

Focus on Energy
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List of Acronyms

Acronym	Term
AFUE	Annual Fuel Utilization Efficiency
ARRA	American Recovery and Reinvestment Act
B/C	Benefit/Cost
BPI	Building Performance Institute
CALP	Common Area Lighting Package
CDD	Cooling Degree Days
CF	Coincidence Factor
CFL	Compact Fluorescent Lamp
CPUC	California Public Utilities Commission
CSA	Conditional Savings Analysis
CSO	Community Service Organization
CSG	Conservation Services Group
CY	Calendar Year
DHW	Domestic Hot Water
ECM	Electronically Commutated Motors
EISA	Energy Independence and Security Act of 2007
EM&V	Evaluation, Measurement, And Verification
EUL	Expected Useful Life
FAQ	Frequently Asked Questions
gpm	Gallons per Minute
HDD	Heating Degree Days
HOU	Hours of Use
HVAC	Heating, Ventilation, and air Conditioning
IECC	International Energy Conservation Code
ISR	In-Service Rate
KPI	Key performance indicator
kW	Kilowatt
kWh	Kilowatt Hour
LED	Light-Emitting Diode
LEED	Leadership in Energy and Environmental Design
LP	Liquid Propane
M&V	Measurement and Verification
MBtu/h	Thousand British Thermal Units per Hour
Me^2	Milwaukee Energy Efficiency Program
MLS	Multiple Listing Service
MMBtu	million British Thermal Units
MSB	Medium Screw Base
MW	Megawatt
MWh	Megawatt Hour

Acronym	Term
NAC	Normalized Annual Consumption
NG	Natural Gas
NOAA	National Oceanic and Atmospheric Administration
NTG	Net-to-gross
PDF	Portable Document Format
POSTNAC	Post-Installation Weather-Normalized
PRENAC	Pre-Installation Weather-Normalized
PRISM	Acronym for Modeling Software
PSC	Public Service Commission of Wisconsin
QA/QC	Quality Assurance/Quality Control
RECS	Residential Energy Consumption Survey
RFP	Request for Proposal
SEER	Seasonal Energy Efficiency Rating
SMI	State Median Income
SMP	Standard Market Practice
SPECTRUM	Statewide Program for Energy Customer Tracking, Resource Utilization, and Data Management
TMY	Typical Meteorological Year
TRC	Total Resource Cost (test)
TRM	Technical Reference Manual
UDC	Uniform Dwelling Code
UEC	Unit Energy Consumption
UMP	Uniform Methods Project

CADMUS

Residential Segment Programs

The residential segment encompasses single-family and multifamily housing. The CY 2013 evaluation reviewed ten residential segment Mass Market programs:

- Multifamily Energy Savings Program
- Multifamily Direct Install Program
- Appliance Recycling Program
- Residential Lighting and Appliance Program
- Home Performance with ENERGY STAR® Program
- Assisted Home Performance with ENERGY STAR Program
- New Homes Program
- Residential Rewards Program
- Enhanced Rewards Program
- Express Energy Efficiency Program

The CY 2013 Focus on Energy residential evaluation was designed to:

- Measure the 2013 residential segment energy and demand savings,
- Review the programs' operational and delivery processes, and
- Identify opportunities to improve the programs' efficiency and effectiveness.

Multifamily Energy Savings Program and Multifamily Direct Install Program

The Focus on Energy Multifamily Energy Savings Program and Multifamily Direct Install Program (collectively referred to as the Multifamily Programs) provide education and energy-saving opportunities to multifamily customers by offering incentives for energy-efficiency and no-cost, direct install measures. The Multifamily Programs Implementer, Franklin Energy, delivers both programs.

The Multifamily Energy Savings Program offers two types of rewards: (1) prescriptive rebates for eligible measures and (2) incentives for multitiered and performance based custom projects. The Multifamily Direct Install Program offers free direct installations of compact fluorescent lamps (CFLs), pipe insulation, faucet aerators, and showerheads inside individual living units.

The Multifamily Energy Savings Program expanded its measure offerings in CY 2013 to include the Common Area Lighting Package (CALP), which is a bundled set of lighting measures for a set price. For the Multifamily Direct Install Program, the Program Implementer initiated a pilot to test light-emitting diode (LED) bulb installation in multifamily building tenant units and also modified the internal cost structure for invoicing the Program.

Table 1 shows a combined summary of Multifamily Programs' targets and actual spending, savings, participation, and cost-effectiveness.

Table 1. Multifamily Programs Actuals Summary[1]

Item	Units	CY 2013 Actual Amount	CY 2012-2013 Actual Amount[2]
Incentive Spending	$	$1,074,797	$1,902,402
Verified Gross Life-Cycle Savings	kWh	129,299,065	221,888,438
	kW	1,222	2,791
	therms	8,128,538	16,056,080
Net Annual Savings	kWh	10,141,291	18,024,633
	kW	964	2,044
	therms	469,064	996,377
Participation	Number of Participants	577	910
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	2.59	3.23 [3]

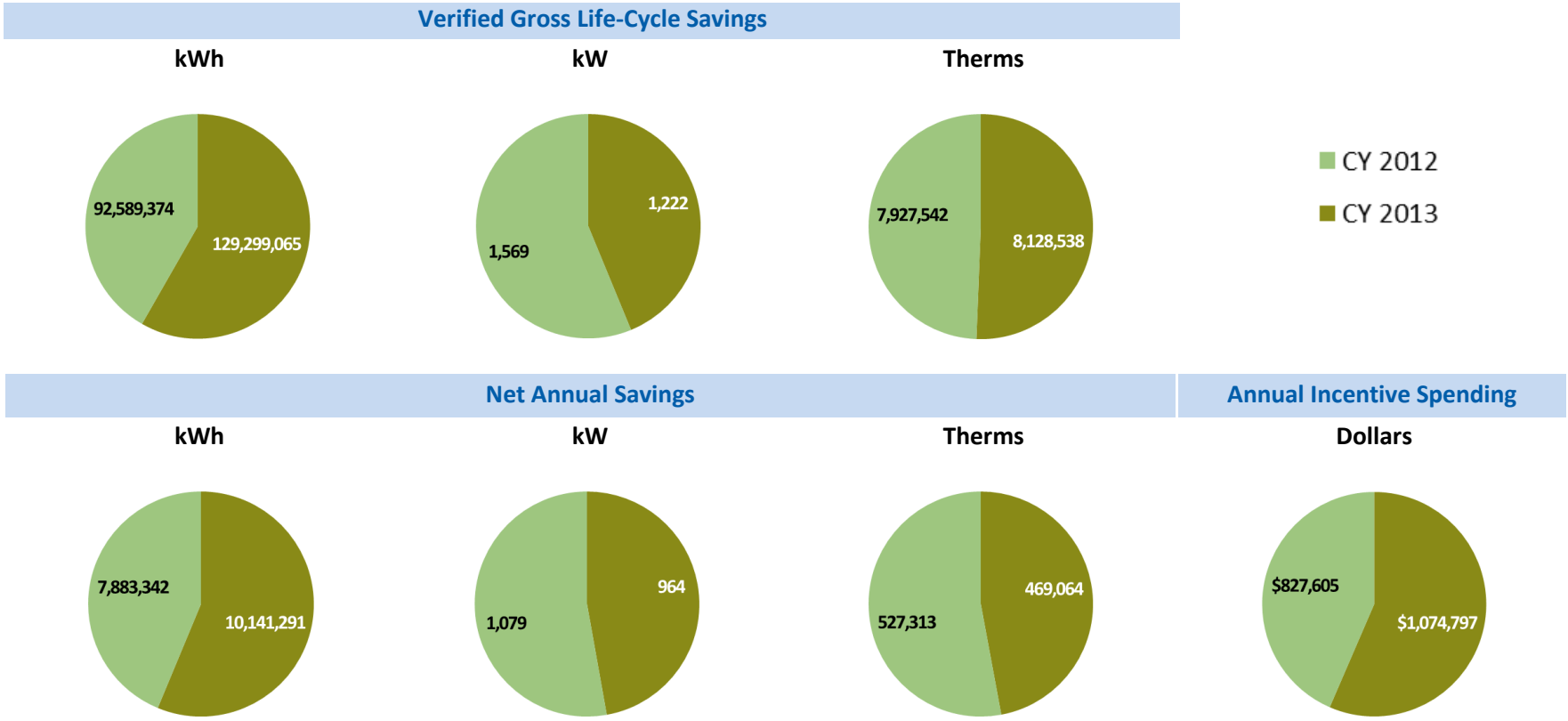
[1] This table presents gross life-cycle savings to allow comparison with Focus on Energy's quadrennial gross life-cycle savings target, and net annual savings to allow assessment of the Program Administrator and Program Implementer's achievement of net annual savings.

[2] The Program launched in 2012.

[3] The cost-effectiveness ratio is for CY 2012 only.

Figure 1 shows a summary of savings and spending progress made in CY 2012 and CY 2013.

Figure 1. Multifamily Programs Two-Year (CY 2012-2013) Savings and Spending Progress[1]



[1] The Multifamily Programs were launched in CY 2012 and no savings or costs accrued in CY 2011.

Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted impact and process evaluations for CY 2013; these were the key questions that directed the Evaluation Team's design of the evaluation, measurement, and verification (EM&V) approach:

- What are the gross and net electric and gas savings?
- How can the Multifamily Programs increase energy and demand savings?
- What are the Multifamily Programs' processes? Are key staff roles clearly defined?
- What are the barriers to increased customer participation and how effectively are the Multifamily Programs addressing those barriers? What other barriers are specific to each program?
- What is customer satisfaction with the Multifamily Programs?

The Evaluation Team designed its EM&V approach to integrate multiple perspectives in assessing the Multifamily Programs' performance. Table 2 lists the specific data collection activities and samples sizes used in the evaluations.

Table 2. Multifamily Programs CY 2013 Data Collection Activities and Sample Sizes

Activity	CY 2013 Sample Size (n)	CY 2011-2013 Sample Size (n)
Materials Review	Census	Census
Benchmarking	N/A	N/A
Participant Tenant Surveys	119	119
Program Administrator	1	3
Program Implementer	1	2
Owner/Manager Surveys[1]	50	104
Participating Contractor Interviews	0	6
Nonparticipating Contractor Interviews	0	5

[1] These surveys include 25 Multifamily Energy Savings Program participants and 25 Multifamily Direct Install Program participants.

Data Collection Activities

For the CY 2013 evaluation, the Evaluation Team conducted impact and process data collection activities.

Interviews

The Evaluation Team covered the following topic in the interviews with the Program Administrator and Program Implementer:

- Multifamily Programs' status and changes in CY 2013
- Marketing and outreach activities
- Customer and Trade Ally experience
- Program administration and data management

Surveys

The Evaluation Team conducted surveys with participating customers in two groups. The first group included building owners and managers who participated in both programs. The Evaluation Team conducted telephone surveys with these groups and questioned customers about their experiences, awareness, participation motivations, and satisfaction as well as freeridership and spillover.

The second participant survey targeted tenants who had energy-saving measures (such as CFLs and faucet aerators) installed at no cost through the Multifamily Direct Install Program. As the Program Implementer does not collect or track tenant information, the Evaluation Team designed a leave-behind survey for the tenants to mail back. Given the limited space on a mail-in survey, the survey prioritized satisfaction and freeridership.

Impact Evaluation

To calculate gross savings, the Evaluation Team reviewed the reported installations in the tracking database and applied installation rates to certain direct install measures. To calculate net savings, the Evaluation Team used participant survey data as well as the Standard Market Baseline study to determine freeridership and spillover.

Evaluation of Gross Savings

This section describes how the Evaluation Team assessed gross savings.

Tracking Database Review

The Evaluation Team reviewed the CY 2013 data contained in SPECTRUM, the Program database, for completeness and quality. SPECTRUM contained all of the data fields necessary to perform the CY 2013 evaluation activities. However, the CY 2012 evaluation's recommendations regarding improved Program tracking (such as adding fields for measure-specific information) still apply because these data are imperative to engineering reviews for impact evaluation (such as the analysis conducted for CY 2012).

Gross and Verified Savings Analysis

As described in the Multifamily Programs' Program Specific Evaluation Plan, most gross impact evaluation activities, such as engineering reviews, occurred during the CY 2012 evaluation in order to report early results for updates to claimed savings. Therefore, in addition to reviewing data for the Multifamily Programs, the Evaluation Team used deemed assumptions and algorithms in the CY 2013

evaluation to generate the measure-level savings and applied installation rates to certain direct install measures.

Realization Rates

Overall, the Multifamily Programs achieved an evaluated realization rate of 99%. Thus, the Evaluation Team concluded that the gross savings reported in SPECTRUM were mostly achieved, in accordance with the Multifamily Programs' operating criteria and previously agreed upon evaluation metrics. The Evaluation Team applied installation rates to direct install measures that are removed by the tenant for various reasons. These adjustments cause the 3% reduction in Multifamily Direct Install Program savings in Table 3, which lists the realization rate separately for the two programs.

Table 3. Multifamily Programs Realization Rates by Measure Group

Program Name	Realization Rate			
	kWh	kW	Therms	MMBtu
Multifamily Energy Savings Program	100%	100%	100%	100%
Multifamily Direct Install Program	97%	97%	97%	97%
Total	**99%**	**99%**	**99%**	**99%**

Figure 2 and Figure 3 show the realization rates by fuel type for each program.

Figure 2. Multifamily Energy Saving Program Realization Rate by Fuel Type

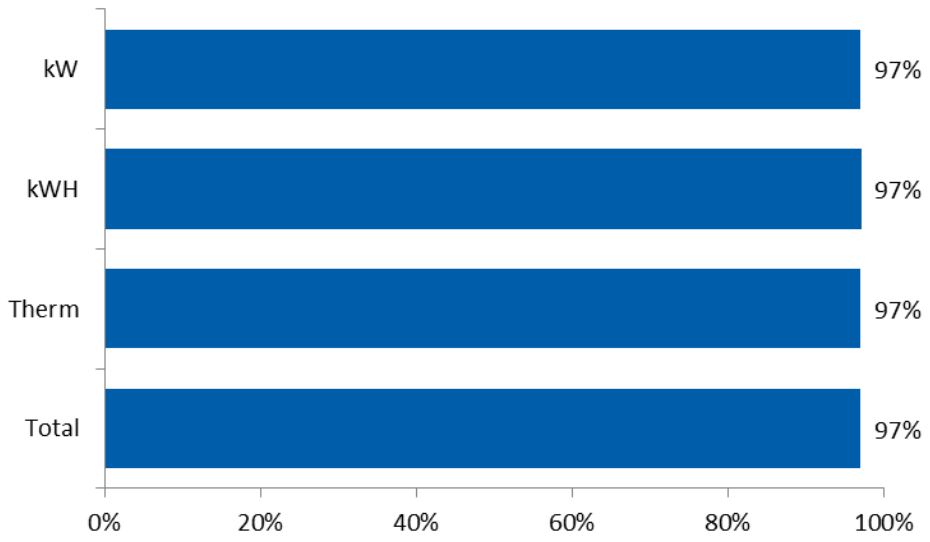
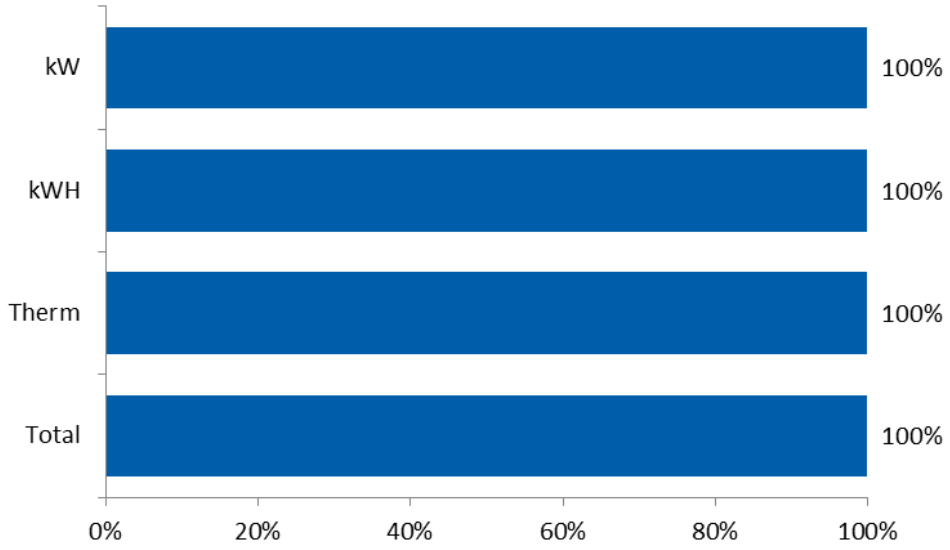


Figure 3. Multifamily Direct Install Program Realization Rate by Fuel Type



Gross and Verified Savings Results

Table 4 lists the combined *ex ante* and verified gross savings for the Multifamily Programs in CY 2013.

Table 4. Multifamily Programs Gross Savings Summary

Program	*Ex Ante* Gross			Verified Gross		
	kWh	kW	Therms	kWh	kW	Therms
Annual						
Energy Savings	8,037,638	1,008	374,445	8,037,638	1,008	374,445
Direct Install	4,190,116	220	214,182	4,066,166	214	207,637
Total Annual	**12,227,754**	**1,228**	**588,627**	**12,103,804**	**1,222**	**582,082**
Life-Cycle						
Energy Savings	96,702,944	1,008	5,854,982	96,702,944	1,008	5,854,982
Direct Install	33,563,402	220	2,344,755	32,596,121	214	2,273,556
Total Life-Cycle	**130,266,345**	**1,228**	**8,199,737**	**129,299,065**	**1,222**	**8,128,538**

Evaluation of Net Savings

This section describes how the Evaluation Team assessed net savings. The Multifamily Energy Savings Program relied on survey data and the Market Baseline Study for development of net savings. The Multifamily Direct Install Program received a stipulated net-to-gross (NTG) ratio of 1.

Net-to-Gross Analysis

The Evaluation Team assessed net savings based on two key components: freeridership and spillover.

Freeridership Findings

Freeriders are participants who would have purchased the same efficient measure at the same time without any influence from the Program. For CY 2013, the Evaluation Team used two different methodologies to assess freeridership:

- For measures included in the Market Baseline Study, or where adequate market baseline data were available from other sources, the Evaluation Team applied a standard market practice (SMP) methodology to determine freeridership.
- For measures not included in the Market Baseline Study, the Evaluation Team calculated a weighted average freeridership using self-report methodology from the participant survey.

Self-report freeridership methodologies and SMP methodologies are described in detail in Appendix L. Table 5 shows which methodology was applied for each measure group within the Program and the sample size for the measure-level analysis.

Table 5. Multifamily Energy Savings Program
Freeridership Methodology by Measure Group

Measure Group Name	Sample Size
SMP Measures	
Boiler[1]	37
CFLs	11,821
Clothes Washer	1,396
Linear Fluorescents	91,237
Faucet Aerator	29
Occupancy Sensor	616
Refrigerator	440
Water Heater	475
Self-Report Measures	
Boiler[1]	7
Boiler Tune Up	3
CFL Fixture	2
High Intensity Discharge Lighting	2
Dishwasher	1
Insulation	4
LEDs	2
LED Exist Sign	5
Misc. Lighting	2
Misc. HVAC	1
Steam Trap Repair	1
Variable Frequency Drive	1
Windows	1

[1] Net savings are derived from the SMP analysis for modulating, condensing and hybrid plant boilers, while for other boilers (such as the "Boiler, ≥ 90% AFUE, NG" measure), net savings were derived from the self-response analysis.

Overall, the Program had an average freeridership of 47% across all survey respondents and SMP analysis. The main driver contributing to this score is that the average self-report freeridership score was 38%. Another contributing factor is the SMP results for lighting (especially for one- and four- lamp linear fluorescent fixtures). These SMP results were generated from a comparison of program measures to baseline measures (data that were collected from site visits).

Spillover Findings

Spillover results when customers invest in additional efficiency measures or make additional energy-efficient behavior choices beyond those rebated through the Program. Participants reported that the Program was highly influential in their purchase and installation of energy-efficient clothes washers, furnaces, LEDs, pipe insulation, and windows (Table 6).

Table 6. Multifamily Energy Savings Program Spillover Measures

Measure Name	Quantity	Per-Unit MMBtu Savings[1]	Total MMBtu Savings[1]
Clothes Washers	72	1.11	79.64
Furnace	1	7.90	7.90
Clothes Washers	3	1.11	3.32
LEDs in Pool Area	6	1.33	8.00
Insulated Pipes in Garage	1	71.75	71.75
Windows	20	3.58	71.62
Total	**103**	**N/A**	**242.23**

[1] The Evaluation Team used MMBtu to weight the responses across participants for both electric and gas savings.

As shown in Table 7, the Evaluation Team estimated spillover at 19.4% of the Multifamily Energy Savings Program CY 2013 evaluated gross savings.

Table 7. Multifamily Energy Savings Program Spillover Estimate

Spillover MMBtu Savings	Survey Participant MMBtu Savings[1]	Percentage of Spillover
242	1,248	19.4%

[1] This value represents the CY 2013 evaluated gross energy savings.

Net-to-Gross Ratio

In order to calculate the Program net-to-gross ratio, the Evaluation Team combined the SMP, self-report freeridership, and spillover results. Table 8 shows the net-of-freeridership savings overall.

Table 8. CY 2013 Program Annual Net-of-Freeridership Savings

	Annual Net-of-Freeridership Savings (kWh)	Annual Net-of-Freeridership Savings (kW)	Annual Net-of-Freeridership Savings (Therms)	Annual Net-of-Freeridership Savings (MMBtu)
Total	**4,515,191**	**555**	**188,081**	**34,214**

Based on these results, the Program net-to-gross ratio can be calculated in two ways:

$$NTG = 1 - Freeridership\ Ratio + Spillover\ Ratio$$

or

$$NTG = \frac{Net\ Savings}{Verified\ Gross\ Savings}$$

This yielded an overall net-to-gross estimate of 72% for the Multifamily Energy Savings Program. Table 9 shows total net-of-freeridership savings, spillover savings, and total net savings in MMBtu, as well as the overall net-to-gross ratio for both Multifamily Programs.

Table 9. Multifamily Energy Savings Program Savings and Net-to-Gross Ratio

Program	Total Annual Net-of-Freeridership Savings (MMBtu)	Total Spillover Savings (MMBtu)	Total Annual Net Savings (MMBtu)	Program Net-to-Gross Ratio
Multifamily Energy Savings	34,214	12,569	46,783	72%
Multifamily Direct Install	34,637	0	34,637	100%

Net Savings Results

Table 10 shows the net energy impacts (kWh, kW, and therms) for the Multifamily Energy Savings Program combined with the Multifamily Direct Install Program. The Evaluation Team attributed these savings net of what would have occurred without the Multifamily Programs.

Table 10. Multifamily Program Net Savings

		Verified Net		
		kWh	KW	Therms
Current Program	Annual	10,141,291	964	469,064
	Life-Cycle	108,794,423	964	6,614,761

Figure 4 and Figure 5 show the net savings as a percentage of the *ex ante* gross savings by fuel type for each program.

