple people were responsible for the decision, please provide the name of the person you think played the most important role in the decision to implement [Project Description].

After providing the information below, you may skip the remaining questions and click "submit" at the end of the survey.

4) What are the sources your organization relies on for information about energy efficient equipment, materials, and design features? (Select all that apply)

☐ [EDC] Customer Service Account Representative

☐ [EDC] website

☐ Brochures or advertisements

☐ Trade associations or business groups you belong to

☐ Trade journals or magazines

- ☐ Friends and colleagues
- ☐ An architect, engineer or energy consultant
- ☐ Equipment vendors or building contractors
- ☐ Other (please describe)

5) Which of the following policies or procedures does your organization have in place regarding energy efficiency improvements at this facility? (Select all that apply)

- ☐ An energy management plan
- ☐ Corporate policies that incorporate energy efficiency in operations and procurement
- ☐ Active training of staff
- ☐ A numeric goal for energy savings
- ☐ A numeric goal for energy cost reduction
- ☐ Other (please specify)
- ☐ None

6) How does your organization typically decide to make energy efficiency improvements for this facility? Is the decision:

- ☐ Made by one or two key people
- ☐ Based on staff recommendations to a decision maker
- ☐ Made by a group or committee
- ☐ Made in some other way
- ☐ Depends on how much the investment is
- ☐ Don't know

7) How important are incentive payments from [EDC] for your decision making regarding energy efficiency improvements?

- ☐ Very important
- ☐ Somewhat important
- ☐ Only slightly important
- ☐ Not important at all
- ☐ Don't know

8) When deciding whether to make energy efficiency improvements, how important is your past experience with energy efficient equipment?

- ☐ Very important
- ☐ Somewhat important
- ☐ Only slightly important

☐ Not important at all

☐ Don't know

9) How important is advice and/or recommendations from [EDC] for your decision making regarding energy efficiency improvements?

☐ Very important

☐ Somewhat important

☐ Only slightly important

☐ Not important at all

☐ Don't know

10) How important is advice and/or recommendations from equipment vendors for your decision making regarding energy efficiency improvements?

☐ Very important

☐ Somewhat important

☐ Only slightly important

☐ Not important at all

☐ Don't know

11) Which financial methods does your organization typically use to evaluate energy efficiency improvements for this facility? (Select all that apply)

☐ Initial Cost

☐ Simple payback

☐ Internal rate of return

☐ Life cycle cost

☐ None of these

☐ Don't know

11a) What payback length of time do you normally require in order to proceed with an energy efficiency project?

11b) What rate of return do you normally require in order to proceed with an energy efficiency project?

12) How did you learn about [EDC]'s Mercantile Customer Program? (Select all that apply)

☐ Approached directly by representative of [EDC] incentive programs

☐ Received an information brochure on [EDC] incentive programs

☐ Representative of [EDC] mentioned it

- ☐ [EDC] website
- ☐ Friends or colleagues
- ☐ An architect, engineer or energy consultant
- ☐ An equipment vendor or building contractor
- ☐ Past experience with the programs
- ☐ Other (please explain)

13) Which of the following organizations did you work with when you participated in the Mercantile Customer Program?

- ☐ Utility regional customer service
- ☐ COSE
- ☐ Industrial Energy Users – Ohio
- ☐ Ohio Manufacturer's Association
- ☐ Ohio Hospitals Association
- ☐ Ohio Schools Council
- ☐ The E-Group
- ☐ Roth Brothers
- ☐ County Commissioners' Association of Ohio
- ☐ Association of Independent Colleges & Universities
- ☐ Did not work with any of these organizations

13a) How satisfied or dissatisfied were you with your experience in working with the organization?

- ☐ Very satisfied
- ☐ Satisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Dissatisfied
- ☐ Very dissatisfied
- ☐ Don't know

13b) Why were you dissatisfied with your experience?

14) Before participating in [EDC]'s Mercantile Customer Program, had you implemented any measure similar to the [Project Description] implemented at this facility?

- ☐ Yes
- ☐ No
- ☐ Don't know

14a) What equipment was installed?

14b) Did you receive an incentive, and if so, through what program?

15) Did the [Project Description] you implemented through [EDC]'s Mercantile Customer Program meet your expectations?

☐ My expectations were exceeded

☐ My expectations were met

☐ My expectations were mostly met

☐ My expectations were not met

☐ Don't know

15a) Please explain in what ways the energy efficiency upgrades did not meet your expectations.

16) When you applied for the Mercantile Customer Program, were you aware of [EDC]'s other incentive programs (e.g., lighting programs, motor and drive programs, HVAC programs)?

☐ Yes

☐ No

☐ Don't know

16a) Why did you apply for the [incentive/rider exemption] through the Mercantile Customer Program instead of an incentive through [EDC]'s other programs?

17) Were there any issues receiving the [incentive/rider exemption]?

*

☐ Yes

☐ No

☐ Don't know

17a) Please describe the issues you had with receiving the [incentive/rider exemption].

17b) Why did you opt to receive the [incentive/rider exemption] under the program rather than the [incentive/rider exemption]?

18) How would you rate your satisfaction with the following - Very Satisfied, Somewhat Satisfied, Neither Satisfied nor Dissatisfied, Somewhat Dissatisfied, or Very Dissatisfied?

	Very Satisfied	Somewhat Satisfied	Neither Satisfied nor Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied	Don't know
Performance of the equipment installed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Savings on your monthly bill	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The [incentive/rider exemption] amount	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The effort required for the application process	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information provided by [EDC] Account Representative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The elapsed time until your application was approved	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The application forms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The application instructions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall experience with the programs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18a) Please describe in what ways you were not satisfied with the programs.

19) Did you have any issues or problems with the process required to receive the [incentive/rider exemption] (e.g., paperwork) for your energy efficiency project?

☐ Yes

☐ No

☐ Don't know

19a) Please explain what issues or problems you had with the process.

19b) How were these issues resolved?

20) Do you have any other comments that you would like to relay to [EDC] about energy efficiency in commercial and industrial facilities or about their energy efficiency programs?

21) About how many employees work for your organization?

- ☐ Less than 10
- ☐ 11 to 25
- ☐ 26 to 40
- ☐ 41 to 75
- ☐ 76 to 100
- ☐ More than 100
- ☐ Don't know

22) What is the principal activity your firm conducts at the location(s) where you installed the equipment that you received an incentive for? This may not be the main activity of your organization, but should be the main activity that occurs at the location the equipment was implemented at.*

- ☐ Office
- ☐ Retail (non-food)
- ☐ College/university
- ☐ School
- ☐ Grocery store
- ☐ Convenience store
- ☐ Restaurant
- ☐ Health care/hospital
- ☐ Hotel or motel
- ☐ Warehouse
- ☐ Personal Service
- ☐ Community Service/ Church/ Temple/Municipality
- ☐ Industrial Electronic & Machinery
- ☐ Industrial Mining, Metals, Stone, Glass, Concrete
- ☐ Industrial Petroleum, Plastic, Rubber and Chemicals
- ☐ Other Industrial
- ☐ Agricultural
- ☐ Condo Assoc/Apartment Mgmt
- ☐ Don't Know

() Other (please specify): _____

THANK YOU!

Thank you for taking this survey of [EDC] customers participating in the Mercantile Customer Program.

Your response is very important to us.

If you have any questions regarding this survey, please contact David Diebel of ADM Associates at 916-363-8383.