Figure 4. Multifamily Energy Saving Program Net Savings as a Percentage of *Ex Ante* Savings by Fuel Type

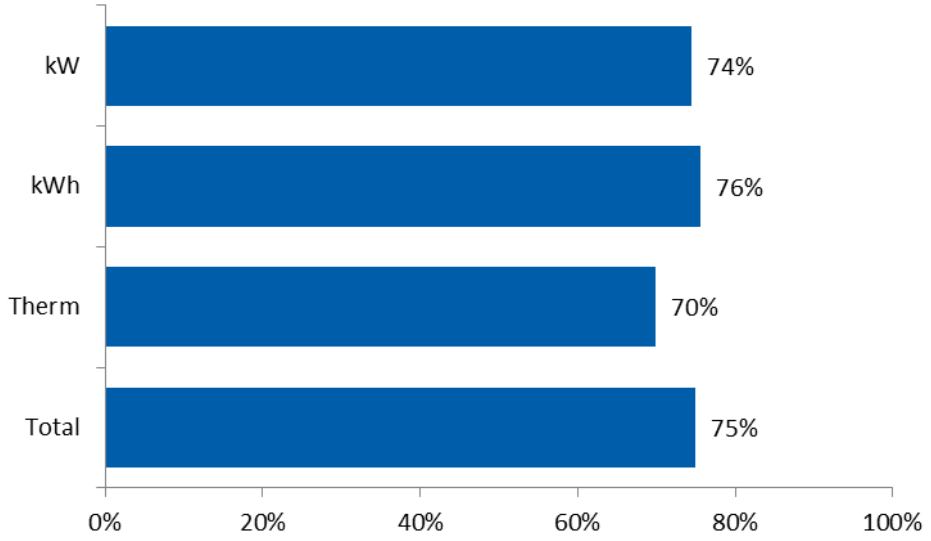
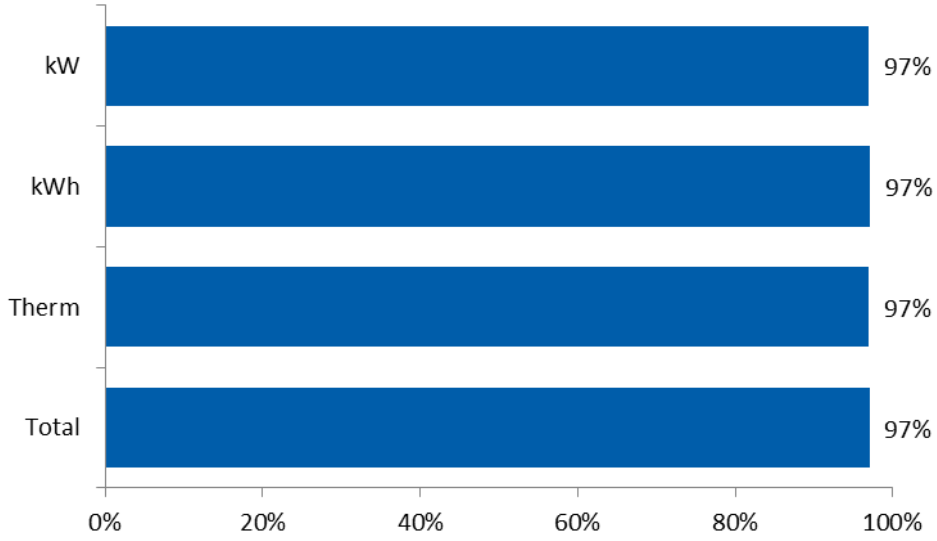


Figure 5. Multifamily Direct Install Program Net Savings as a Percentage of *Ex Ante* Savings by Fuel Type



Process Evaluation

The Evaluation Team analyzed the Multifamily Programs' performance during CY 2013 and identified opportunities for improvement. Through interviews and surveys, the Evaluation Team obtained input from the Program Administrator, the Program Implementer, participating building owners and

managers, and participating tenants. In addition, the Evaluation Team benchmarked the Multifamily Programs against similar programs across the country and performed the following activities:

- Reviewed new materials
- Assessed and evaluated each program's status and changes in CY 2013
- Examined processes, management, participation experiences, and satisfaction

The Evaluation Team also followed up on issues identified in the CY 2012 evaluation. Key recommendations from CY 2012 included:

- Modifying the per-unit payment structure for the Multifamily Direct Install Program
- Updating the operations manual to include a process flow diagram for the Multifamily Direct Install Program
- Developing Trade Ally outreach materials that would identify participation benefits to increase Trade Ally registration
- Providing an online participant application
- Electronically tracking measure-specific information

Program Design, History, and Goals

Focus on Energy launched the Multifamily Programs in April 2012, replacing the discontinued Apartment and Condo Efficiency Services Program. Focus on Energy designed the Multifamily Programs to mitigate barriers to participation and low conversion rates associated with the discontinued program. The Multifamily Programs serve similar markets and are delivered by the same Program Implementer; however, each program operates separately and has separate goals. The subsequent sections describe the design and delivery for each of the programs separately.

In an effort to compare the Multifamily Programs' offerings to the measures and incentive levels offered by other multifamily prescriptive and direct install programs, the Evaluation Team benchmarked similar programs offered throughout the country (see Table 11). The Evaluation Team used programs that were similar to the Multifamily Programs' design for either prescriptive or direct install measures. Only two of the benchmarked programs offered both prescriptive and direct install measures (similar to the Multifamily Programs).

Table 11. Benchmarked Programs

Utility	Location	Program Type
Midwestern Utility A	Michigan	Prescriptive and Direct Install
Midwestern Utility B	Illinois	Prescriptive and Direct Install
Midwestern Utility C[1]	Missouri	Direct Install
Midwestern Utility D	Iowa	Prescriptive
Midwestern Utility E	Iowa	Direct Install
Midwestern Utility F	Indiana	Direct Install
Southern Utility A	Arkansas	Direct Install
Southern Utility B	Arkansas	Direct Install
Southern Utility C	Texas	Prescriptive
Western Utility A	Washington	Prescriptive
Western Utility B	California	Prescriptive
Western Utility C	Oregon	Direct Install
Northeastern Utility A	Massachusetts	Direct Install

[1]Income-qualified program

Multifamily Energy Savings Program

The Program Administrator and the Program Implementer designed the Multifamily Energy Savings Program to offer multifamily complexes energy-efficient products and systems for both units and common areas. Customers can participate through either a prescriptive path or a custom path.

The measures for which Focus on Energy offers incentives have changed somewhat from CY 2012. In CY 2013, some custom path measures, such as parking garage exhaust controls, were moved to the prescriptive path. Additional changes for CY 2013 included new lighting measures.

The CY 2013 measure categories offered through the prescriptive path were:

- Heating, ventilation, and cooling
- Specialty measures (including vending machines and appliances)
- Water heater
- Lighting

The CY 2013 measure categories offered through the custom path were:

- Insulation
- Windows
- Temperature control systems

The prescriptive path offers set incentives for purchasing qualified energy-efficient equipment for tenant units and common areas in multifamily buildings. Nearly all Multifamily Energy Savings Program incentives remain unchanged from CY 2012. The Program Implementer did reduce the 90% Annual Fuel

Utilization Efficiency (AFUE) furnace incentive from $150 to $125. The Evaluation Team benchmarked prescriptive measure incentive amounts; Appendix M presents these findings.

The Evaluation Team also benchmarked the prescriptive measure offerings against other similar multifamily prescriptive programs. As shown in Table 12, the Multifamily Energy Savings Program has diverse offerings. The Multifamily Energy Savings Program offers the same or more prescriptive measure categories than other prescriptive multifamily programs around the country, particularly in the water heating and specialty measure categories.

Table 12. Benchmarking of Prescriptive Measure Offerings in Similar Multifamily Programs

Utility	HVAC	Building Envelope	Lighting	Water Heating	Specialty[1]
Focus on Energy	**x**	**Custom Path**	**x**	**x**	**x**
Midwestern Utility A	x	x	x	x	x
Midwestern Utility B	x	x	x		
Midwestern Utility D	x	x	x	x	x
Southern Utility C	x	x	x		x
Western Utility A	x	x	x		
Western Utility B	x		x	x	x

[1] Specialty measures include appliances, vending, pool equipment, and roofing.

The custom path offers incentives for three tiers of projects that are not included in the prescriptive path:

- Tier 1 incentives offer $0.80/therm or $0.06/kWh for projects that improve the building's energy use by up to 15%.
- Tier 2 incentives offer $1.25/therm or $0.08/kWh for projects that improve the building's energy use over 15% but less than 20%.
- Tier 3 incentives offer $1.50/therm or $0.10/kWh for projects that improve the building's energy use by more than 20%.

The custom path uses benchmarking to compare the building's energy use before and after project completion. Benchmarking is optional for Tier 1 and Tier 2 but required for Tier 3. In Tier 3 benchmarking, the customer must use a spreadsheet provided by the Program Implementer to track the building's energy use for 12 months following project completion. After six months, and again at the end of 12 months, the customer must submit the tracking spreadsheet. If the project obtained higher than projected energy savings at 12 months, the customer will receive an additional incentive equal to 50% of the original incentive amount for savings achieved above projections.

The benchmarking component was a new offering in CY 2012, but the Multifamily Energy Savings Program had no participants in the benchmarking component that year. Therefore, CY 2013 is the first year customers used the benchmarking component, and the Program Implementer does not anticipate sending out any additional incentives until CY 2014 (that is, after a full 12 months have passed following

project completion). Of the 25 participating building owners and managers surveyed, three are using the benchmarking component and expect to complete it in CY 2014.

In CY 2013, the Program Implementer added a new offering—the Common Area Lighting Package (CALP)—to the Multifamily Energy Savings Program. The CALP provides a set number of lighting measures for an upfront fixed customer cost of $179. The package includes:

- CFLs
- Occupancy sensors
- High performance T8 ballasts/lamps
- LED exit sign bulbs

Only lighting fixtures that run for more than 12 hours a day are eligible for the CALP incentive. Customers who want to install more fixtures than the CALP measure cap allows can go through the prescriptive path. Implementer staff reported they would like to add additional LED products to the CALP in future years.

Implementer staff also reported they received positive feedback from customers on the CALP. Program participation supports this statement, as there were 379 lighting measures installed through CALP in 2013. Implementer staff also said the CALP has provided Trade Allies with another avenue to drive customers to other Multifamily Energy Savings Program options, such as the prescriptive path, or to the Multifamily Direct Install Program.

Implementer staff referred Multifamily Energy Savings Program customers to Milwaukee Energy Efficiency (Me²) funding for multifamily projects throughout CY 2013.[1] The Program Implementer reported that once the Me² funding ran out, participants had no other low-interest financing options available. According to the Program Administrator, the lack of financing did not create any significant participation barriers, since the Multifamily Energy Savings Program exceeded its internal energy-savings goals for both electricity and natural gas in CY 2013 and had higher participation than anticipated.

Multifamily Direct Install Program

The Program Administrator and Program Implementer designed the Multifamily Direct Install Program to achieve energy savings by installing measures at no cost to end-users in multifamily building tenant units. The Multifamily Direct Install Program also offers free direct install of LED exit sign retrofits and pipe wrapping on up to nine feet of uninsulated hot water pipes in common areas.

[1] Milwaukee Energy Efficiency (Me²) is a federally funded program to help homeowners and business owners make energy-efficiency improvements. Please see the following link for more information: http://city.milwaukee.gov/Me2/About

Table 13 lists the Multifamily Direct Install Program measures and their installation requirements. The Program Implementer reported that it is considering adding water heater temperature turndowns in the future to achieve more savings.

Table 13. Multifamily Direct Install Program Measures and Installation Requirements

Measure	Installation Requirement
Showerhead - 1.5 gpm	Replaces showerhead flow rate ≥ 2.0 gpm
Hand-held showerhead - 1.5 gpm	Replaces showerhead flow rate ≥ 2.0 gpm
Faucet aerator - 1.5 gpm	Replaces faucet aerator flow rate ≥ 2.0 gpm
CFL - spiral (13W, 20W, 23W)	Replaces incandescent lamps
CFL - globe (14W)	Replaces incandescent lamps
CFL - candelabra base (9W)	Replaces incandescent lamps
Pipe wrap	Water heating is located in common area(s), and pipes in unconditioned space
LED exit signs	Replaces incandescent lamp or CFLs in common area exit signs

The Evaluation Team compared the Multifamily Direct Install Program's measures to those offered by similar multifamily direct install programs (see Table 14). As shown in the table, Focus on Energy's measures are consistent with those offered by other programs around the country.

Table 14. Benchmarking of Direct Install Measure Offerings in Similar Multifamily Programs

Utility	Direct Install Measure				
	Energy-Efficient Showerheads	Bathroom/ Kitchen Faucet Aerators	CFLs	Pipe Insulation	Other
Focus on Energy	**x**	**x**	**x**	**x**	
Midwestern Utility A	x	x	x	x	
Midwestern Utility B	x	x	x	x	
Midwestern Utility C	x	x	x	x	Water heater blanket Programmable thermostat Room air conditioner Refrigerator
Midwestern Utility E	x	x	x	x	
Midwestern Utility F	x	x	x		
Southern Utility B	x	x	x	x	
Southern Utility A	x	x	x	x	
Western Utility C	x	x	x		
Northeastern Utility A	x	x	x		Programmable thermostat

In CY 2013, the Program Implementer initiated a pilot to test LED bulb installation in multifamily building units and installed more than 200 9.5-watt LED lamps.

The Program Administrator changed the per-unit cost of direct install for CY 2013 because the Program Implementer ran out of money in CY 2012. In CY 2012, the Program Implementer and Program Administrator had agreed to a payment of $100 per completed unit regardless of the number of measures installed. However, the Program Implementer could not always install all direct install measures in every unit, so it ran out of money before achieving the savings goals.

To address this issue in CY 2013, the Program Implementer and Program Administrator adjusted the budget so the Implementer could offer two direct install packages: traditional and nontraditional. The traditional option involves installing three measures—CFLs, faucet aerators, and energy-efficient showerheads—that cost the Program Implementer $100 per unit. The nontraditional option involves installing at least two of these three measures, which costs the Program Implementer $60 per unit. This cost structure gave the Program Implementer more flexibility to meet the energy-savings goals within budget.

The Program Implementer surpassed the Multifamily Direct Install Program's internal participation goal of 8,000 units and also exceeded its internal therm savings targets. However, the Program Implementer reported it met only 90% of the internal electricity savings goals. The Administrator and Implementer attributed the shortfall in electricity savings to participating multifamily complex's water-heating fuel mix.

In CY 2012, most participating complexes had electric hot water, so the Program Implementer adjusted its internal CY 2013 goals to bring them more in line with the CY 2012 numbers. However, more building owners with gas water heating participated in CY 2013, so the Multifamily Direct Install Program exceeded its therm savings goals and did not achieve the higher electricity savings targets.

Program Management and Delivery

This section describes the Evaluation Team's assessment of various management and delivery aspects for both of the Multifamily Programs.

Management and Delivery Structure

The Program Implementer reported no changes to delivery in either of the Multifamily Programs in CY 2013. The Program Implementer's Energy Advisors continue to conduct site assessment and direct installs at participating complexes. Trade Allies are crucial to the Multifamily Energy Savings Program delivery, since they drive customer participation. Figure 6 and Figure 7 depict each of the Multifamily Programs' key actors and their roles.

Figure 6. Multifamily Energy Savings Program Key Program Actors and Roles

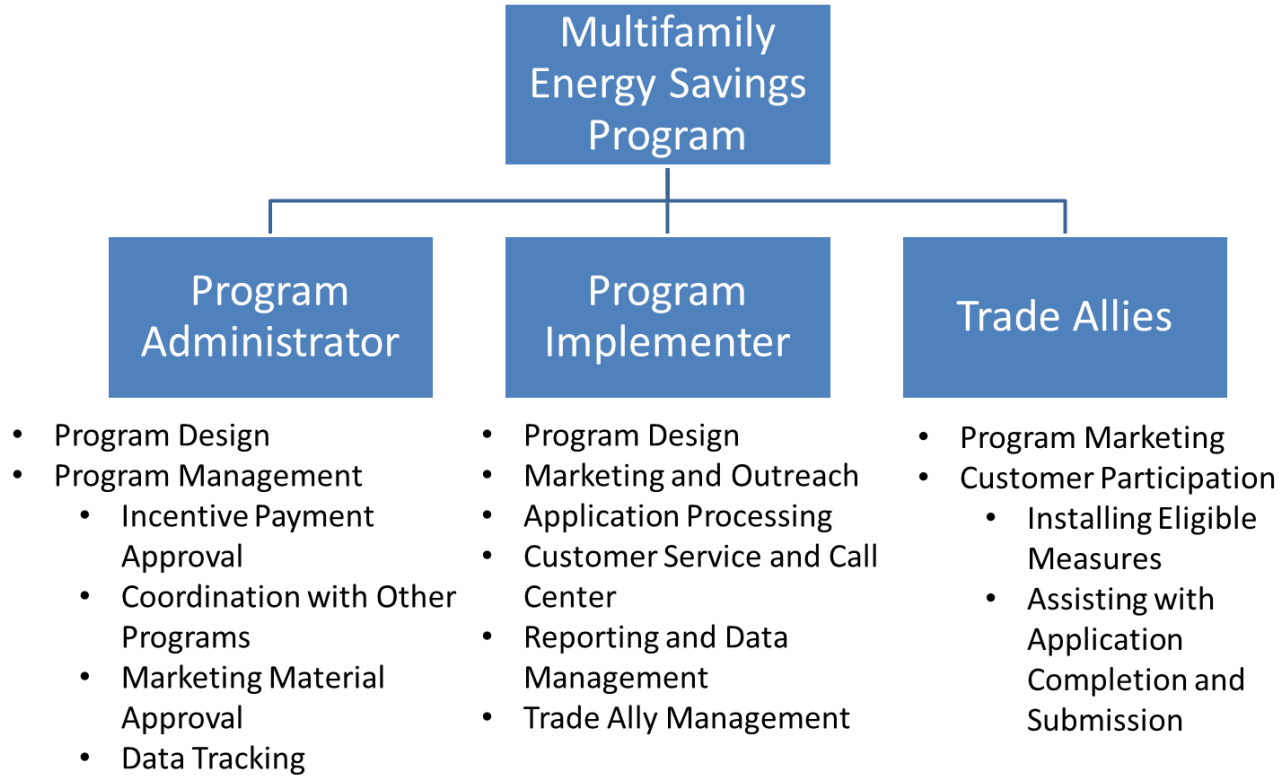
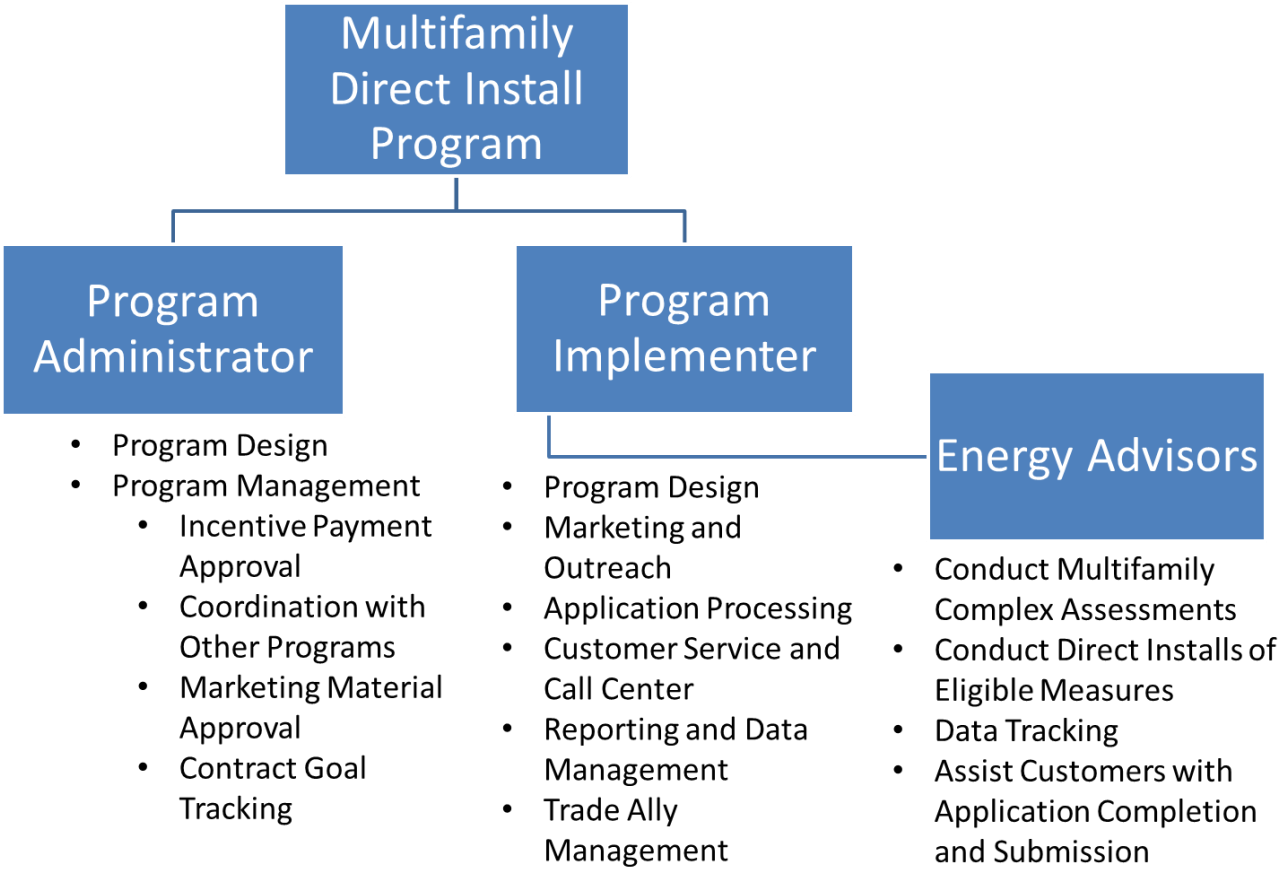


Figure 7. Multifamily Direct Install Program Key Program Actors and Roles



The Program Implementer faced two challenges delivering the Multifamily Programs in CY 2013. For the Multifamily Energy Savings Program, contractors submitted mixed-use building projects completely through the Small Business Program, rather than processing the multifamily units of the building through the Multifamily Energy Savings Program, which resulted in lost savings. For the Multifamily Direct Install Program, a high number of participants cancelled projects.

Delivery Challenges with the Multifamily Energy Savings Program

Participating Trade Allies were confused about measures eligible for mixed-use buildings. The Program Implementer reported the Multifamily Energy Savings Program lost some savings from mixed-use buildings to the Small Business Program. In a few instances, contractors who served businesses in mixed-use buildings also served the multifamily units and installed lighting or direct install measures using incentives from the Small Business Program rather than going through the Multifamily Energy Savings Program. The Program Implementer found this mistake by chance when looking through the SPECTRUM database and determined that the same mistake had occurred with at least six projects—contractors installed Small Business Program measures in properties that should have been covered under the Multifamily Energy Savings Program because the contractors did not understand the eligibility

requirements for the two programs. Additionally, the Small Business Program Implementer did not catch the eligibility mistakes through its internal application review process.

To address the problem, the Multifamily Energy Savings Program Implementer contacted the Small Business Program Implementer and the two conducted joint outreach and education activities to Small Business Trade Allies through webinars, phone calls, and mailings. The outreach reinforced each program's eligibility requirements, which the Multifamily Energy Savings Program Implementer staff said helped to address the issues. The Multifamily Energy Savings Program Implementer also launched the CALP offering to Small Business Program Trade Allies; the Implementer staff said this launch increased Small Business Trade Allies' understanding of both programs and encouraged them to work within both programs.

Delivery Challenges with the Multifamily Direct Install Program

The Multifamily Direct Install Program Experienced a High Number of Participant Cancellations. The Program Implementer experienced unexpected cancellations or loss of scheduled units that slowed its progress toward the Multifamily Direct Install Program's goals. The cancellations also impacted the cost-effectiveness of the Program, although it still met its overall goals.

Implementer staff said they were unable to access approximately 17% of the scheduled units—either they had to cancel or reschedule a whole complex or the Implementer's Energy Advisors could not access individual units to complete scheduled installations. The Program Implementer estimated that participants rescheduled 12% of those units for another day, citing reasons such as facility personnel not being able to accompany the Energy Advisors to install the measures or poor weather (e.g., snow). Implementer staff said they could not install the measures in the remaining 5% of the scheduled units for reasons such as a dog in the apartment or building maintenance staff not having access to the unit.

Typically, multifamily complexes need at least 24 hours' notice prior to the installation of measures to inform the tenants. When a complex manager or owner cancelled or requested to reschedule less than 24 hours in advance, the Program Implementer lost that scheduled time for other business; that is, the Program Implementer could not schedule another complex to fill that spot because there was insufficient time to notify tenants. To address this issue, Implementer staff began making phone calls to remind property owners or managers two days prior to the scheduled installation so they had adequate time to inform tenants and schedule maintenance staff.

Key Program Processes

The CY 2013 processes for customer participation in the Multifamily Energy Savings Program and the Multifamily Direct Install Program did not change from CY 2012.

Participating in Multifamily Energy Savings Program

To participate in Multifamily Energy Savings Program, interested building owners and managers (also known as customers) had the option of scheduling a site assessment with the Program Implementer. The customers that received the assessment then received a list of the recommended energy-efficient

upgrades available through the Multifamily Energy Savings Program's prescriptive or custom path. Custom path customers also paid a deposit and received the projected energy-savings calculations and incentive estimates. After hiring a Trade Ally or contractor to complete the prescriptive measure installation or custom project, the customer sent the incentive application and invoice to the Program Implementer. The Program Implementer then processed the application and submitted it to the Program Administrator to pay the incentive.

To participate in the new CALP offering, customers paid a $179 copay directly to a Trade Ally, who then assessed the customer site and identified eligible measures for installation. The Trade Ally then sent a preapproval form to the Program Implementer, and the Implementer verified customer eligibility and sent the Trade Ally a confirmation code via e-mail. After receiving the code, the Trade Ally completed the project and submitted the incentive application to the Implementer with the confirmation code attached. Upon receipt of the application, the Program Implementer paid the incentive for all eligible measures directly to the Trade Ally.

Participating in Multifamily Direct Install Program

Interested building owners and managers determined their eligibility for direct install measures by completing the online Eligibility Tool questionnaire. The Program Implementer verified eligibility and then scheduled an installation time for the complex. During the appointment, the Program Implementer's Energy Advisors installed the measures and left materials with tenants. After completing a direct install project, the Program Implementer invoiced the Program Administrator for reimbursement.

Program Data Management and Reporting

The Program Implementer reported no changes to its data tracking in CY 2013; it continued to use SPECTRUM for data collection and application processing. The Program Administrator reported that in CY 2014 it plans to use SPECTRUM's customer retention management component to reach prospects for both of the Multifamily Programs and to track Trade Ally outreach activity.

Multifamily Energy Savings Program Data Management and Reporting

Implementer staff entered all information from the project application and the invoice into SPECTRUM. These data include measures and quantities, incentive amounts, and customer information.

The Program Implementer conducted post-installation verification on 10% of installed projects, through either onsite verifications or surveys. Because the CALP offering was new, the Program Implementer conducted quality assurance/quality control (QA/QC) on 100% of CY 2013 CALP applications.

The Program Implementer also conducted QA/QC on participating Trade Allies' completed projects to ensure they met with equipment installation and quality standards. The Program Implementer determined what percentage of a Trade Ally's projects to verify by how long the Trade Ally had participated in the Multifamily Energy Savings Program.

Multifamily Direct Install Program Data Management and Reporting

During the installation process, Energy Advisors continued to track measure installations by hand on a worksheet, on which customers were required to sign off. Implementer staff then entered the information into SPECTRUM. The Program Implementer reported verifying 10% of unit installations through either same-day walkthroughs or post-installation customer surveys.

Implementer staff said they were required to conduct more reporting in CY 2013 than in previous years. This included both weekly and monthly status reports and additional levels of invoicing review by the Program Administrator. The increased reviewing requirements delayed the Program Implementer's savings reports to the Program Administrator by at least a week.

Marketing and Outreach

Focus on Energy rebranded in CY 2013, which affected both Multifamily Programs' marketing materials. The Program Implementer updated the applications, fact sheets, and brochures with the new branding guidelines and reformatted the online Eligibility Tool to be more interactive and user-friendly.

The Program Implementer also added several new materials in CY 2013, creating fact sheets and marketing materials for the new CALP offering and designing a window cling, which complexes could use as a badge of participation. The Evaluation Team reviewed the new materials and found them to be clear and instructive, with information on eligible measures, incentives, and Program details.

The Program Implementer made few marketing changes in CY 2013. The Program Implementer did submit separate CY 2013 marketing plans for each of the Multifamily Programs to explain Program-specific tactics, marketing campaigns, and objectives.

Multifamily Energy Savings Program Marketing and Outreach

The Multifamily Energy Savings Program marketing plan targeted outreach to customers and Trade Allies to increase their awareness and participation and to improve utility coordination. The plan outlined three major marketing campaigns to meet these objectives:

- CALP campaign
- Cooling campaign
- Early Completion Bonus campaign

The CALP campaign launched early in CY 2013 and focused on presenting the new offering to both Trade Allies and multifamily property owners and managers.

The cooling campaign promoted the prescriptive incentives for split systems and chiller units during the cooling season midyear CY 2013.

The Program Implementer launched the Early Completion Bonus campaign in the last quarter of CY 2013 to encourage Multifamily Energy Savings Program customers to complete projects before the end of the year. (The Program Implementer also conducted this campaign in CY 2012.) Customers received a higher

incentive bonus for submitting completed applications in October 2013; the extra bonus amount decreased for submissions in November and December. The Program Administrator agreed that the declining bonus structure was an effective way to encourage customers to complete their projects and was particularly effective in helping Trade Allies market to their undecided customers.

The tactics used for these campaigns and for the overall Multifamily Energy Savings Program marketing efforts included:

- Content for association newsletters, meetings, and tradeshows
- Utility reference material and web content
- Direct outreach to customers with sell sheets and e-mail blasts
- Web content and social media
- Promotion through the Multifamily Direct Install Program and Small Business Program by Energy Advisors
- E-mail blasts, webinars, and sell sheets promoted directly to Trade Allies

The Program Implementer created a Trade Ally outreach plan for the Multifamily Energy Savings Program. The plan identified specific approaches and tactics to increase Trade Ally participation through outreach to manufacturers and distributors, industry associations, and Trade Allies themselves. The Program Implementer reported that Trade Allies continued to market the Multifamily Energy Savings Program, and the Program Implementer continued to provide them with sell sheets and handouts.

The Program Implementer designed the Multifamily Direct Install Program marketing plan, which targeted multifamily property owners, managers, and tenants, to increase both customer awareness and utility coordination. Specifically, the Program Implementer focused outreach efforts on smaller complexes and university housing in CY 2013 because it had already reached much of the potential direct install market.

Throughout the year, the Program Implementer conducted outreach to customers using these tactics:

- Content for association newsletters, meetings, and tradeshows
- Utility mailings, web content, and bill inserts
- Sell sheets for Energy Advisors, which include direct install “coupons” and savings estimates
- Mailing postcards
- Web content and social media including Google Ad Words
- Sell sheets to Multifamily Energy Savings Program and Small Business Program marketing

The Program Implementer focused its university outreach on dormitories because the Focus on Energy Large Energy Users Program does not include dormitories. Implementer staff conducted installations at three universities, but they said university schedules hampered further recruitment because they could install measures in the dormitories only during the summer period when students are gone. For the

universities that the Program Implementer did not obtain the approval in time to schedule CY 2013 installations before students returned to campus to occupy dormitory rooms, the Program Implementer plans to begin the approval process again in the spring of CY 2014 in order to complete the lengthy review process before the summer break.

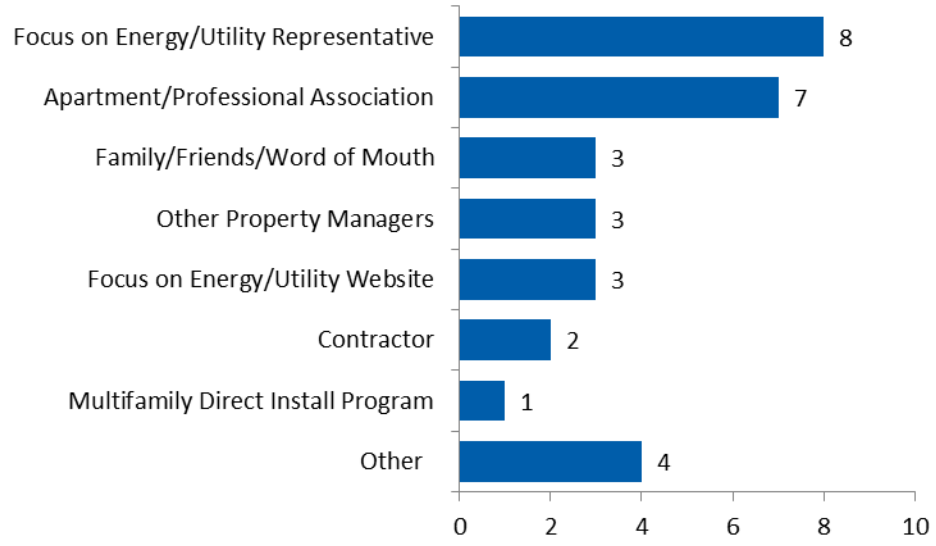
Awareness

The Evaluation Team surveyed 50 multifamily building owners and managers, 25 from each of the Multifamily Programs. In general, the Evaluation Team found that the main sources of awareness for both of the Multifamily Programs were Focus on Energy and professional networks.

When surveyed building owners and managers were asked about their main sources of information for purchasing energy-efficient products, 14 said Focus on Energy, 11 said an outside contractor, and six said Internet research. Participants also mentioned apartment or trade associations, manufacturers, and internal maintenance staff.

Most building owners and managers participating in the Multifamily Energy Savings Program said they first heard of the Program through Focus on Energy or a professional or apartment association (see Figure 8).

Figure 8. Customer Reported Source of Awareness of the Multifamily Energy Savings Program



Source: Program Building Owner/Manager Survey:
C1. "Where did you most recently hear about the Program?" (n=25; multiple responses allowed).

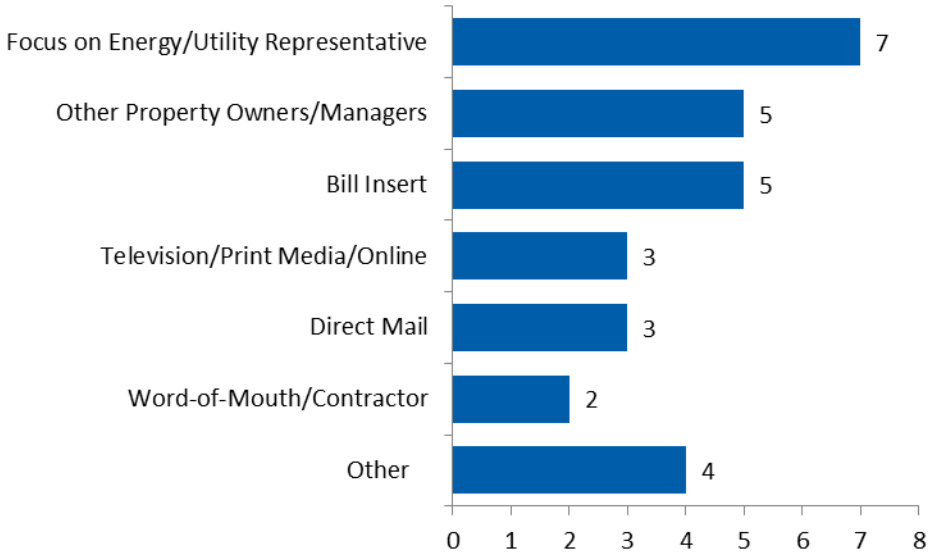
The Evaluation Team asked Multifamily Energy Savings Program participants about their awareness of and participation in the Multifamily Direct Install Program. One respondent reported learning about the Multifamily Energy Savings Program through participation in the Multifamily Direct Install Program; 19 respondents reported they were familiar with the Multifamily Direct Install Program, and six

respondents said their property had participated in the Multifamily Direct Install Program. Of the 13 who had not participated in the Multifamily Direct Install Program, only one reported not participating because he did not know about it.

When surveyed building owners and managers who participated in the Multifamily Direct Install Program were asked what their main source of information was for making a decision about purchasing energy-efficient products for the property, seven said their main source of information is equipment dealer/retailers, seven said Internet research, and five said Focus on Energy. Other sources of information included outside contractor consultations, internal maintenance staff, and the respondent's gas or electric utility.

Of the 25 Multifamily Direct Install Program building owners and managers surveyed, the majority first learned of the Multifamily Direct Install Program through Focus on Energy. The next most frequent responses for how respondents learned about the Multifamily Direct Install Program were other property owners/managers or through bill inserts (see Figure 9).

Figure 9. Customer Reported Source of Awareness of the Multifamily Direct Install Program



Source: Program Building Owner/Manager Survey:
C1. "Where did you most recently hear about Program?" (n=25; multiple responses allowed).

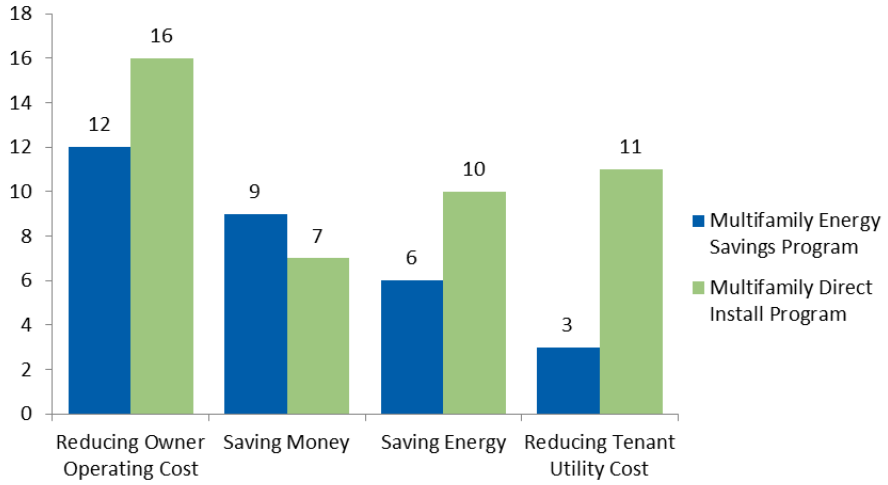
The Evaluation Team also asked Multifamily Direct Install Program participating building owners and managers about their awareness of and participation in the Multifamily Energy Savings Program. Of these 25 participants, 17 reported they were familiar with the Multifamily Energy Savings Program and three said their property had participated in it. Of the remaining respondents, only two said they did not participate in the Multifamily Energy Savings Program because they did not know about it.

Customer Experience

The Evaluation Team asked the 50 building owners and managers what motivated them to participate in one of the Multifamily Programs. Both sets of participants most frequently reported that their primary motivation to participate was to reduce operating costs for the property owner, a response similar to the CY 2012 findings.[2] Multifamily Energy Savings Program respondents also were motivated to save money. Multifamily Direct Install Program respondents also were motivated to reduce tenant utility costs and save energy.

Figure 10 shows the participants' top four motivations for participating. Participants also reported that they were motivated to participate to receive a free assessment, because it was environmentally friendly, to replace equipment to attract tenants to the property, and their corporate office directed them to participate.

Figure 10. Customer Reported Participation Motivations by Program



Source: Program Building Owner/Manager Survey and Multifamily Direct Install Program Building Owner/Manager Survey: C2. "What motivated you to participate in the program?" (n ≥ 18; multiple responses allowed).

Multifamily Energy Savings Program

Of the 25 Multifamily Energy Savings Program participating building owners and managers surveyed, 15 received the free energy assessment of their complex. Those who did not have an assessment said they had no interest in receiving one, they had previously received one, or the project was too small to receive one. All of the building owners and managers who received an assessment said they were

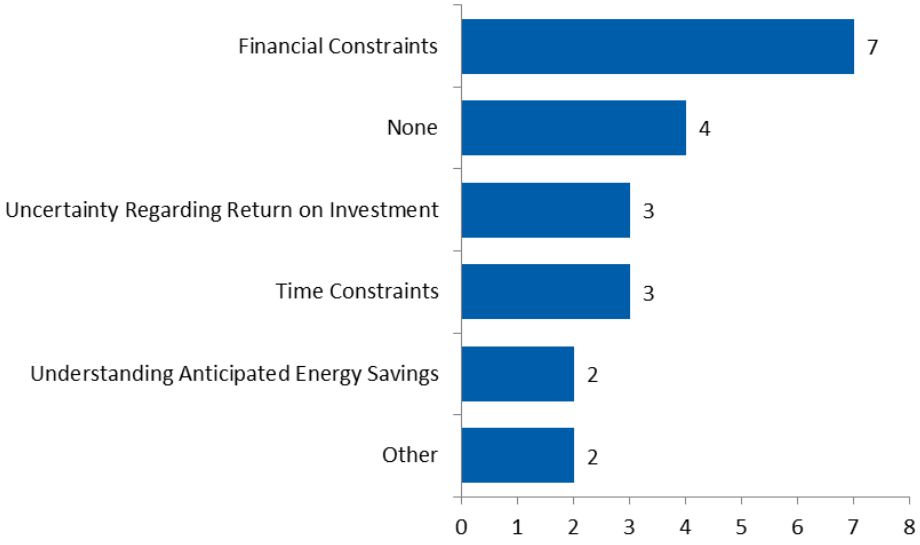
[2] The CY 2013 sample size was 140 participating building owners and managers, whereas the CY 2012 findings were anecdotal with a sample size of 10 building owners and managers.

satisfied with the quality of information provided in the results; these same respondents also reported satisfaction with the professionalism of the Energy Advisor who completed the assessment.

The majority of the 25 building owners and managers reported they did not encounter problems or challenges when deciding to participate in the Multifamily Energy Savings Program. Of the seven who encountered problems, five reported that the qualification process was lengthy and the paperwork was complex.

When asked to identify barriers to implementing multiple energy-efficiency projects through the Multifamily Energy Savings Program; respondents most frequently reported financial constraints as the primary barrier (see Figure 11).

Figure 11. Customer Barriers to Implementing Measures through the Multifamily Energy Savings Program



Source: Program Building Owner/Manager Survey: D10. "What are the barriers to implementing multiple energy-efficiency projects through the Multifamily Energy Savings Program?" (n=23).

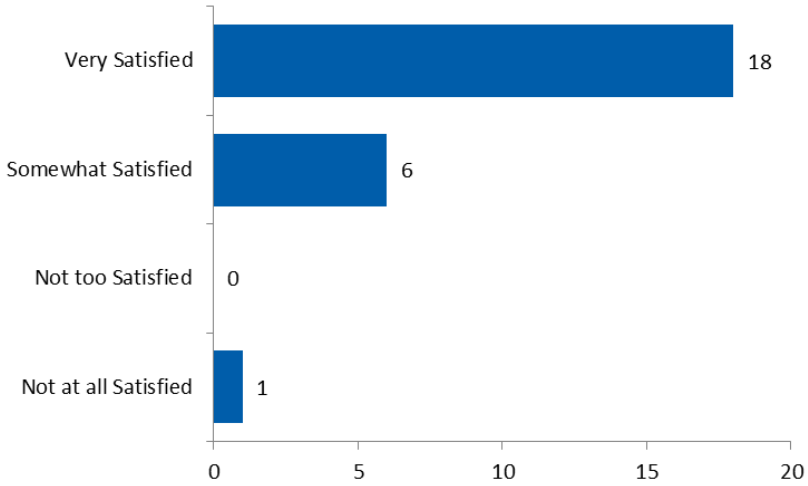
The Evaluation Team asked the three Multifamily Energy Savings Program participants who reported they were uncertain about the return on investment what payback period they would prefer for their projects. One respondent preferred a two-year payback, and the other two said they preferred the payback to be five years or less.

The majority of surveyed building owners or managers were satisfied with their Multifamily Energy Savings Program experience, as shown in Figure 12.

The building owner/manager who reported being "not at all satisfied" said it was difficult to complete the project because he did not fully understand the qualifications and he had difficulty communicating with the Focus on Energy representatives.

Twenty-four of the 25 surveyed participating building owners and managers said they were likely to recommend the Multifamily Energy Savings Program to other multifamily properties. When asked how the Multifamily Energy Savings Program could be improved, respondents suggested extending the variety of measures covered by the Program (such as adding insulation), increasing incentive amounts, and simplifying the application process.

Figure 12. Customer Satisfaction with the Multifamily Energy Savings Program



Source: Program Building Owner/Manager Survey: H1. "How satisfied have you been with the Multifamily Energy Savings Program as a whole?" (n=25)

Multifamily Direct Install Program

Of the 25 Multifamily Direct Install Program participants, only four reported encountering participation barriers. These barriers included tenants not wanting to switch to the new products or problems with the measures, such as bulbs burning out or faucets not accommodating the aerators.

Five respondents reported having to repair or prematurely replace equipment they received through the Multifamily Direct Install Program. Three respondents needed to replace CFLs and two needed to replace kitchen faucet aerators. When asked how satisfied they were with each of the direct install measures, more than 90% of the 25 participants reported satisfaction with each measure.

In addition, the Evaluation Team found that, compared to other multifamily direct install programs, Focus on Energy's Program had some of the country's highest satisfaction levels with direct install measures (see Table 15). These favorable satisfaction results indicate measure failure is not a pervasive issue within the Multifamily Direct Install Program. Continued monitoring of measure performance will identify any performance issues in future years.

Table 15. Benchmarking of Percentage of Building Owners/Managers Satisfied with Direct Install Measures

Utility	Direct Install Measure Satisfaction		
	Energy-Efficient Showerheads	Bathroom/Kitchen Faucet Aerators	CFLs
Focus on Energy	**100%**	**95%**	**92%**
Midwestern Utility A	87%	91%/85%	82%
Midwestern Utility F	96%	96%	96%
Southern Utility A	66%	63%	88%

Seventeen (the majority) of building owners and managers reported receiving informal feedback from their tenants about the new equipment installed in the units. Of these 17 participants, six reported they received only positive feedback, stating the tenants were happy with the new measures. Eleven participants reported they received mixed or negative feedback, primarily about the water pressure from the showerheads and dimness of the CFLs. Five respondents reported they heard of tenants removing equipment in the unit, usually a showerhead or CFL.[3]

The Evaluation Team also asked 87 tenants in participating complexes to rate their satisfaction with the direct install measures they received though the Multifamily Direct Install Program. Over 90% of the surveyed tenants reported high satisfaction with all of the installed measures. The Evaluation Team benchmarked tenant satisfaction with direct install measures to other multifamily direct install programs around the country and found that Focus on Energy has some of the highest satisfaction rates for the direct install measures, as rated by tenants (see Table 16).

Table 16. Benchmarking of Percentage of Tenants Reporting Satisfaction with Direct Install measures

Utility	Tenant Satisfaction with Direct Install Measures		
	Energy-Efficient Showerheads	Bathroom/Kitchen Faucet Aerators	CFLs
Focus on Energy	96%	92%	96%
Midwestern Utility A	73%	73%	72%
Midwestern Utility C	94%	73%	84%
Northeastern Utility A	83%	76%	81%
Southern Utility B	92%	99%	86%

Of the 45 tenants who provided feedback, the majority gave positive feedback about the products and experience, stating the Energy Advisors were efficient, polite, and clean. Comments included:

- "Love the efficient upgrades."
- "Your men were in and out—most efficient I have ever seen."

[3] This is an anecdotal finding, and the Evaluation Team did not apply this finding to its impact evaluation.

- "It is working really good for us!"
- "Lights make just a big difference."
- "Excellent: The providers were helpful and efficient and friendly."

Of the eight respondents who had complaints, four said they were not pleased with the length of time it took for the CFLs to brighten, and one respondent did not like the change in water pressure with the water-saving measures. Of the remaining four respondents, two said the showerhead was not directed properly or was leaking, one said that the old bulbs were left in the unit, and one reported that her unit door was left unlocked.

When asked about their satisfaction with the Multifamily Direct Install Program, 22 of the building owners or managers reported being "very satisfied," and three said they were "somewhat satisfied." All 25 respondents reported they were "very likely" to recommend the Multifamily Direct Install Program to other multifamily complexes. Most of the respondents did not have suggestions for improving the Multifamily Direct Install Program. The few respondents who did provide recommendations suggested giving customers more information, leaving spare measures behind, removing bulb limits in units, and customizing measures for senior apartments.

Trade Ally Experience

The Evaluation Team did not conduct Trade Ally surveys for the CY 2013 evaluation. However, the Program Implementer reported that the number of registered Trade Allies in the Multifamily Energy Savings Program significantly increased from 760 in CY 2012 to 2,222 in CY 2013, and the Program Administrator reported that Trade Allies delivered substantial savings to the Multifamily Energy Savings Program in CY 2013.[4] The Program Administrator also reported that Trade Ally registration was simpler in CY 2013, as contractors were able to submit their Trade Ally registration online.

The Program Implementer also said the Multifamily Energy Savings Program needs more Trade Allies for the CALP offering. The Program Implementer offered several CALP trainings to Trade Allies, but it reported that some Trade Allies did not think the CALP incentives were high enough to cover their costs so they did not want to participate. These comments prompted the Program Implementer to consider increasing CALP measure incentives in future years.

Program Cost-Effectiveness

Evaluators commonly use cost-effectiveness tests to compare the benefits and costs of a demand-side management program. The benefit/cost (B/C) test used in Wisconsin is a modified version of the total resource cost (TRC) test. Appendix I includes a description of the TRC test.

Table 17 lists the CY 2011-2013 incentive costs for the Multifamily Programs.

[4] According to the Program Administrator, Trade Allies delivered roughly 70% of Program savings; however, the Evaluation Team did not have sufficient data to corroborate this report.

Table 17. Multifamily Program Incentive Costs

	CY 2013	CY 2011-2013
Incentive Costs	$1,074,797	$1,902,402

The Evaluation Team found the CY 2013 Programs to be cost-effective (a TRC benefit/cost ratio above 1). Table 18 lists the evaluated costs and benefits.

Table 18. Multifamily Program Costs and Benefits

Cost and Benefit Category	CY 2013	CY 2012
Costs		
Administration Costs	$413,728	$442,748
Delivery Costs	$943,484	$1,009,662
Incremental Measure Costs	$5,480,760	$2,001,240
Total Non-Incentive Costs	$6,831,520	$3,453,650
Benefits		
Electric Benefits	$7,345,973	$3,627,972
Gas Benefits	$6,318,128	$5,136,035
Emissions Benefits	$3,996,184	$2,379,194
Total TRC Benefits	$17,660,285	$11,143,200
Net TRC Benefits	**$10,828,765**	**$7,689,550**
TRC B/C Ratio	**2.59**	**3.23**

Evaluation Outcomes and Recommendations

Both Multifamily Programs had a positive year in CY 2013. The Multifamily Energy Savings Program exceeded its energy-savings goals and experienced an increase in Trade Ally participation that contributed to savings. Participating building owners and managers expressed satisfaction with the Multifamily Energy Savings Program, which expanded to include the new CALP offering in CY 2013. Most of the surveyed participants learned about the Multifamily Energy Savings Program through Focus on Energy.

The Multifamily Direct Install Program exceeded participation and natural gas savings goals, and it came within 10% of achieving its electricity goals. Building owners and managers reported that they participated in the Multifamily Direct Install Program to reduce owner and tenant costs, and all of the surveyed participants reported satisfaction with the Multifamily Direct Install Program. The Multifamily Direct Install Program addressed market saturation barriers by targeting university housing and smaller, rural multifamily complexes. Building owners, managers, and tenants reported high satisfaction with direct install measures.

The Evaluation Team identified the following outcomes and recommendations to improve both offerings.

Outcome 1. Participants reported high satisfaction with both Programs, particularly for direct install measures.

All but one of the 50 building owners and managers surveyed were satisfied with their participation in their selected program. In addition, the majority of direct install participants and tenants reported high satisfaction with the measures. Focus on Energy participants, both building owners and manager and tenants, reported generally higher satisfaction with the Multifamily Direct Install Program's direct install measures than participants in similar multifamily direct install programs across the country.

Outcome 2. Reduced financing resources for multifamily building owners and managers could impact Multifamily Energy Savings Program participation in future years.

Financing programs such as *Me*^{2} and GreenMadison ran out of grant funding in CY 2013. According to the Program Implementer, there were no other financing options for the Multifamily Energy Savings Program customers. While the Program Administrator did not view lack of financing as a significant barrier to CY 2013 participation as the Multifamily Energy Savings Program did meet its goals, surveyed customers said financial constraints were the main reason they did not install multiple recommended projects.

Recommendation 2. Research the potential for collaboration with financing organizations. With grant funding ending, there is a hole in the market for funding options. Therefore, Focus on Energy should consider researching potential partnerships with organizations that provide funding for energy-efficiency projects.

Outcome 3. Both of the Multifamily Programs met their overall energy goals, overcoming implementation barriers.

The Program Implementer faced several barriers specific to the multifamily market in CY 2013, including a saturated market and appointment cancellations, which the Program Implementer was able to address. The Implementer also faced Trade Ally misunderstandings about the Small Business Program. Though Implementer staff successfully conducted extensive outreach to contractors and to the Small Business Program Implementer, if a contractor completes a project in a mixed-use building, the customer must submit two applications for the two parts of the building.

Recommendation 3. Review the feasibility of a joint application between the Small Business Program and the Multifamily Energy Savings Program. In addition to its educational outreach effort about Program requirements, the Multifamily Energy Savings Program has recruited Small Business Program Trade Allies to market the Program. This is an effort to make sure mixed-use buildings are receiving incentives through the correct program and that each program both accounts for its savings accurately and captures savings in these buildings. However, when considering the customer perspective, encouraging energy-efficiency projects in mixed-use buildings requires participants to complete and mail in two separate applications and receive two separate incentive payments, which may be a barrier for customers to implement such projects. In an effort to reduce the customer burden and simplify the process, Focus on Energy should review the feasibility of offering a joint application.

Outcome 4. Customers continue to report challenges with application paperwork.

Customers in CY 2013, as in CY 2012, reported difficulties with understanding some of the requirements for participation in the Multifamily Energy Savings Program and completing the application paperwork.

Recommendation 4. Continue with plans to simplify applications in CY 2014. As noted in the CY 2012 evaluation, simplifying applications will ease the process for customers and Trade Allies. It may also reduce data transcription errors, ensure participants complete the submitted applications, and provide another outreach avenue to notify customers of offerings like benchmarking.

Appliance Recycling Program

The Appliance Recycling Program was launched in March 2012 to expedite the retirement of old, inefficient appliances to reduce peak demand and increase annual energy savings. JACO Environmental is the Program Implementer. The Program made no major changes in CY 2013.

Table 19 provides a summary of actual spending, savings, participation and cost-effectiveness.

Table 19. Appliance Recycling Program Actuals Summary[1]

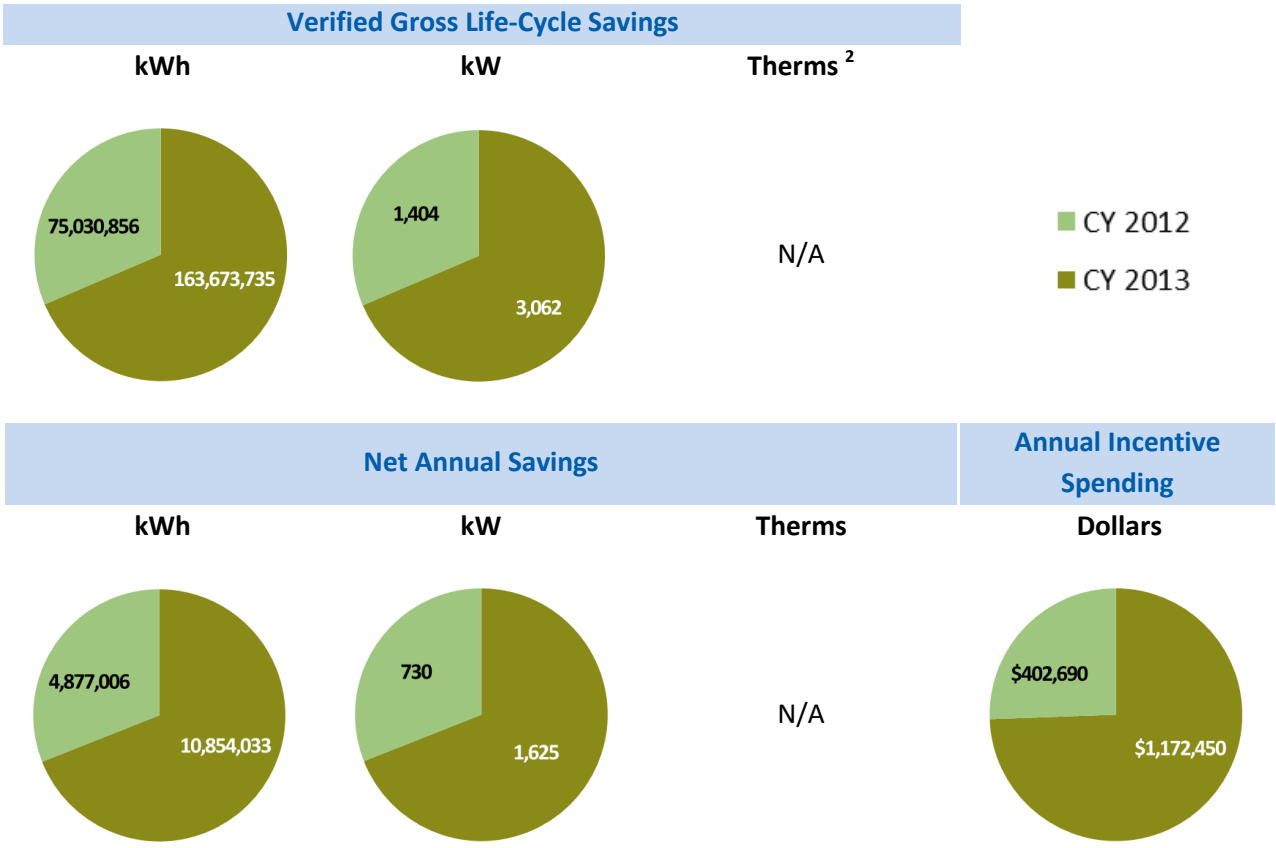
Item	Units	CY 2013 Actual Amount	CY 2012-13 Actual Amount
Incentive Spending	$	$1,172,450	$1,575,140
Verified Gross Life-Cycle Savings	kWh	163,673,735	238,704,591
	kW	3,062	4,466
Net Annual Savings	kWh	10,854,033	15,731,039
	kW	1,625	2,355
Participation	Refrigerators	18,032	27,731
	Freezers	5,395	9,119
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	2.99	1.63 [2]

[1] This table presents gross life-cycle savings to allow comparison with Focus on Energy's quadrennial gross life-cycle savings target, and net annual savings to allow assessment of the Program Administrator and Program Implementer's achievement of net annual savings.

[2] The cost-effectiveness ratio is for CY 2012 only.

Figure 13 provides a summary of savings and spending progress made in 2012 and 2013.

Figure 13. Appliance Recycling Program Two-Year (2012-2013) Savings and Spending[1]



[1] The Appliance Recycling Program Launched in January, 2012.

[2] The Program does not provide natural gas savings.

Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted impact and process evaluations for the CY 2013 Appliance Recycling Program. These were the key questions that directed the Evaluation Team's design of the measurement and verification (EM&V) approach:

- What are the gross and net electric savings?
- How can the Program increase its energy and demand savings?
- What is the Program process? Are key staff roles clearly defined?
- What are the barriers to increased customer participation and how effectively is the Program overcoming those barriers? What are other barriers specific to this Program?
- What is customer satisfaction with the Program?

The Evaluation Team designed its EM&V approach to integrate multiple perspectives in assessing Program performance. Table 20 lists the specific data collection activities and sample sizes (where applicable) used to evaluate the Program.

Table 20. Appliance Recycling Program CY 2013 Data Collection Activities and Sample Sizes[1]

Activity	CY 2013 Sample Size (n)	CY 2011-2013 Sample Size (n)
Impact		
Program Database Review	Census (23,427)	Census (36,850)
Engineering Review and Deemed Savings Algorithms	Census	Census
Multivariate Regression Model Supported by Metering Site Visits	N/A	28
Participant Surveys	131	193
Process		
Materials Review	N/A	Census
Stakeholder Interviews[2]	2	4

[1] The Evaluation Team combined the Wisconsin metering data collected through the CY 2012 evaluation with meter data collected for recent evaluations in Michigan. The combined metering dataset consisted of 215 refrigerators and 64 freezers.

[2] Stakeholders interviewed included the Program Administrator's Program Manager and the Program Implementer's Program Manager.

Data Collection Activities

The Evaluation Team conducted the impact evaluation using the Implementer's tracking data and a survey of 131 participants. The survey was stratified by appliance type: 70 participants who recycled refrigerators and 61 who recycled freezers. Participant surveys support both gross—for primary/secondary usage, location of the unit in the home prior to recycling, and part use—and net savings estimation.

For the process analysis, the Evaluation Team interviewed Program Administrator staff and Program Implementer staff. The interview findings were combined with the participant survey responses to inform the process analysis.

Impact Evaluation

To calculate gross savings, the Evaluation Team reviewed the Program tracking data provided by the implementer then combined these data with results from the participant surveys. To calculate net savings, the Evaluation Team used participant survey data to determine freeridership and spillover.

Evaluation of Gross Savings

This section describes how the Evaluation Team assessed gross Program savings.

Tracking Database Review

The Evaluation Team reviewed the CY 2013 data contained in SPECTRUM, the Program database, for completeness and quality.

Because SPECTRUM does not contain many of the appliance characteristics—most importantly, size, age, and configuration of Program units—that are necessary for estimating gross savings, the Evaluation Team also requested the Implementer tracking database for CY 2013. This database contained many of the necessary data fields. Examples of these fields are:

- Appliance tracking number
- Customer data
- Date of scheduling and appliance pick-up
- Manufacturer, brand, and model number
- Configuration, size, and age of unit
- Whether or not the unit was replaced
- Type of refrigerant

The Evaluation Team then compared a census of records in SPECTRUM with the Implementer tracking data to ensure appliance quantities matched. The Evaluation Team found a couple of issues.

First, when conducting the CY 2012 evaluation, SPECTRUM was undergoing some changes and did not contain the complete records for the entire Program year. Because of this the Evaluation Team relied on the Implementer tracking data for the verified unit counts in CY 2012. Some of the units in the Implementer records were picked up at the end of CY 2012, but the payments were not processed until CY 2013 and those records were found in the CY 2013 SPECTRUM records. The Evaluation Team removed these records since they had already been counted in CY 2012.

There were also four records that were duplicated in SPECTRUM. The Implementer indicated there was an issue with the upload of the records and the orders were submitted twice. The duplicated records were removed.

Finally, SPECTRUM had a number of records that did not match to the Implementer tracking data. The "ApplicationName" field in SPECTRUM appeared to be incorrect. However, when following up with the Implementer, the Evaluation Team discovered that records from January were not uploaded to SPECTRUM due to some changes made at the beginning of CY 2013. The number of records that did not get properly uploaded from the Implementer was slightly higher than the number of records in SPECTRUM that had incorrect "ApplicationName" numbers. Therefore, the Evaluation Team made no adjustments to the counts based on these discrepancies.

Gross and Verified Gross Savings Analysis

Multivariate Regression Model

To estimate consumption for refrigerators, the Evaluation Team used the same regression model specified in the CY 2012 evaluation; this model complied with the Uniform Methods Project (UMP).[5] Since UMP does not provide a model for freezers, a separate, analogous model was developed to estimate its unit energy consumption (UEC).

The Evaluation Team combined the metering data collected through the CY 2012 evaluation (20 refrigerators and eight freezers) with meter data collected for recent evaluations in Michigan between 2010 and 2012 in order to develop a multivariate regression model that estimated the average UEC of retired refrigerators and freezers. The combined metering dataset consisted of 215 refrigerators and 64 freezers.

Table 21 shows the model and its estimated parameters that the Evaluation Team used to estimate a refrigerator's annual UEC. Cooling degree days (CDDs) and heating degree days (HDDs) are the weighted average values from typical meteorological year 3 (TMY3) data for weather stations mapped to participating appliance ZIP Codes.[6]

[5] U.S. Department of Energy. "Uniform Methods Project for Determining Energy Efficiency Program Savings for Specific Measures Chapter 7: Refrigerator Recycling Evaluation Protocol." Accessed March 13, 2014. http://www1.eere.energy.gov/wip/pdfs/53827-7.pdf

[6] TMY3 is a typical meteorological year that uses median daily values for a variety of weather data collected from 1991–2005.

Table 21. Refrigerator UEC Regression Model Estimates
(Dependent Variable = Average Daily kWh, R-squared = 0.341)

Independent Variables	Coefficient	Standard Error	p-Value[1]
Intercept	1.36	0.90	0.13
Age (years)	0.03	0.04	0.44
Dummy: Unit Manufactured Pre-1990s[2]	0.61	0.41	0.14
Size (cubic feet)	0.02	0.06	0.71
Dummy: Single Door	-2.31	0.64	0.00
Dummy: Side-by-Side	1.88	0.66	0.01
Dummy: Primary	0.32	0.63	0.62
Interaction: Unconditioned Space x HDDs	-0.01	0.03	0.85
Interaction: Unconditioned Space x CDDs	0.03	0.04	0.35

[1] A p-value indicates the probability that a statistical finding might be due to chance. A p-value less than 0.10 indicates that, with 90% confidence, the finding is statistically significant.

[2] Though age and pre-1990 variables do overlap, the Evaluation Team tested for multicollinearity using variance inflation statistics (VIF) in the regression model. The VIFs did not indicate severe multicollinearity. Because of the large impact on consumption observed with the introduction of the appliance efficiency standards in 1990, it is appropriate that the model include both variables.

Table 22 lists the final model specifications the Evaluation Team used to estimate the energy consumption of participating freezers. As noted above, because UMP only specifies a refrigerator model, the Evaluation Team created an analogous freezer model.

Table 22. Freezer UEC Regression Model Estimates
(Dependent Variable = Average Daily kWh, R^2 = 0.382)

Independent Variables	Coefficient	Standard Error	p-Value
Intercept	-0.95	0.80	0.24
Age (years)	0.05	0.01	0.00
Dummy: Unit Manufactured Pre-1990	0.54	0.33	0.11
Size (cubic feet)	0.12	0.04	0.00
Dummy: Chest Freezer	0.30	0.28	0.29
Interaction: Unconditioned Space x HDDs	-0.03	0.01	<.0001
Interaction: Unconditioned Space x CDDs	0.08	0.04	0.03

Table 23 lists the Program averages or proportions for each independent variable (as reported by Program Implementer in the CY 2013 Program database).

Table 23. CY 2013 Participant Mean Explanatory Variables

Appliance	Independent Variables	Participant Population Mean Value
Refrigerator	Age (years)	26.52
	Dummy: Manufactured Pre-1990	0.52
	Size (cu. ft.)	17.25
	Dummy: Single Door	0.12
	Dummy: Side-by-Side	0.14
	Dummy: Primary	0.51
	Interaction: Unconditioned Space x HDDs	3.89
	Interaction: Unconditioned Space x CDDs	0.28
Freezer	Age (years)	31.36
	Dummy: Manufactured Pre-1990	0.74
	Size (cu. ft.)	15.84
	Dummy: Chest Freezer	0.46
	Interaction: Unconditioned Space x HDDs	5.18
	Interaction: Unconditioned Space x CDDs	0.37

Using the values from Table 21, Table 22, and Table 23, the Evaluation Team estimated the *ex post* annual UEC of the average refrigerator and freezer participating in the Program. Table 24 displays estimated *ex post* estimates compared to the Program's initial *ex ante* values.

Table 24. Average UEC by Appliance Type

Appliance	*Ex Post* Annual UEC (kWh/year)	Relative Precision (90% Confidence)
Refrigerators	1,081	17%
Freezers	1,215	18%

Part Use

A part-use factor is an adjustment to gross energy-savings specific to appliance recycling programs. It is applied to annual gross savings, to account for participating refrigerators that were not operating year-round before being recycled.

The participant survey included a question about how appliances would have been operated had they not been recycled.

How the unit was actually used before being recycled is not necessarily how it *would have been* used had it not been recycled. For example, it is possible that a primary refrigerator operated year-round would have become a secondary appliance that was operated part-time. This methodology accounts for these potential changes in usage.

Part-use is calculated using a weighted average of the following part-use categories and factors:

- Appliances that would have run full-time (part-use = 1.0)
- Appliances that would not have run at all (part-use = 0.0)
- Appliances that would have operated a portion of the year (part-use is between 0.0 and 1.0)

Using information gathered through the participant survey, the Evaluation Team employed the following multistep process to determine part-use, as described in the UMP protocol.

1. Determine if the recycled refrigerators were primary or secondary units. All stand-alone freezers were assumed secondary units.
2. Ask those participants who said they had recycled a secondary refrigerator if the refrigerator was unplugged, operated year-round, or operated for a portion of the preceding year. All primary units were assumed to operate year-round. (Participants who recycled freezers were asked the same question.)
3. Ask participants who said they recycled a secondary refrigerator or freezer (or a unit that was operated for only a portion of the preceding year) for an estimate of the total number of months that the appliance was plugged in.
4. Divide each value by 12 to calculate the annual part-use factor for all secondary refrigerators and freezers operated for only a portion of the year.
5. Determine the likely usage had the appliance not been recycled through the Program. (Would the appliance been kept as a primary or secondary appliance or transferred?)

For the subset of respondents who used their appliances only part time, the average number of months was 3.7 for secondary refrigerators and 3.8 for secondary freezers. Table 25 lists the part-use factors by category.

Table 25. CY 2013 Part-Use Factor By Category

Usage Type and Part-Use Category	Refrigerators			Freezers		
	Percent of Recycled Units	Part-Use Factor	Per-Unit Energy Savings (kWh/yr)	Percent of Recycled Units	Part-Use Factor	Per-Unit Energy Savings (kWh/yr)
Secondary Units Only	**n = 34**					
Not in Use	12%	0	0			
Used Part Time	29%	0.31	333			
Used Full Time	59%	1.00	1,081			
Weighted Average	**100%**	**0.68**	**734**			
All Units (Primary and Secondary)	**n = 70**			**n = 60**		
Not in Use	6%	0	0	8%	0	0
Used Part Time	14%	0.31	333	17%	0.32	385
Used Full Time	80%	1.00	1,081	75%	1.00	1,215
Weighted Average	**100%**	**0.84**	**912**	**100%**	**0.80**	**975**

Next, the Evaluation Team asked participants the likelihood that the appliances would have been operated had they not been recycled. For example, if surveyed participants said they would have kept a primary refrigerator in the absence of the Program, the Evaluation Team asked if they would have continued to use the appliance as their primary refrigerator or if it would have been relocated and used as a secondary refrigerator.

Participants who said they would have discarded their appliance in the absence of the Program were not asked about usage, as the future usage of that appliance would be determined by another customer.[7]

The Evaluation Team combined the historically based part-use factors in Table 25 with participants' self-reported actions had the Program *not* been available. The results, shown in Table 26, are the distribution of likely future usage scenarios and corresponding part-use estimates. The weighted average of these future scenarios produces the Appliance Recycling Program's 2013 part-use factor for refrigerators (0.78) and freezers (0.80).

[7] Since the future usage type of discarded refrigerators is unknown, the Evaluation Team applied the weighted part-use average of all units (0.84) for all refrigerators that would have been discarded independent of the Program. This approach acknowledges that discarded appliances might be used as primary or secondary units in the would-be recipient's home.

Table 26. CY 2013 Part-Use Factors By Appliance Type

Use Prior to Recycling	Likely Use Independent of Recycling	Refrigerator		Freezer	
		Part-Use Factor	Percent of Participants	Part-Use Factor	Percent of Participants
Primary	Kept (as primary unit)	1.00	1%		
	Kept (as secondary unit)	0.68	17%		
	Discarded	0.84	33%		
Secondary	Kept	0.68	20%	0.80	44%
	Discarded	0.84	29%	0.80	56%
Overall		**0.78**	**100%**	**0.80**	**100%**

The part-use factor for refrigerators increased considerably from the previous year, from 0.67 in CY 2012 to 0.78 in CY 2013. This increase is not surprising as CY 2012 was the first year of the Program and many first-year participants in a new recycling program are eager to get rid of appliances that they had not been using much prior to being recycled. The most notable change for the Program is the increase in the proportion of survey respondents who said they had been using their appliance full time; this increased from 61% in CY 2012 to 80% in CY 2013.

There were also fewer respondents who said they were not using their appliance at all prior to participating, as shown in Table 27. In CY 2012, 13% of refrigerators were not used at all for the year prior to being recycled compared to 6% in CY 2013. The part-use for freezers remained largely unchanged, down from 0.81 to 0.80 in CY 2013.

Table 27. Part Use by Calendar Year

Appliance	Part-Use Factor	
	CY 2012	CY 2013
Refrigerators	0.67	0.78
Freezers	0.81	0.80

Applying the part-use factor to the modeled annual consumption in Table 28 yields the average per-unit gross savings for the CY 2013.

Table 28. Appliance Recycling Program Gross Per-Unit Savings by Measure

Appliance	UEC (kWh/Year)	Part-Use Factors	Gross Energy Savings (kWh/Year)
Refrigerators	1,081	0.78	843
Freezers	1,215	0.80	975

Realization Rates

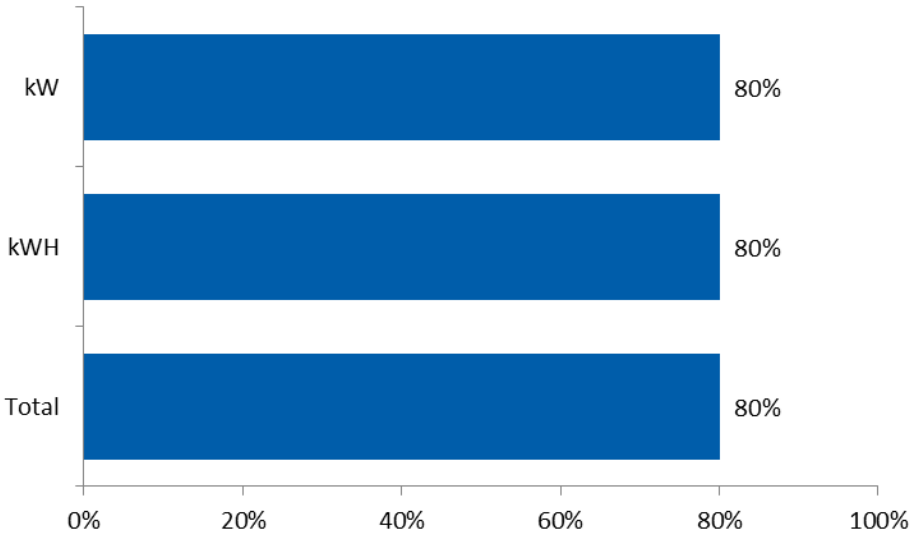
Overall, the Program achieved an evaluated realization rate of 80%. Thus, 80% of the gross savings reported in the Program tracking database have been verified to have been achieved in accordance with the Program operating criteria and previously agreed upon evaluation criteria.

Table 29. Appliance Recycling Program Realization Rate by Measure

Measure	Realization Rate
Refrigerator	79%
Freezer	84%
Total	**80%**

Figure 14 shows the realization rate by fuel type.

Figure 14. Appliance Recycling Program Realization Rate by Fuel Type



Gross and Verified Gross Savings Results

Table 30 lists the total and verified gross savings, by measure type, achieved by the Appliance Recycling Program in CY 2013.

Table 30. Appliance Recycling Program Gross Savings Summary

	Gross		Verified Gross	
	kWh	kW	kWh	kW
Total Annual	**25,569,705**	**3,827**	**20,459,217**	**3,062**
Total Life-Cycle	**204,557,640**	**3,827**	**163,673,735**	**3,062**

Evaluation of Net Savings

This section describes how the Evaluation Team assessed net Program savings.

Net-to-Gross Analysis

This section details the Evaluation Team's method for estimating the Program's net savings. In the case of appliance recycling, net savings are generated only when the recycled appliance would have continued to operate absent program intervention (either within the participating customer's home or at the home of another utility customer).

The key parameters in an appliance recycling program net-to-gross analysis are these:

- Gross per-unit savings
- Freeridership
- Secondary market impacts
- Induced replacement
- Spillover

As outlined in the UMP, the Evaluation Team employed a decision-tree approach to calculate and present net Program savings. The decision tree—populated by the responses of surveyed 2013 Program participants and information gathered from interviewed market actors from other appliance recycling program evaluations—presents all of the Program's possible savings scenarios.

The Evaluation Team used a weighted average of these savings scenarios to calculate the net savings attributable to the Program. Portions of the decision tree appear throughout this chapter to highlight specific aspects of the Evaluation Team's net savings analysis.

The decision tree accounts for both what the participating household would have done independent of the Program *and* for the possibility that the unit was transferred to another household, regardless of whether the would-be acquirer of that refrigerator finds an alternate unit instead.

Freeridership

The first step of the Evaluation Team's freeridership analysis entailed asking participants if they had considered discarding the participating appliance before they learned of the Program. Those participants who indicated no previous consideration to dispose of the appliance (that is, participants who had no pre-Program intentions to discontinue using the appliance) were categorized as non-freeriders.

The Evaluation Team then asked the remaining participants (those who had considered discarding the existing appliance before learning of the Program) a series of questions to determine the likely distribution of their units absent the Program. Independent of Program intervention, there are three possible scenarios:

- The discarded unit is transferred to another household.
- The discarded unit is destroyed.
- The unit is kept in the home.

To determine the percentage of units in each of the three scenarios, the Evaluation Team surveyed a sample of participants.

To ensure the most reliable responses—and to mitigate socially desirable response bias to the greatest extent possible—the Evaluation Team asked some respondents additional questions. For example, through interviews with market actors in multiple evaluations, the Evaluation Team determined that used appliance dealers are unlikely to purchase appliances more than 15 years old.

Regarding surveyed participants who had an appliance that was more than 15 years old *and* who indicated they "would have sold their unit to a used appliance dealer," the Evaluation Team asked what they would have likely done *had they been unable to sell the unit to a dealer*. Their responses to this subsequent question facilitated the Evaluation Team's assessment of freeridership.

After the final assessments of participants' actions independent of the Program, the Evaluation Team calculated the percentages of refrigerators and freezers that would have been kept or discarded (Table 31).

Table 31. Final Distribution Of Kept And Discarded Appliance

Stated Action Absent Program	Indicative of Freeridership	Refrigerators	Freezers
Kept	No	43%	50%
Discarded	Varies by discard method	57%	50%
Total		**100%**	**100%**

Secondary Market Impacts

When it was determined that a participant would have directly or indirectly (through a market actor) transferred the unit to another customer on the grid, the Evaluation Team's next question addressed what those potential acquirers might do since that unit was now unavailable (because it was recycled through the Program).

There are three possibilities:

- ***None of the would-be acquirers would find another unit (possibility A).*** That is, Program participation would result in a one-for-one reduction in the total number of refrigerators operating on the grid. In this case, the total energy consumption of avoided transfers (participating appliances that otherwise would have been used by another customer) should be credited as savings to the Program.
- ***All of the would-be acquirers would find another unit (possibility B)***. Thus, Program participation has no effect on the total number of refrigerators operating on the grid. In this case, none of the energy consumption associated with avoided transfers should be credited to the Program, as the total refrigerator load operating on the grid is essentially unchanged. This

position is consistent with the notion that participating appliances are necessities *and* customers will always seek alternative units when participating appliances are unavailable.

- ***Some of would-be acquirers would find another unit, while others would not (possibility C)***. In this case, those acquirers who were in the market for a refrigerator would acquire another unit, while others—those who would only have taken the unit opportunistically—would not acquire another unit.

It is difficult to answer this question with certainty, absent specific information from Focus on Energy regarding the change in the total number of refrigerators and freezers (overall and used appliances both) that were active before and after the implementation of the Program. As this information is rarely (if ever) available, UMP recommends adopting possibility C, that some of the would-be acquirers would find another unit, while others would not.

Therefore, in the absence of better information, UMP recommends that evaluators assume half (0.5, the midpoint of possibilities A and B) of the would-be acquirers of avoided transfers found an alternate unit. The Evaluation Team has applied this UMP recommendation to the Program evaluation.[8]

Once the proportion of would-be acquirers who found an alternate unit is determined (assumed to be half), the next question is whether the alternate unit was likely to be another used appliance (similar to those recycled through the Program) or, presuming fewer used appliances are available due to Program activity, a new standard-efficiency appliance instead.[9]

To determine the energy consumption of a new, standard-efficiency appliance, the Evaluation Team used information from the ENERGY STAR website and averaged the reported energy consumption of new, standard-efficiency appliances of comparable sizes and similar configurations as the Program units.

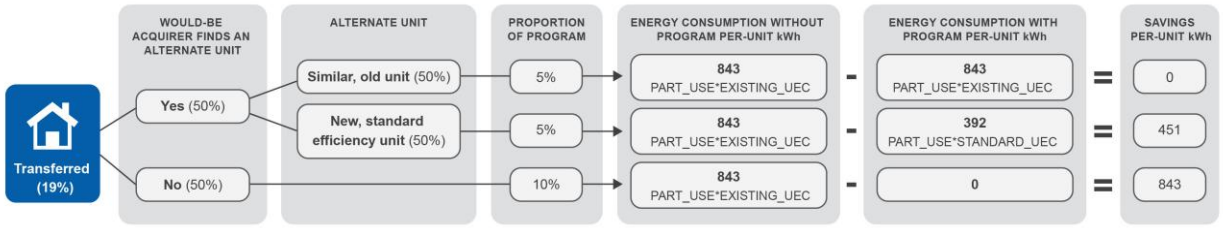
[8] Some evaluators have employed a bottom-up approach that focuses on identifying and surveying recent acquirers of non-program used appliances and asking these acquirers what they would have done had the specific used appliance they acquired not been available. While this approach results in quantitative data to support evaluation efforts, the Evaluation Team does not believe this approach yields reliable results since it is uncertain if: (1) the used appliances acquired are comparable in age and condition to those recycled; and (2) these customers cannot reliably respond to the hypothetical question. Any sample composed entirely of customers who recently acquired a used appliance seems inherently likely to produce a result that aligns with possibility B.

[9] It is also possible the would-be acquirer of a Program unit would select a new ENERGY STAR model as an alternate. However, it seems most likely a customer in the market for a used appliance would upgrade to the new lowest price point (a standard efficiency unit).

Figure 15 shows the methodology for assessing the Program's impact on the secondary refrigerator market and the application of the recommended midpoint assumptions when primary data are unavailable. As evident in the figure, accounting for market effects results in three savings scenarios:

- Full savings (per-unit gross savings)
- No savings (the difference in energy consumption of the Program unit and a similar, old unit)
- Partial savings (the difference between the energy consumption of the Program unit and the new, standard-efficiency appliance that was acquired instead)

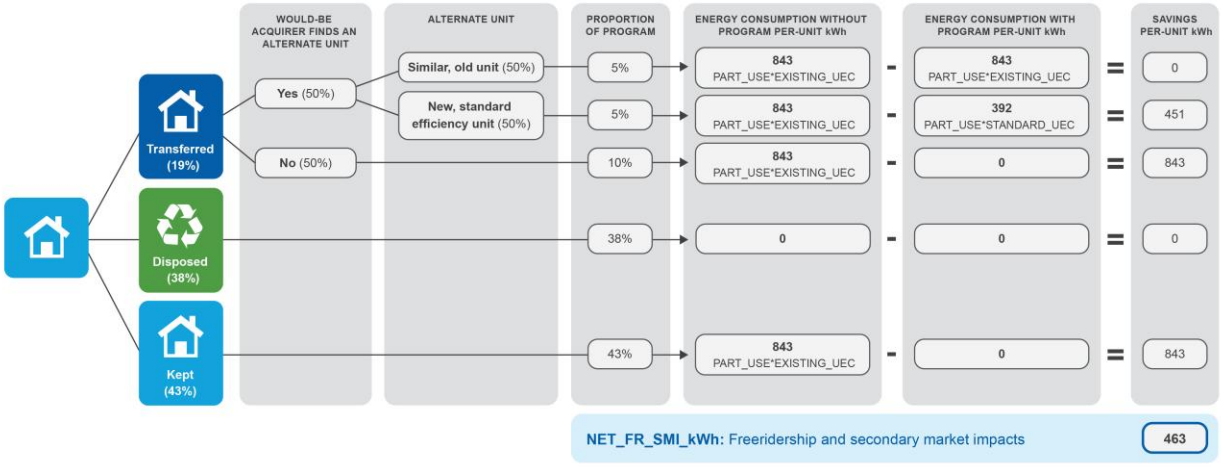
Figure 15. Secondary Market Impacts - Refrigerators



Integration of Freeridership and Secondary Market Impacts

Once the parameters of the freeridership and secondary market impacts are estimated, the Evaluation Team used the UMP decision tree to calculate the average per-unit Program savings net of their combined effect. Figure 16 shows how these values are integrated into a combined estimate of savings net of freeridership and secondary market impacts. Again, the application of secondary market impacts is the result of UMP and was not accounted for in previous evaluations of the Program.

Figure 16. Savings Net of Freeridership and Secondary Market Impacts – Refrigerators



Induced Replacement

UMP states that evaluators must account for the energy consumption of replacement units *only* when the program induces the replacement (that is, when the participant would *not* have purchased the replacement refrigerator in the absence of the recycling program).

The Evaluation Team relied on information from the participant survey to determine if any of the replacement refrigerators and freezers acquired by Program participants were induced by the Program. In total, 76% of participants replaced their refrigerators and 57% replaced their freezers. These results indicate that the Program both reduced the total number of used appliances operating within the its service territory and raised the average efficiency of the active appliance stock.

Next, the Evaluation Team estimated the proportion of these replacements that were induced by the customer's participation in the Program. All participants who indicated that they replaced the participating appliance were asked, "Were you already planning to replace your [Refrigerator/Freezer] before you decided to recycle your existing unit through the Focus on Energy Appliance Recycling Program?"

Since an incentive of $50 is unlikely to be sufficient motivation for most participants to purchase an otherwise-unplanned replacement unit (which can cost $500 to $2,000), when participants responded "No," the Evaluation Team asked a follow-up question. To confirm the participants' assertion that the Program alone caused them to replace their appliance, the Evaluation Team asked, "Let me make sure I understand: you would not have replaced your [Refrigerator/Freezer] with a different [Refrigerator/Freezer] without the Program? Is that correct?"

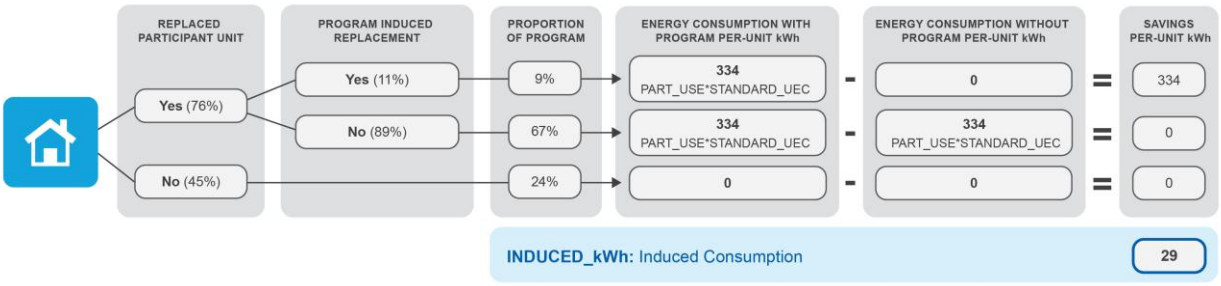
Induced replacement is not solely motivated by a program's incentive. The offer to remove the unit from the home (which often requires dealing with stairs) is a major driver of an appliance recycling program's high levels of customer satisfaction. The program's assistance in removing an appliance—which the customer may not have been able to remove independently—can also result in induced replacement.

To increase the reliability of these self-reported actions, the Evaluation Team's analysis of induced replacement also considered these factors:

- Whether or not the refrigerator was a primary unit.
- The participant's stated intentions in the absence of the Program. For example, if a participant said the primary refrigerator would have been discarded independent of the Program, the replacement was not induced (since it is unlikely the participant would live without a primary refrigerator). However, for all other usage types and stated intention combinations, induced replacement is a viable response.

The Evaluation Team's evaluation revealed that only a portion of the sampled replacements were induced in CY 2013: 9% of the 53 refrigerator replacements and 11% of the 35 freezer replacements.

Figure 17. Induced Replacement - Refrigerators



Using the UMP decision tree net-savings model, the Evaluation Team determined the final Program net-to-gross ratio. The evaluated or *ex post* net-to-gross represents the weighted average of Program-related scenarios.

Spillover

The Evaluation Team measured spillover by asking customers if their participation in the Program motivated them to install additional efficiency measures or to undertake additional efficiency-improving activities. The Evaluation Team then asked customers to report the Program's relative influence on their decisions to pursue these additional savings.

The Evaluation Team applied deemed savings values to the spillover measures that customers said they installed as a result of their Program participation and if the Program was highly influential in their decision to do so. The Evaluation Team produced the spillover percentage for a Program measure type using these two steps:

- Calculated the total of additional spillover energy savings reported by participants across the Program for a given measure type.
- Divided that sum by the total reported gross energy savings achieved by participants for that Program measure type, as reported in the customer survey.

Formally, this relationship for each measure type is:

$$Spillover\ \% = \frac{\sum Spillover\ Measure\ EnergySavings\ for\ All\ Survey\ Respondents}{\sum Program\ Measure\ Energy\ Savings\ for\ All\ Survey\ Respondents}$$

Spillover Findings

Spillover results when customers invest in additional efficiency measures or make additional energy-efficient behavior choices beyond those that are part of the Program. The Evaluation Team found one participant reported having a spillover measure that could be counted toward the Program. Table 32 shows the spillover measures that were attributed to the Program by survey participants and their associated energy savings.

Table 32. Appliance Recycling Program Spillover Measures

Appliance	Spillover Measure	Spillover Measure Savings (kWh)	Total Spillover Measure Savings (kWh)
Refrigerator	None	0	0
Freezer	Clothes Washer	196	196

Participants mentioned being highly influenced by the Program to purchase other measures—the most common response was CFLs. The Evaluation Team excluded this measure, however, because of the potential to double-count savings from the upstream Residential Lighting Program where it is impossible to identify participants.

Another respondent mentioned installing six new windows. However, this response was also excluded due to the high cost and scale of the improvement, which made it highly likely that the participant would have undertaken the project regardless of participation in the Program. The Evaluation Team notes that it is also difficult to quantify the savings of the windows measure without baseline information about the replaced windows such as size and orientation.

As shown in Table 33, the Evaluation Team estimated spillover as 0.2% of the Program savings. This represented a decrease from the 3% spillover found in the CY 2012 Program, due to fewer participants reporting additional energy-saving actions resulting from Program influence. This decrease was not large enough to have a statistically significant impact on the Program's net savings.

Table 33. Appliance Recycling Program Spillover Estimate

Program Measure Type	Survey Sample Spillover Savings (kWh)	Survey Sample Program Savings (kWh)	Percentage of Spillover
Refrigerator	0	53,101	0.0%
Freezer	196	52,655	0.4%
Overall	**196**	**105,755**	**0.2%**

Net-to-Gross Ratio

In order to calculate the net-to-gross ratio, the Evaluation Team used the following equation to combine all of the net impacts, and these results are presented in Table 34.

$$Net\ Savings\ (MWh\ per\ year) = Gross\ Savings - Freeridership\ \&\ Secondary\ Market\ Impact - Induced\ Consumption + Spillover$$

Table 34. Appliance Recycling Program Final Net-to-Gross Ratio by Appliance

Appliance	Gross Per-Unit Savings (kWh)	Freeridership and Secondary Market Impacts (kWh)	Induced Replacement (kWh)	Induced Additional Savings (Spillover) (kWh)	Net Savings (kWh)	NTG
Refrigerator	843	380	29	0	434	51%
Freezer	975	372	45	4	562	58%

As shown in Table 35, this yielded an overall net-to-gross estimate of 53% for the Program.

Table 35. Appliance Recycling Final Program Net-to-Gross Ratio

Appliance	Evaluated Participation	Evaluated Gross Savings (kWh)	Evaluated Net Savings (kWh)	NTG
Refrigerators	18,032	15,198,628	7,823,540	51%
Freezers	5,395	5,260,589	3,030,494	58%
Overall	**23,427**	**20,459,217**	**10,854,033**	**53%**

Net Savings Results

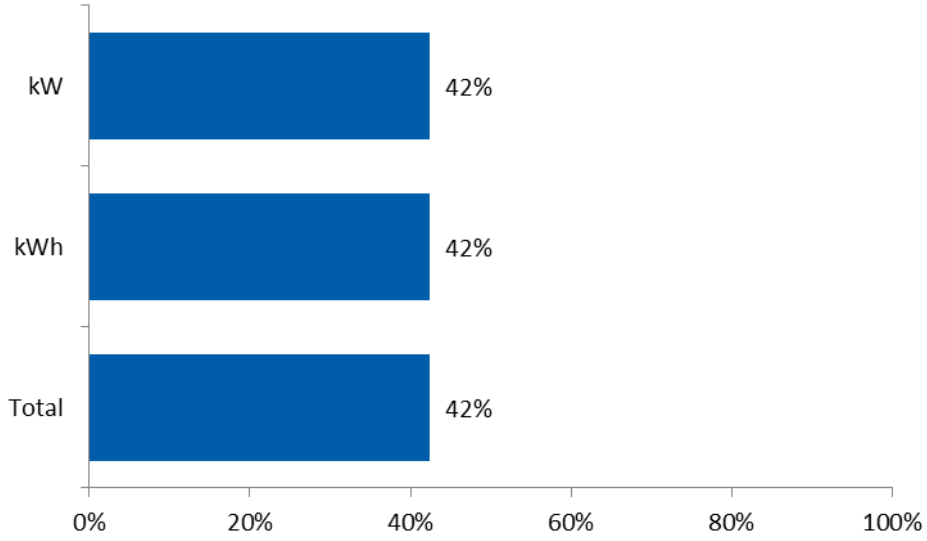
Table 36 shows the net energy impacts (kWh, kW) for the Program. The Evaluation Team attributed these savings net of what would have occurred without the Program.

Table 36. Appliance Recycling Program Net Savings

		Verified Net	
		kWh	kW
Total Savings	Annual	10,854,033	1,625
	Life-Cycle	86,832,265	1,625

Figure 18 shows the net savings as a percentage of the *ex ante* gross savings by fuel type.

Figure 18. Appliance Recycling Program Net Savings as a Percentage of *Ex Ante* Savings by Fuel Type



Process Evaluation

For CY 2013, the Evaluation Team addressed the key process research questions by conducting in-depth interviews with Program stakeholders and surveying participating customers. Table 20 above lists the number of completed surveys and interviews for the CY 2013 process evaluation.

The Evaluation Team focused on CY 2013 Program changes. Key recommendations from the CY 2012 evaluation were to:

- Adopt the modeled per-unit savings calculations for CY 2013.
- Continue to track changes in appliance characteristics.
- Assess the effect of providing a higher incentive in CY 2013.
- Continue to monitor the possibility of adding another recycling facility.

The Evaluation Team also reviewed Program materials and compared the materials to similar programs. The Evaluation Team assessed and evaluated the Program's status and any changes from CY 2012, its processes and management, and participants' experiences and satisfaction with the Program.

Program Design, History, and Goals

The Program Administrator was involved with the Program design and worked with the Program Implementer to establish both the measure mix and the incentive level. The CY 2013 Program offered customers free pick-up and recycling of old appliances with a $50 incentive for each refrigerator or freezer recycled (limited to two per customer per calendar year).

To be eligible for the Program, customers' refrigerators or freezers must have been: (1) in working condition; (2) between 10 and 30 cubic feet in size; (3) clean and empty on the day of pick-up; and (4) accessible via a clear, safe path for removal. The Program Implementer arranged for these appliances to be dismantled and recycled in an environmentally responsible manner.

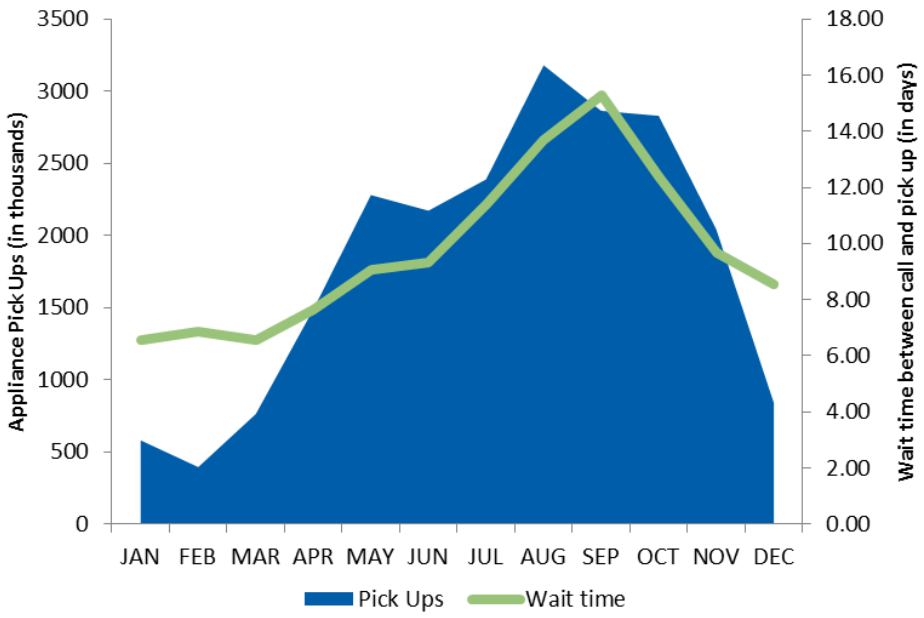
The CY 2012 incentive was $30, but the Program achieved only 93% of its goal of 14,400 units. Because The Program Administrator thought this amount did not sufficiently motivate customers, the CY 2013 incentive increased it to $50. The increase succeeded; in August 2013, the Administrator changed the Program's initial goal of 16,000 units to 20,000 units, and then increased it again later in the fall to 23,448 units, because participation was higher than originally targeted and the Program had the available budget.

The CY 2013 year-end total for the Program was 23,451 total units (18,050 refrigerators and 5,401 freezers), representing just over 100% of the Program Implementer's 23,448-unit target.

The Program Implementer and Program Administrator said there were few challenges to Program delivery during CY 2013. The Program Implementer's staff said their main challenge was keeping the volume of participation at a steady level.

Participation was low during the winter months, but once Implementer staff began marketing, participation picked back up. There is a similar distribution for the days between the customer's first call to the Program and appliance pick-up. As the number of appliance pick-ups increased around September, so did customer wait times. Figure 19 shows the number of units picked up and customer wait time for each month during CY 2013.

Figure 19. Appliance Pick-Ups and Wait Time by Month



Source: 2013 Program Orders Data

Program Management and Delivery

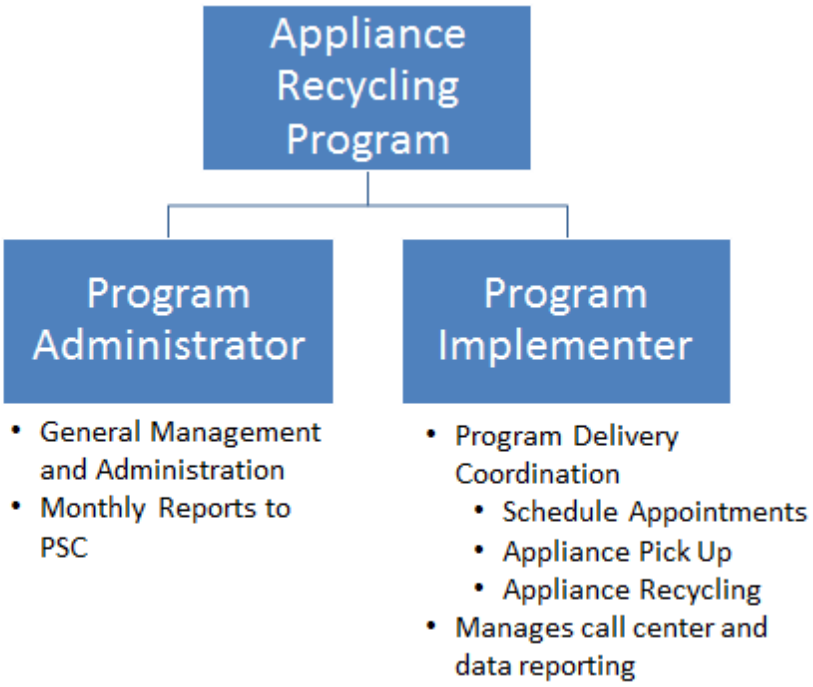
The Program Implementer operated the CY 2013 Program as designed, without any major changes. According to the Program Administrator, the CY 2013 Program ran very smoothly, considering the higher-than-anticipated participation. The Program Implementer responded to the higher participation by doubling its staff from 20 to 40 and the remote crews from one to two.

The Program Administrator reported a positive working relationship with the Program Implementer. Both the Program Administrator and Program Implementer reported their communication was successful overall, with frequent contact—weekly and sometimes daily, with a monthly in-person meeting.

Management and Delivery Structure

In CY 2013 the Program Administrator was responsible for management and administration, while the Program Implementer oversaw all aspects of Program delivery, including appliance pick-up and recycling and managing the call center and data reporting. Figure 20 shows a flowchart depicting the roles and responsibilities of the Program's key stakeholders.

Figure 20. Appliance Recycling Program Key Stakeholders and Roles



Program Data Management and Reporting

In CY 2013, the Program was fully integrated into Focus on Energy's SPECTRUM database, rather than tracked only in the Program Implementer's database as in CY 2012. In CY 2013, the Implementer began data collection then uploaded its data into SPECTRUM, where Program Administrator staff could process the data and issue payments. Because not all of the information in the Implementer's database has been loaded into SPECTRUM, staff continued to use that database to pull reports on certain parts of the process.

The Program Implementer's staff said they were exploring the possibility of changing from personal digital assistants to smartphones in CY 2014 to improve their field crew's data collection. The smartphone application would allow crews to input appliance data and would allow the Program to track crew location through GPS data. The latter would be particularly helpful for providing customers with advance notification if a crew is running late.

Marketing and Outreach

Marketing Materials

The Program CY 2013 marketing materials and promotional methods changed little from the CY 2012 materials, apart from noting the higher incentive amount. These materials were:

- Tear-away sheets explaining the Program
- Truck signs

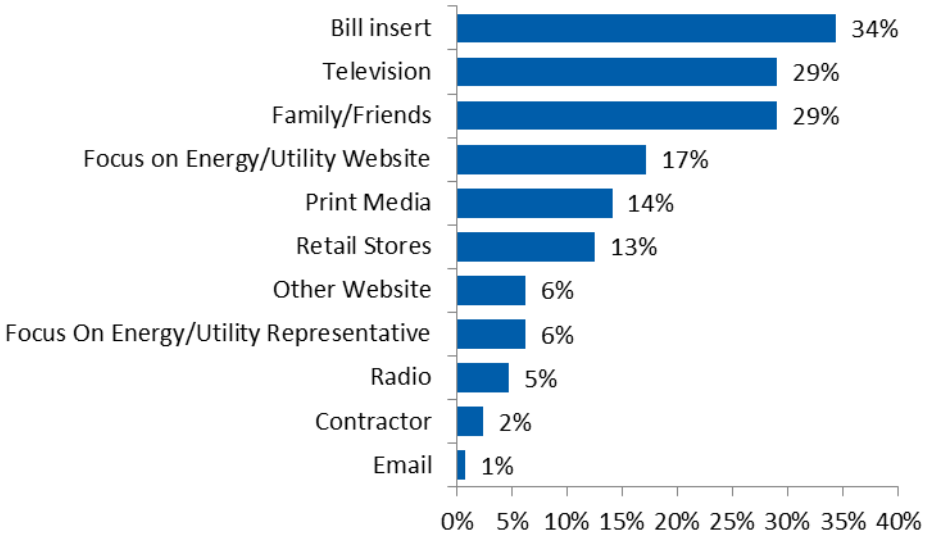
- Direct mail
- Utility bill inserts (noted in the Program Manual and the Mass Market Program Plan)
- Digital media (such as pay per click advertising, Yahoo.com, and Pandora.com)
- Television (15-second and 30-second spots)
- Newspaper (24-inch black-and-white advertisements)

One new marketing promotion from June to August in CY 2013 was an "oldest refrigerator" contest. The Program Implementer advertised and directed a three-month contest for customers who participated in the Program: the customer who recycled the oldest refrigerator won $1,000. The Program Implementer reported high customer participation. Utilities and media stakeholders were also excited about the contest and produced extra marketing.

The Evaluation Team surveyed 131 Program participants—70 who recycled a refrigerator and 61 who recycled a freezer—about their satisfaction with the Program, barriers and motivation to participation, demographics, and Program awareness.

Bill inserts are a highly effective outreach method; one-third said they learned of the Program primarily through bill inserts (Figure 21). This is consistent with findings from other appliance recycling programs across the country that show bill inserts to be the most effective way of reaching customers.

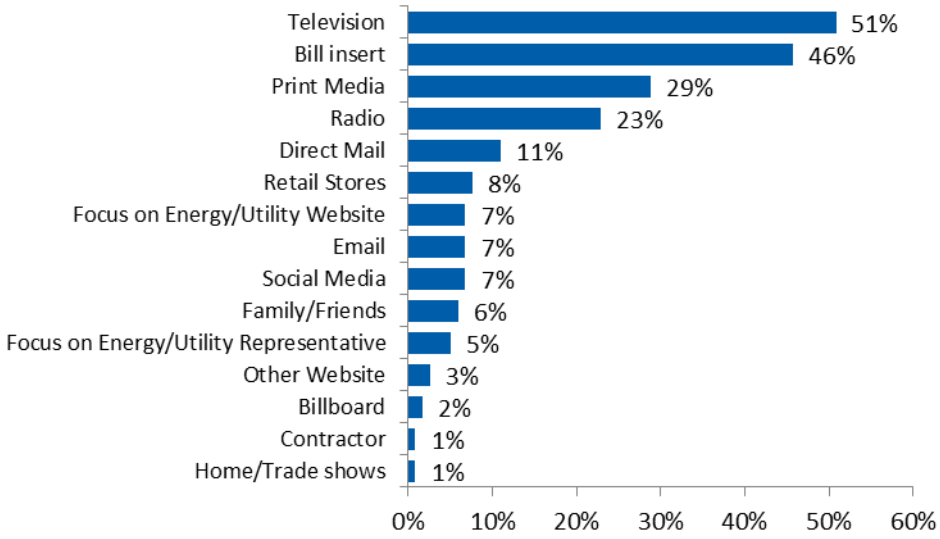
Figure 21. Customer Source of Awareness of Program



Source: Residential Appliance Recycling Program Participant Survey Question QB1: "Where did you MOST RECENTLY learn about Focus on Energy's appliance pick-up and recycling program?" (n=128)

As shown in Figure 22, participants identified several ways they could be reached with information about energy-efficiency programs. They preferred television, bill inserts and print media, and radio more than all other methods.

Figure 22. Best Methods for Program to Contact Participants



Source: Residential Appliance Recycling Program Participant Survey Question QB7: "What do you think is the best way for Focus on Energy to inform the public about energy-efficiency programs?" (n=118)

Customer Experience

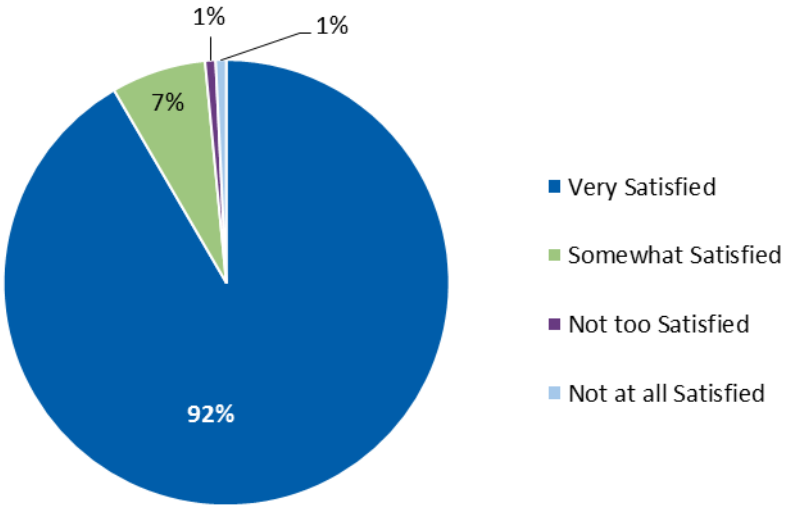
Customer Satisfaction

Both the Program Administrator and Program Implementer reported that CY 2013 participating customers were very satisfied with the Program. From their own data collection efforts, the Program Implementer's staff noted that over 90% of customers were satisfied with their participation.

The Program Implementer also maintained a complaint log, in which it filed complaints but excluded minor issues that were resolvable by a phone call. The Program Implementer reported that participant complaints were infrequent, with only a few customers complaining about how long it can take to get through to the Program call center during its busiest times.

Overall, 93% of survey respondents said they were "very satisfied" (Figure 23), supporting the Program Administrator and Program Implementer's statements. Of those respondents who said they were "not too" or "not at all" satisfied, one said it took too long to receive the incentive; one wanted the Program to recycle two other appliances but the Program did not (it is unknown what type of appliances these were and if they were eligible); one was unhappy with the pick-up crew; and one thought that sending a big truck a long way to pick up one appliance was not very energy efficient.

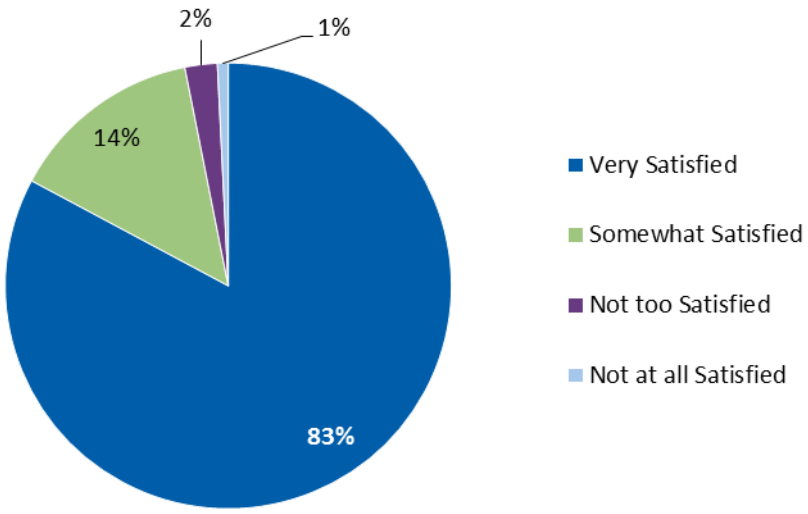
Figure 23. Overall Participant Satisfaction with the Program



Source: Residential Appliance Recycling Program Participant Survey Question QC8: "How satisfied are you with the Focus on Energy Appliance Recycling Program overall? Would you say..." (n=131)

The Evaluation Team's survey results showed that the majority of participants were satisfied with the rebate processing time (Figure 24). Participants said it took an average of 1.2 months to receive their rebate check. The one participant who said he or she was "Not at all satisfied" with the time it took to receive the check said it took five months to receive the check. Of the two who said they were "Not too satisfied," one said it took a month and one said it took a month and a half. The average of just over a month appears to be satisfactory for a majority of participants.

Figure 24. Participant Satisfaction with Rebate Check Timing

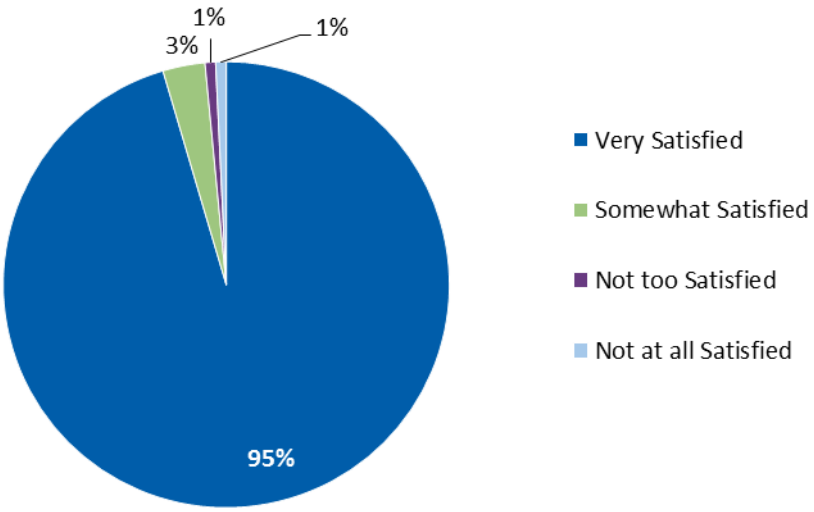


Source: Residential Appliance Recycling Program Participant Survey Question QC7: "How satisfied were you with the time it took to receive your incentive check for participating? Would you say..." (n=128)

Similarly, respondents said they were highly satisfied with the people who removed the appliance from their home, as shown in Figure 25. Almost all respondents (95%, n=131) who said they were satisfied with the appliance removal staff and thought that the appliance removal timing was "just about right."

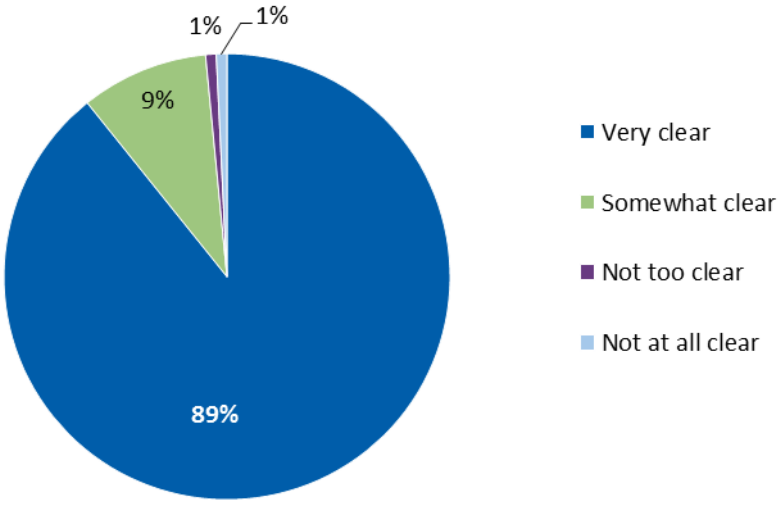
A majority of survey respondents said they found the participation instructions to be very clear, as shown in Figure 26.

Figure 25. Participant Satisfaction with Removal Staff



Source: Residential Appliance Recycling Program Participant Survey Question QC5: "How satisfied were you with the services of the people who removed your appliance? Would you say..." (n=131)

Figure 26. Clarity of Program's Participation Instructions



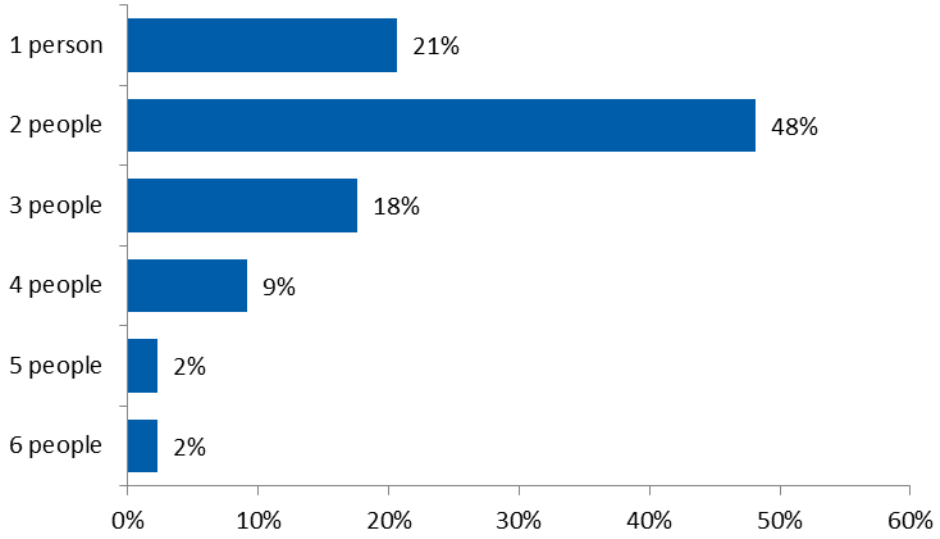
Source: Residential Appliance Recycling Program Participant Survey Question QC2:
"How clear were the Program's instructions for how to participate? Would you say..." (n=130)

Customer Demographics

Over two-thirds of survey respondents said they live in a house between 1,000 and 2,000 square feet. The Evaluation Team calculated the average respondent home to be 1,772 square feet. Half of the

respondents said there are two people living in their home, as shown in Figure 27. The Evaluation Team calculated an average of 2.31 residents per home for the survey respondents.

Figure 27. Participant Reported Occupancy Numbers



Source: Residential Appliance Recycling Program Participant Survey Question QI8:
"Including yourself, how many people currently live in this household on a full time basis?" (n≥131)

Decision Influences

In general, the participants were satisfied with the rebate amount they received and with the appliance disposal services. As Table 37 shows, 90% of respondents said they would have participated in the Program even if the rebate had been smaller, and 82% of those respondents said they would have participated without a rebate at all. While these responses are highly positive, the respondents did receive the $50 incentive by participating, and this may skew their responses toward a positive response to this question.

It is unknown how they would have responded if they had received a smaller or no incentive.

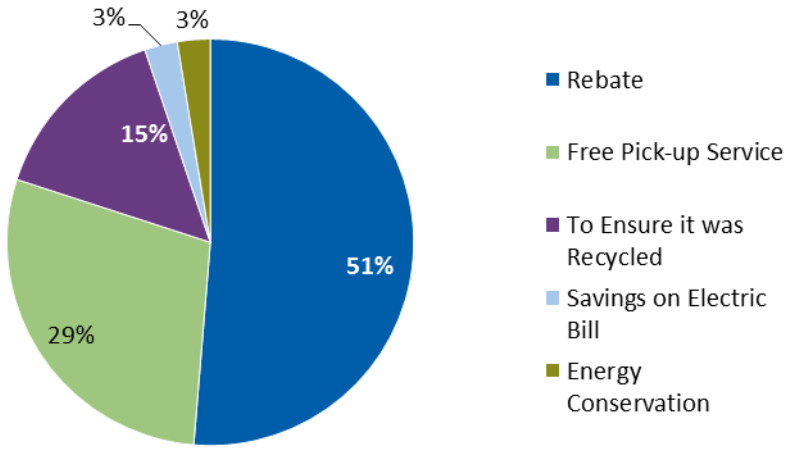
Table 37. Potential Participation with a Lower Rebate Amount

Question	Yes	No
Would you have participated in the Program if the amount of the rebate had been less? (n=124)	90%	10%
Would you have participated in the Program with no rebate check at all? (n=115)	82%	18%

Although survey respondents said they might have participated without the rebate, they also stated that the rebate was one of the key motivators for their Program participation. Over half said the rebate was the main reason they participated, as shown in Figure 28. The free pick-up service was the next highest response (29%), followed by ensuring that the appliance was recycled (15%).

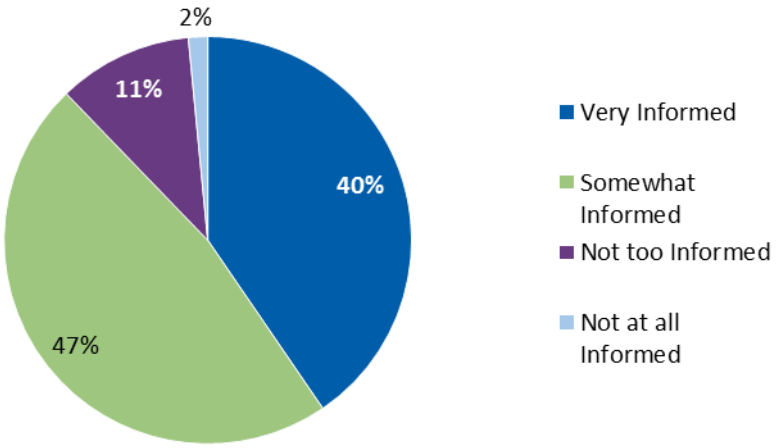
As Figure 29 shows, 87% of survey respondents said they feel very or somewhat informed about ways to save energy in their homes

Figure 28. Reasons Participants Participated in the Program



Source: Residential Appliance Recycling Program Participant Survey Question QG7: "What is the main reason you chose Focus on Energy's Program?" (n≥115)

Figure 29. Participant Feelings of Program Awareness

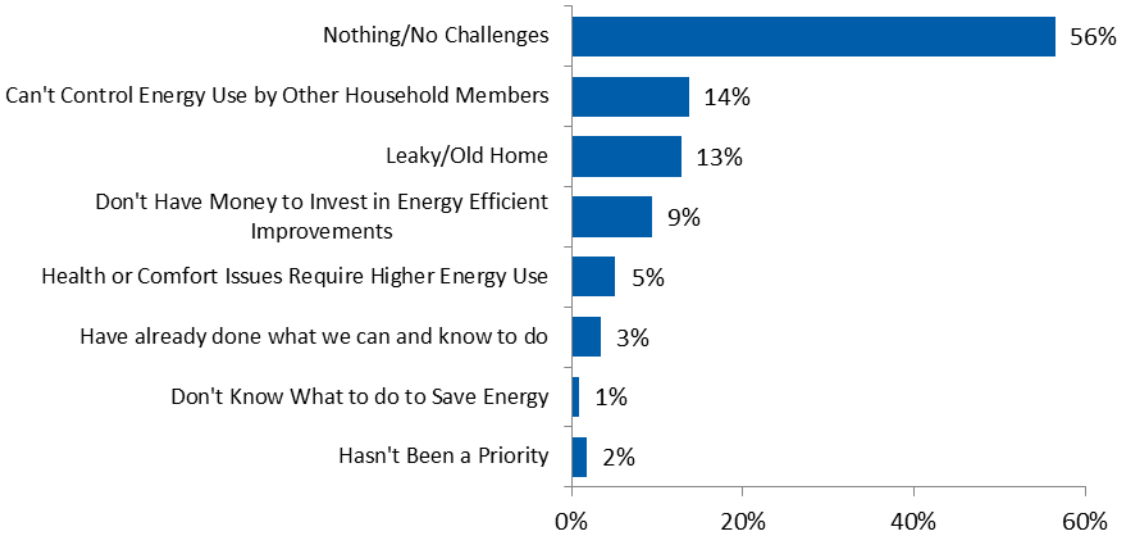


Source: Residential Appliance Recycling Program Participant Survey Question QB9: "How informed do you feel about all the ways you can save energy…?" (n=131)

Barriers to Saving Energy

When asked about making energy-saving changes in their homes, 56% of survey respondents said that they do not have any challenges to making such changes, as shown in Figure 30. Respondents mentioned several challenges, including not being able to control the energy use of other residents (14%), having a leaky or old house (13%), or not having money to invest in energy-efficiency improvements (9%).

Figure 30. Challenges to Saving Energy



Source: Residential Appliance Recycling Program Participant Survey Question QB13: "What challenges, if any, make saving energy difficult in your home?" (n=117)

Program Cost-Effectiveness

Evaluators commonly use cost-effectiveness tests to compare the benefits and costs of a demand-side management program. The benefit/cost (B/C) test used in Wisconsin is a modified version of the TRC test. Appendix I includes a description of the TRC test.

Table 38 lists the CY 2012-2013 incentive costs for the Appliance Recycling Program.

Table 38. Appliance Recycling Program Incentive Costs

	CY 2013	CY 2012-2013
Incentive Costs	$1,172,450	$1,575,140

The Evaluation Team found the CY 2013 Program to be cost-effective (a TRC benefit/cost ratio above 1). Table 39 lists the evaluated costs and benefits.

Table 39. Appliance Recycling Program Costs and Benefits

Cost and Benefit Category	CY 2013	CY 2012
Costs		
Administration Costs	$744,880	$485,493
Delivery Costs	$1,698,657	$1,107,141
Incremental Measure Costs	$-	$382,852
Total Non-Incentive Costs	$2,443,537	$1,975,486
Benefits		
Electric Benefits	$5,324,835	$2,326,628
Gas Benefits	$-	$-
Emissions Benefits	$1,980,283	$889,794
Total TRC Benefits	$7,305,118	$3,216,422
Net TRC Benefits	**$4,861,581**	**$1,240,936**
TRC B/C Ratio	**2.99**	**1.63**

Evaluation Outcomes and Recommendations

The Evaluation Team identified the following outcomes and recommendations to improve the Program.

Outcome 1. Participation in CY 2013 was higher than in CY 2012, higher than the Program initial target, and higher than the revised higher target.

Factors that could have influenced this are an increased incentive, success of the "oldest refrigerator" contest, and success of seasonal marketing efforts. However, increased marketing activity appeared to occur during the historically high-volume summer months. This may have exaggerated the Program's typical seasonal fluctuations in participation.

Outcome 2. Attempts to counteract seasonal variations in participation were not successful, and customer wait times increased during periods of high-volume participation.

Stakeholders reported challenges in keeping participation at a steady level, with participation at its lowest during fall and winter months and then peaking during the summer months when the Program was being actively marketed. The contest held by the Program took place during the peak participation months, likely compounding on peak seasonal participation.

Recommendation 2. Increase marketing efforts during spring and fall months (relative to summer). As much as possible, marketing should be focused on historically low-volume months (weather permitting), and less marketing should occur in high-volume months. Controlling seasonal fluctuations in participation levels will allow for a fuller use of Program resources and help prevent delivery challenges during high or low participation times. To this end, Focus on Energy should consider:

- Extending existing marketing efforts to take place during times of low participation.

- Enacting strategies similar to the contest that was held during CY 2013, since it was met with success and positive feedback, but during periods of low participation.
- Adding another pick up crew for peak seasonal participation times.

Outcome 3. Data tracking in SPECTRUM is insufficient to accurately reconcile with implementer tracking data.

Presently there is no way to identify individual units in SPECTRUM and the payment approval date does not match to any of the date records in the Program Implementer's tracking data.

Recommendation 3. Add both pick-up date and Unit IDs to SPECTRUM. This would allow identifying specific units and timeframes that are inconsistent between the two databases.

Outcome 4. Part-use increased by 13% for refrigerators. Net to gross stayed fairly consistent with 2012.

It is common to observe an increase in part-use as an appliance recycling program matures, so the 13% increase is in line with the Evaluation Team's expectations. However, future program years may experience further changes in either part-use or net-to-gross due to changes in appliance characteristics or customer behavior as the program continues to mature.

Recommendation 4. Continue to monitor changes in part-use and net-to-gross. Both part-use and NTG tend to change over time as programs mature and the characteristics and usage of the appliances recycled through the program changes.

Residential Lighting and Appliance Program

Through the Residential Lighting and Appliance Program (Program), Focus on Energy partners with retailers throughout Wisconsin to mark down the cost of CFLs, LED bulbs, and energy-efficient showerhead measures to offer instant discounts to residential customers on qualified products in participating stores. The Program also provides a wide range of retail support activities such as training, promotional events, and display materials. Additionally, the Program includes coupon-based offerings for CFLs if the retailer partner is unable to support an upstream mark down.

Applied Proactive Technologies (Program Implementer) oversees the implementation of the Program which includes managing the partnerships with retailers and manufacturers, tracking sales progress, and invoicing. In CY 2013, the Program expanded to offer additional LED products and high-efficiency clothes washers using instant discounts.[10]

Table 40 provides a summary of the Program's targets and actual spending, savings, participation, and cost-effectiveness.

Table 40. Residential Lighting and Appliance Program Actuals Summary[1]

Item	Units	CY 2013 Actual Amount	CY 2011-CY 2013 Actual Amount
Incentive Spending	$	$10,060,668	$16,436,568
Verified Gross Life-Cycle Savings	kWh	2,152,046,090	3,422,219,241
	kW	34,685	62,531
	Therms	1,081,361	1,385,864
Net Annual Savings	kWh	253,757,862	381,783,547
	kW	27,699	45,429
	Therms	31,441	45,397
Participation	Lighting[2]	7,258,873	12,346,816
	Showerheads	4,619	5,827
	Clothes Washers	4,999	4,999
Cost-Effectiveness	Total Resource Cost Test: Benefit Cost Ratio	6.10	3.29 [3]

[1] This table presents gross life-cycle savings to allow comparison with Focus on Energy's quadrennial gross life-cycle savings target, and net annual savings to allow assessment of the Program Administrator and Program Implementer's achievement of net annual savings.

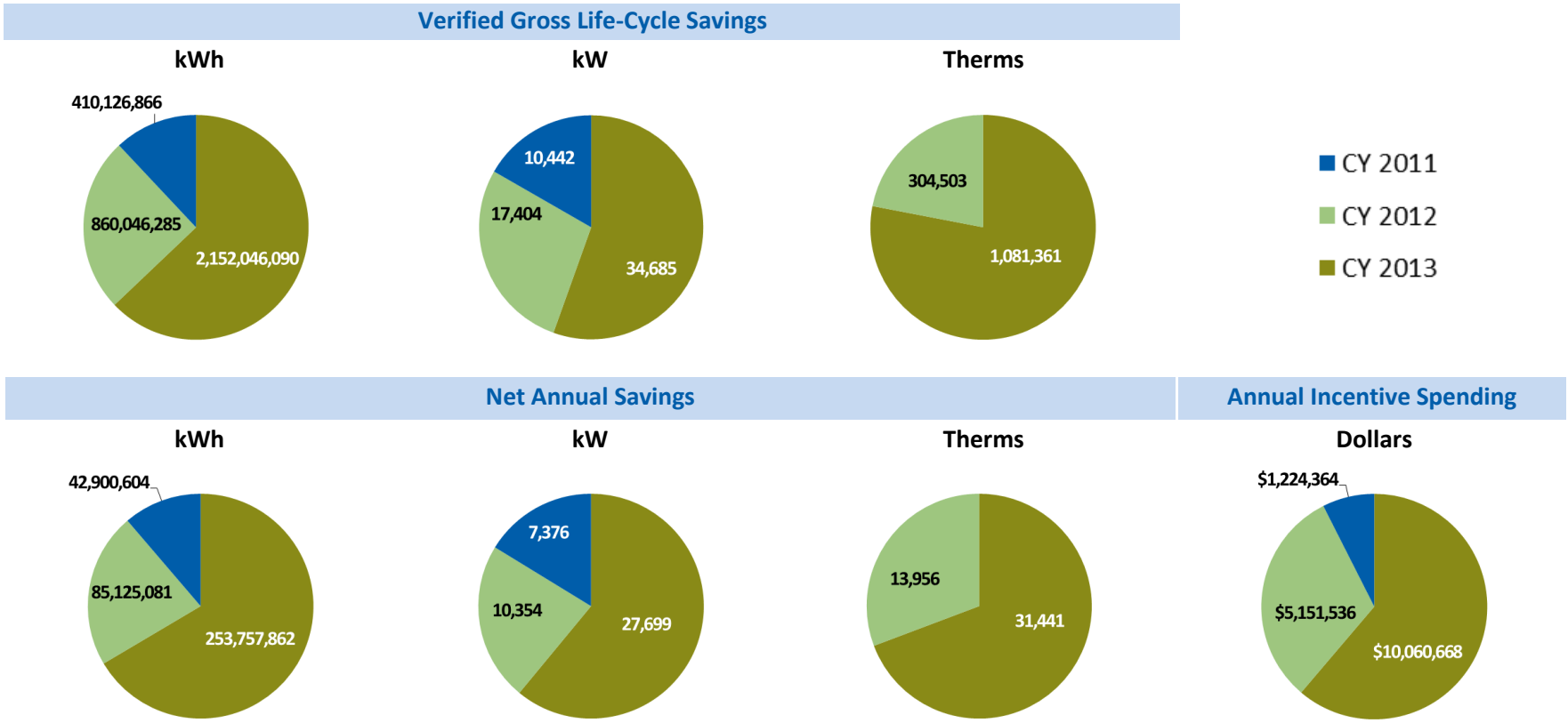
[2] Includes all bulbs including those used in commercial applications.

[3] The cost-effectiveness ratio is for CY 2012 only.

[10] In CY 2012, the program offered only one LED model, the L-Prize LED.

Figure 31 provides a summary of savings and spending progress made in CY 2011, CY 2012, and CY 2013. In 2011, only lighting products were offered which did not produce any therm energy savings. The Program began achieving therm savings by offering rebates on showerheads in 2012 and clothes washers in 2013.

Figure 31. Residential Lighting and Appliance Program Three-Year (2011-2013) Savings and Spending Progress



Participation

The CY 2013 Program provided incentives for 7,268,454 total measure units, of which 7,258,873 were light bulbs, 4,619 were showerheads, and 4,999 were clothes washers. To estimate the number of individuals who purchased bulbs, showerheads, and clothes washers in each calendar year, the Evaluation Team, in absence of precise data, assumed that participants were only buying one clothes washer and one showerhead annually. For lighting, the Evaluation Team relied on CY 2012 data obtained from customers who used coupons for purchases of compact fluorescent lamps or other bulbs through the Program (4.56 bulbs per person). As such, the CY 2013 total participation estimate for the Program is 1,601,063.

Due to decreased granularity in the CY 2013 coupon data, the Evaluation Team relied on CY 2012 coupon data to assume bulb purchases by customer. As noted in Volume I of this Evaluation Report, these coupons represent a small percentage of the overall bulb sales recorded in the upstream lighting program. Since customers do not interact directly with upstream programs, there are no other Program records available to determine participating customers. At this time, the data from the coupons are the best data available on unit purchases by customer.

Using the CY 2012 coupon data to estimate the average bulbs purchased per customer, is consistent with the approach used in CY 2012, CY 2011, and earlier evaluations. However, using the data lends itself to variability in calculating participants. Every year, the number of bulbs purchased per participant in each segment (residential, commercial, agricultural, etc.) fluctuates. In turn, the variability in segment participation rates reduces the transparency of the Program's exact influence on bulb sales and participation.

To provide context around the growth in participation over the quadrennial, Table 41 presents the total bulbs purchased in the upstream lighting programs in 2011, 2012, and 2013.

Table 41. Bulbs Purchased in Upstream Lighting Programs from CY 2011, CY 2012, and CY 2013[1]

Program	CY 2011 Bulbs	CY 2012 Bulbs	CY 2013 Bulbs
ENERGY STAR Lighting[2]	1,032,576	168,662	N/A
Residential Lighting and Appliance Program[3]	N/A	4,054,198	7,258,873
Total	1,032,576	4,222,860	7,258,873

[1]Includes legacy programs and carryover participation

[2]Program changed names in CY 2012 to the Residential Lighting and Appliance Program

[3]Program was launched in CY 2012

Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted impact and process evaluations for CY 2013. These were the key questions that directed the Evaluation Team's design of the EM&V approach:

- What are the Program's gross and net electric and gas savings?
- How can the Program increase its energy and demand savings?
- What is the Program process? Are key staff roles clearly defined?
- What are the barriers to increased customer participation and how effectively is the Program overcoming those barriers? What other barriers are specific to this Program and segment?
- How is the Program leveraging the current supply chain for measures and what changes can increase the supply chain's support of the Program?
- What is customer satisfaction with the Program?

The Evaluation Team designed its EM&V approach to integrate multiple perspectives in assessing Program performance. Table 42 lists the specific data collection activities and (where applicable) samples sizes used to evaluate the Program. Sample sizes were targeted to achieve a ±10% precision level with 90% confidence with the exception of the Clothes Washer Telephone survey which had a 80% confidence interval with a precision of ±10% target.

Table 42. Residential Lighting and Appliance Program Data Collection Activities and Sample Sizes

Activity	CY 2013 Sample Size (n)	CY 2011-2013 Sample Size (n)
Data Logger Retrieval (Single-Family Homes)	62	62
Data Logger Installation (Multifamily Homes)	72	72
Clothes Washer Telephone Survey	17	17
Lighting Telephone Surveys	223	474
Stakeholder Interviews[1]	2	2

[1] Stakeholders interviewed included the Program Administrator's Program Manager and the Program Implementer's Program Manager. Stakeholder interviews occurred yearly with the same stakeholders for a total of six interviews conducted over the CY 2011-2013 period.

Data Collection Activities

In June 2013, the Evaluation Team visited 62 single-family homes to remove data loggers that field staff had previously installed in December 2012. In July 2013, the Evaluation Team visited 72 Wisconsin residents' multifamily homes to install data loggers on up to five lights per home.[11] During both rounds of site visits, the Evaluation Team collected data about bulb and socket types, lighting usage, and storage rates. Appendix O provides detailed descriptions of the site visit findings.

[11] The Evaluation Team removed multifamily data loggers in January 2014.

In July and August 2013, the Evaluation Team employed a random-digit dial approach to contact residents who purchased CFLs during CY 2012 or CY 2013, via both landline and cellular numbers. This telephone survey included questions about Focus on Energy awareness, awareness and usage of CFLs and LED bulbs, purchases of CFLs, satisfaction with CFLs, and other energy-saving actions.

Forthcoming Research
The Evaluation Team will retrieve the 72 lighting loggers installed in multifamily homes, and report on the results of this study in the CY 2014 evaluation.

Additionally, the Evaluation Team surveyed 17 customers who received a Focus on Energy clothes washer incentive. The survey included questions about Focus on Energy awareness, motivations for purchasing the clothes washer, usage patterns and habits, prior equipment, freeridership, spillover, and Program satisfaction.

Lastly, interviews with the Program Administrator and the Program Implementer provided insight into the Program process, staff roles, barriers to increased participation, and effectiveness of the Program design.

Impact Evaluation

To calculate gross savings, the Evaluation Team reviewed the Program tracking data and then combined these with data from onsite audit data. To calculate net savings, the Evaluation Team used results from the Standard Market Baseline study, the Saturation study, and the Clothes Washer net-to-gross survey to determine freeridership and spillover.

Evaluation of Gross Savings

This section describes how the Evaluation Team assessed gross Program savings.

Tracking Database Review

The Evaluation Team reviewed the Program Administrator's tracking of CY 2012 measures for completeness and quality. Focus on Energy designed the SPECTRUM database to track participation and savings in real time, including helpful information such as measure, incentive per unit, packages sold, retailer, trade ally, energy and demand savings, and invoice dates. In CY 2013, the Program Implementer merged SPECTRUM with a separate tracking system previously used to monitor only the Program information in the form of an Excel spreadsheet called "2013 FOE Goals Tracker_FINAL."

The Evaluation Team found small discrepancies between total reported quantities and total savings between SPECTRUM and the Program Implementer's separate tracking system. Furthermore, adjustment measures could not be identified by specific measure type which resulted in the inability to disaggregate SPECTRUM reported savings into measure type.

The Evaluation Team found that the Program Implementer's separate tracking system was still more detailed and superior to the SPECTRUM database, and the Program Implementer still uses it as the primary tracking system. Specifically, SPECTRUM lacks the capabilities to track the following attributes that the Excel spreadsheet tracks, which are helpful for planning, and evaluation purposes:

- Bulbs sold
- Wattage
- Pack size
- Brand
- Model number
- Standard versus specialty
- Description (base type, shape, dimmability, three-way, etc.)

Implementer staff reported that they mostly use SPECTRUM for invoicing purposes—that is, to allow payment to partnering manufacturers—which happens only once or twice a month and involves a complicated approval process, resulting in a 30- to 50-day delay between the date of the invoice and when that data are updated in SPECTRUM.

In comparison, the Implementer staff inputs weekly sales data from partnering retailers into their separate tracking spreadsheet, allowing it to offer more up-to-date data than SPECTRUM.

The Evaluation Team used the information from the tracking spreadsheet and SPECTRUM, in conjunction with information gathered from the Program Administrator, to conduct engineering reviews for evaluating the verified gross electric and gas savings

Gross and Verified Gross Savings Analysis

To evaluate the verified gross electric and gas savings, the Evaluation Team reviewed the database and conducted engineering reviews of measures contributing the most energy savings.

Engineering Review

The Evaluation Team chose measures for the engineering reviews that were projected to contribute the largest savings over the quadrennial period (CY 2010 through CY 2014). The Evaluation Team plans to report all engineering review results (including measures not examined this year) in the CY 2013 Deemed Savings Report.

Although the results reported in the CY 2013 evaluation report do not include the adjustments from the engineering reviews, the Evaluation Team used deemed assumptions and algorithms provided by the Program Implementer in the form of work papers[12]—in addition to the Program data—to verify the measure-level savings, with the exception of the following assumptions:

- CFL in-service rate
- Water heater fuel type distribution (showerheads)
- Commercial usage of bulbs
- CFL and LED per unit kWh values

Compact Florescent Lamps In-Service Rate

The Evaluation Team determined first-year installation rates using data collected from 62 single-family homes and 72 multifamily homes during site visits (see Table 43). The Evaluation Team determined a CFL weighted average in-service rate of 85.8%. Focus on Energy assumed an installation rate of 97.3% based on a 2010 study for the California Public Utilities Commission (CPUC).[13]

Table 43. Residential Lighting and Appliance Program CFL Installation Rate

Bulb Status	Single-Family Homes	Multifamily Homes
Installed	1,159	731
In Storage	133	262
First Year In-Service Rate	89.7%	76.6%
First Year In-Service Rate (weighted by population)		**85.5%**

The Evaluation Team assumed an installation rate of 1.0 for LED bulbs. The Program Implementer assumed the same value. However, the Evaluation Team recommends further investigation of this assumption in future evaluations, as it is unlikely that consumers install all LED bulbs upon purchase. It is likely that the installation rate for LEDs is higher than the estimates for CFLs due to the higher cost and associated value.

Water Heater Fuel Type Distribution - Showerheads

For showerheads, the Program Implementer attributed 67.4% of the weighted savings to gas and 32.6% to electric based on assumptions made from 2009 Residential Energy Consumption Survey data. The Evaluation Team applied findings from audits performed as part of the Home Performance with ENERGY

[12] The Program Implementer provided four work papers for the Residential Lighting and Appliance Program: (1) CFL, Retail Store Markdown Measure Version 4; (2) LEDs, Retail Store Markdown Measure Version 4; (3) Clothes Washers, Retail Store Markdown Version 3; and (4) Showerheads, Retail Store Markdown Version 1.

[13] KEMA, Inc., The Cadmus Group Inc., Itron, Inc., PA Consulting Group, and Jai J. Mitchell Analytics. *Final Evaluation Report: Upstream Lighting Program. Volume 1.* Prepared for the California Public Utilities Commission, Energy Division, CALMAC Study ID: CPU0015.01, February 8, 2010

STAR Program by Conservation Services Group (CSG) in CY 2013 in Wisconsin. Of the 3,281 water heaters observed, 2,776 were fueled by natural gas, 10 by liquid petroleum, and 495 by electricity. Applying findings from this study, the Evaluation Team attributed 84.6% of the weighted savings to gas, 15.1% to electric, and the remaining 0.3% to liquid propane (see Table 44).

Table 44. Residential Lighting and Appliance Program Water Heater Fuel Type Distribution

Fuel Type	Saturation
Natural Gas	84.6%
Electric	15.1%
Propane/Liquid Petroleum Gas	0.3%

Commercial Usage of Bulbs

The Program Implementer assumed no lighting measures would be used by commercial customers. In 2012, the Evaluation Team conducted an intercept study in Wisconsin with 178 customers in 24 different stores across seven retailers. Customers who were buying light bulbs were asked where they were intending to install the light bulbs—at home or at a business. The Evaluation Team found that 7.05% of purchased bulbs were intended for commercial applications. Consequently, 7.05% of CFL bulbs purchased through the Program were allocated to the Nonresidential (Targeted Markets) Portfolio. See Focus on Energy Calendar year 2013 Evaluation Report Volume I for more details.

CFL and LED Per Unit kWh Assumptions

Using the Implementer's savings assumptions and algorithms, the Evaluation Team found small discrepancies, likely due to rounding or calculation errors, between the assumed values as reported in the Work Papers provided by APT and the Evaluation Team's recalculated per unit kWh values. Table 45 outlines the differences.

Table 45. Differences between Implementer and Verified Per Unit Assumptions

Measure Category	Implementer Per Unit kWh	Verified Per Unit kWh[1]
CFL – 17 to 22 watts	49.00	45.30
CFL – Weighted Average	**43.09**	**43.12**
LED – 750 to 1049 lumens	44.00	42.50
LED – 1050 to 1489 lumens	53.00	48.58
LED – Weighted Average	**36.00**	**34.71**

[1] Verified per unit savings represents the Evaluation Team's replication of implementer algorithms and inputs (including the implementer's ISR assumption), and does not represent *ex post* adjustments.

Wattage Allocation Review

The Evaluation Team reviewed the wattage allocation assumptions used to calculate the weighted average savings. As shown in Table 46, the Evaluation Team found that the projected distribution of sales matched very closely with actual sales. This indicates that the Program Implementer managed bulb sales distribution successfully through CY 2013.

Table 46. Comparison of Projected Wattage Allocation Assumptions and Actual 2013 Wattage Sales Distribution

CFL Wattage	Projected Percentage of Sales	Actual Percentage of Sales
Less than 12 watts	3%	3%
12-16 watts	73%	75%
17-22 watts	6%	5%
Greater than 22 watts	11%	10%
Specialty	7%	7%

Realization Rates

Overall, the Program achieved an evaluated realization rate of 104% weighted by energy (see Table 47). These realization rates include savings achieved by bulbs installed in commercial applications. Thus, the gross savings reported in the Program tracking database and in SPECTRUM have been verified to have been achieved and exceeded, in accordance with the Program operating criteria and previously agreed upon evaluation criteria.

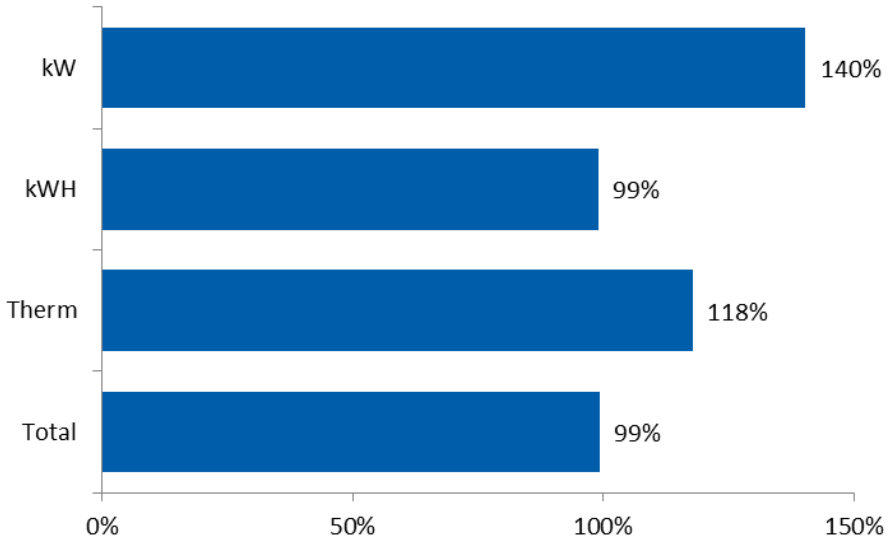
The low kWh and kW realization rates for showerheads is due to the Evaluation Team's use of different assumptions for water heater fuel type distribution and is offset by the high therms realization rate.

Table 47. Residential Lighting and Appliance Program Realization Rates by Measure

Measure Group	Realization Rates			
	kWh	kW	Therms	MMBtu
Lighting – All	99%	141%	N/A	99%
Showerheads	46%	45%	126%	103%
Clothes Washers	100%	100%	100%	100%
Total	**99%**	**140%**	**118%**	**99%**

Figure 32 shows the realization rate by fuel type.

Figure 32. Residential Lighting and Appliance Program Realization Rate by Fuel Type



Gross and Verified Savings Results

Table 48 lists the total and verified gross savings, by savings type, achieved by the Program in CY 2013.

Table 48. Residential Lighting and Appliance Program Gross Savings Summary

Savings Type	Gross			Verified Gross		
	kWh	kW	Therms	kWh	kW	Therms
Current Annual	314,956,253	24,724	89,482	311,837,741	34,685	105,447
Current Life-Cycle	2,531,539,032	24,724	921,715	2,152,046,090	34,685	1,081,361

Net-to-Gross Analysis

The Evaluation Team assessed net savings based on two key components: freeridership and spillover.

Freeridership Findings

Freeriders are participants who would have purchased the same efficient measure at the same time without any influence from the Program. For CY 2013, the Evaluation Team used two different methodologies to assess freeridership:

- For CFL lighting measures, the Evaluation Team applied results from 2012 analysis with an econometric price-response model populated with sales tracking data and marketing event information from the Program Implementer. The Evaluation Team considered updating this estimation using CY 2013 sales data but found that the data were relatively similar to CY 2012 and would likely yield similar results. Thus, the Evaluation Team used the same value from the CY 2012 analysis for the CY 2013 evaluation. Though, the Evaluation Team may consider using

an updated price-response model in the CY 2014 evaluation if the data contain increased price variation or more detailed marketing event and product placement information. A more robust description of CY 2012 price-response model can be found in the *Focus on Energy Calendar Year 2012 Evaluation Report Volume II.*

- For showerhead and clothes washer measures which were included in the Market Baseline Study, or where adequate market baseline data were available from other sources, the Evaluation Team applied a SMP methodology.
- For LEDs, the Evaluation Team assumes 0% freeridership. LEDs, compared to CFLs, are a newer and more expensive product: attributes which generally lead to lower levels of freeridership.[14]

SMP freeridership methodologies are described in detail in Appendix L. Overall the Program had an average freeridership of 40%, weighted by measure type savings.

Table 49. Residential Lighting and Appliance Program Net-of-Freeridership Percentage Estimates by Measure Group

Measure Group Name	Net-of-Freeridership Percentage Estimate[1]	Source of Freeridership Adjustment
Lighting CFLs	60%	Price Response Model
Lighting LEDs	100%	Assumed
Showerheads	48%	SMP
Clothes Washers	25%	SMP
Overall	**60%**	

[1] Based on MMBtu Savings.

Spillover Findings

Spillover results when customers invest in additional efficiency measures or make additional energy-efficient behavior choices beyond those rebated through the Program. For CY 2013, the Evaluation Team used two different methodologies to assess spillover:

- For CFL lighting measures, the Evaluation Team applied a saturation analysis to determine spillover. This analysis compared the change in CFL bulb saturation levels in Wisconsin to sales of Program bulbs over the same time period to determine spillover. A full description of the analysis can be found in Appendix L.

[14] While the LED freeridership is likely greater than 0%, in CY 2013, LEDs contributed less than 1% of total program gross MMBtu savings and therefore the Evaluation Team prioritized research on other measures. In future program years, if LEDs contribute a greater portion of savings, the Evaluation Team recommends further research on this subject.

- For clothes washer measures, the Evaluation Team applied a self-report methodology. The 17 participants in the Clothes Washer net-to-gross survey reported that the Program had no influence on their decisions to purchase and install other energy efficiency products.
- For LEDs and showerheads, the Evaluation Team assumes 0% spillover.[15]

As shown in Table 50, the Evaluation Team estimated spillover as 20% of the Program's savings.

Table 50. Residential Lighting and Appliance Program Spillover Estimates by Measure Group

Measure Group Name	Spillover Estimate	Source of Spillover Adjustment
Lighting CFLs	20%	Saturation Analysis
Lighting LEDs	0%	Assumed
Showerheads	0%	Assumed
Clothes Washers	0%	Self-Report
Overall	**20%**	

Net-to-Gross Ratio

In order to calculate a net-to-gross ratio, the Evaluation Team combined the saturation analysis, the SMP, and the self-report spillover results. Table 51 shows the net-of-freeridership savings by measure group and overall.

Table 51. Residential Lighting and Appliance Program Annual Net-of-Freeridership Savings by Measure

Measure Group Name	Annual Net-of-Freeridership Savings			
	kWh	kW	Therms	MMBtu
Lighting – CFLs	151,455,483	12,272	0	516,766
Lighting – LEDs	1,212,802	98	0	4,138
Showerheads	552,756	0	24,342	4,320
Clothes Washers	227,504	34	7,099	1,486
Lighting – Commercial CFLs	42,017,326	8,674	0	143,363
Adjustment Measures	(6,438,509)	(387)	0	(21,968)
Total	**189,027,362**	**20,691**	**31,441**	**648,105**

[15] In CY 2013, LEDs and showerheads had small contributions to total program gross MMBtu savings (less than 1% and 1%, respectively), and therefore the Evaluation Team prioritized research on other measures. Furthermore, given that both are upstream measures, the Evaluation Team was unable to utilize a self-report methodology. In future program years, if LEDs and showerheads contribute a greater portion of savings, the Evaluation Team recommends further research on this subject.

Based on these results, the Program net-to-gross ratio can be calculated in two ways:

$$NTG = 1 - Freeridership\ Ratio + Spillover\ Ratio$$

or

$$NTG = \frac{Net\ Savings}{Verified\ Gross\ Savings}$$

This yielded an overall net-to-gross estimate of 81% for the Program. Table 52 shows total net-of-freeridership savings, spillover savings, and total net savings in MMBtus.

Table 52. Residential Lighting and Appliance Program Savings and Net-to-Gross Ratio

Total Annual Net-of-Freeridership Savings (MMBtu)	Total Spillover Savings (MMBtu)	Total Annual Net Savings (MMBtu)	Program Net-to-Gross Ratio
648,105	220,860	868,966	0.81

Net Savings Results

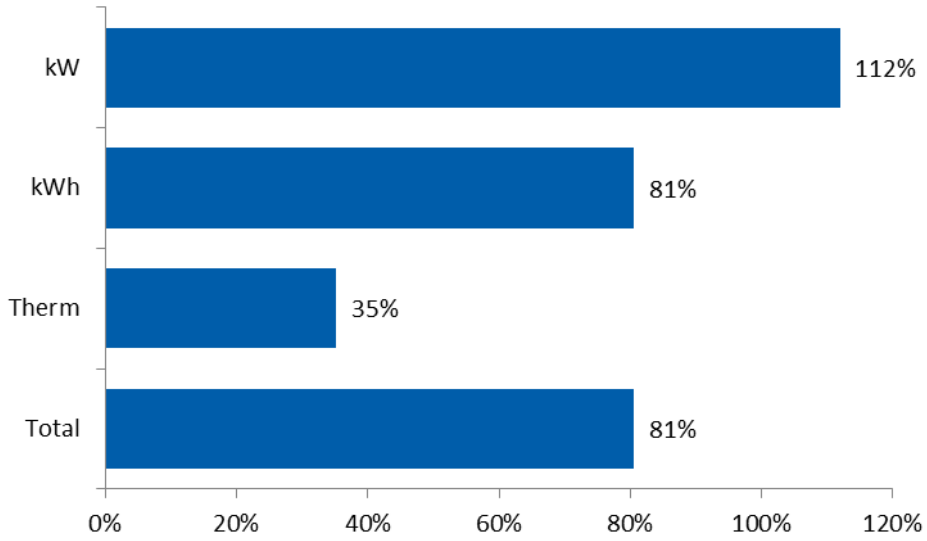
Table 53 shows the net energy impacts (kWh, kW, and therms) for the Program. The Evaluation Team attributed these savings net of what would have occurred without the Program.

Table 53. Residential Lighting and Appliance Program Net Savings

Savings Type	Verified Net		
	kWh	kW	Therms
Annual	253,757,862	27,699	31,441
Life-Cycle	1,311,736	27,699	122,907

Figure 33 shows the net savings as a percentage of the *ex ante* gross savings by fuel type.

Figure 33. Residential Lighting and Appliance Program Net Savings as a Percentage of *Ex Ante* Savings by Fuel Type



Market Effects

Market effects are systemic changes to standard business practices that are caused by program activities and tend to persist long after program interventions have ended. Market effects for the lighting measures describes customers who are "converted" to purchasing CFLs or LEDs by learning of them through the program and through increased availability on the store shelf. They bought the CFLs or LEDs, but they purchased them from nonparticipating stores, or they selected non-program CFL s or LEDs at a participating retailer.

The UMP for energy-efficiency programs states that market effects should be included in net savings. Since the Evaluation Team did not conduct any additional nonparticipant spillover research, reported net savings are conservative. However, the Evaluation Team developed an approach for consideration in future years to estimate those impacts for lighting measures. This approach compared the change in bulb sales between 2008 and 2013 and estimated market effects by subtracting Program bulbs from total bulbs sold during that period. A full description of the analysis can be found in Appendix L.

The Evaluation Team estimated market effects as 16% of CFL savings. Table 54 shows the market effects that would be attributable to the Program. The measured market effects savings capture the cumulative impacts between 2008 and 2013; thus, the amount that occurred in 2013 would be a fraction of what is reported in Table 54.

Table 54. Residential Lighting and Appliance Program Net Savings with Market Effects

Savings Type	kWh	kW	Therms
CFL Market Effects	53,026,519	5,750	0

Benchmarking Lighting Savings Inputs

The Evaluation Team compared a few of the deemed assumptions and algorithms that were associated with the CY 2013 savings analysis to similar upstream lighting programs. The Evaluation Team chose lighting measures for benchmarking because they contributed to the majority (99%) of Program savings. The Deemed Savings Report to be submitted in June 2014 will include this analysis' results and any suggested adjustments to the engineering reviews.

Through review of the SPECTRUM database assumptions and algorithms and subsequent literature review, the Evaluation Team identified the following items for CFLs:

- Hours-of-use (HOU)
- In-service rate (ISR)
- Coincidence factor (CF)

The Evaluation Team found that Focus on Energy's HOU and CF assumptions were within a reasonable range compared to values used in other upstream lighting evaluations. However, Focus on Energy's ISR lifetime assumption was one of only a few (most others used a first-year installation rate) and was the highest even when just comparing to other ISRs with adjustments for bulbs eventually moving out of storage. Appendix O contains the relevant references.

Hours-of-Use (HOU) – CFL

Table 55 shows that the Program Implementer's HOU assumption of 2.77 is within the middle range of values used by other comparable upstream lighting evaluations, though was the only value based on secondary research. Focus on Energy, via the Evaluation Team, conducted primary research on HOU in CY 2013 which will be reported in the 2013 Deemed Savings Report, to be submitted in June 2014.

Table 55. Residential Lighting and Appliance Program Comparison of Evaluated HOU Estimates

Source	Data Collection Method	Reported Year	HOU
EmPOWER MD Residential Lighting and Appliance Program	Primary: 131 site visits	2012	3.15
Maryland PUC Verification Report of Energy Efficiency Programs	Primary: 59 site visits	2011	2.98
Midwest Utility	Primary: 44 site visits	2011	2.91
New England Utilities: Residential Lighting Markdown Impact Evaluation	Primary: 157 site visits	2009	2.80
Wisconsin's Focus on Energy Work Paper	**Secondary research: New England SPWG Development of Common Demand Impacts Standards 2007**	**2013**	**2.77**
DTE Energy: CFL Hours of Use Study	Primary: 101 site visits	2012	2.60
Efficiency Maine Residential Lighting Program Evaluation	Primary: 41 site visits	2012	1.99
Midwest Utility	Primary: 51 site visits	2012	1.97
CPUC 2006-2008 Upstream Lighting Evaluation	Primary: 1,200 site visits	2010	1.80

In-Service Rate (ISR) – CFL

Table 56 shows that the Program Implementer's In-Service Rate assumption of 0.97 is above those values used by other comparable upstream lighting evaluations. While 0.97 is a lifetime ISR which assumes that 2.7% of all purchased bulbs are never installed and can't fairly be compared to first year installation rates, it is still on the higher side of studies which adjust for bulbs that will eventually leave storage and be installed. The ISR is the percentage of rebated units that are installed and operating.

Table 56. Residential Lighting and Appliance Program Comparison of Evaluated CFL ISR Estimates

Source	Data Collection Method	Reported Year	ISR	Notes
Wisconsin's Focus on Energy Work Paper	**Secondary research: 2006-2008 California Upstream Lighting Evaluation**	**2013**	**0.97**	**Assumes 2.7% of CFLs are never installed**
Wisconsin's Focus on Energy 2013 Evaluation	**Primary: Site visits**	**2013**	**0.86**	**N/A**
Midwest Utility	Draft Ohio TRM recommended calculation	2012	0.86	Adjustment for bulbs leaving storage
Midwest Utility	Draft Ohio TRM; Residential Lighting Markdown Impact Evaluation, Nexus Market Research, January 20, 2009.	2011	0.85	Adjustment for bulbs leaving storage
Xcel Energy Colorado Home Lighting Evaluation	Primary: 70 site visits	2009	0.82	Does not adjust for bulbs leaving storage
Maryland PUC Verification Report of Energy Efficiency Programs	Primary: 61 site visits	2011	0.81	N/A
Rocky Mountain Power Idaho 2009-2010 HES Evaluation	Self-reporting: 250 lighting surveys	2012	0.75	Does not adjust for bulbs leaving storage
Efficiency Maine Residential Lighting Program Evaluation	Primary: 41 site visits	2012	0.73	Does not adjust for bulbs leaving storage
Pacific Power California 2009-2010 HES Evaluation	Self-reporting: 251 lighting surveys	2012	0.71	Does not adjust for bulbs leaving storage
Pacific Power Washington 2009-2010 HES Evaluation	Self-reporting: 252 lighting surveys	2012	0.69	Does not adjust for bulbs leaving storage
Rocky Mountain Power Utah 2009-2010 HES Evaluation	Self-reporting: 250 lighting surveys	2012	0.69	Does not adjust for bulbs leaving storage
Midwest Utility	Self-reporting: 301 lighting surveys	2012	0.68	N/A
Rocky Mountain Power Wyoming 2009-2010 HES Evaluation	Self-reporting: 254 lighting surveys	2011	0.67	Does not adjust for bulbs leaving storage

Coincidence Factor (CF) – CFL

Table 57 shows that the Program Implementer's coincidence factor assumption of 0.082 within the range of values used by other comparable upstream lighting evaluations.[16] The coincidence factor is used to determine kW savings.

Table 57. Residential Lighting and Appliance Program Comparison of Evaluated CF Estimates

Source	Data Collection Method	Reported Year	CF
Efficiency Maine Residential Lighting Program Evaluation	Primary: 41 site visits	2012	0.180
Midwest Utility	Primary: 44 site visits	2011	0.122
New England Utilities: Residential Lighting Markdown Impact Evaluation	Primary: 157 site visits	2009	0.108
EmPOWER MD Residential Lighting and Appliance Program	Primary: 131 site visits	2012	0.090
Maryland PUC Verification Report of Energy Efficiency Programs	Primary: 59 site visits	2011	0.0974; 0.085
Wisconsin's Focus on Energy Work Paper	**Secondary Research: New England SPWG Development of Common Demand Impacts Standards 2007**	**2013**	**0.082**
CPUC 2006-2008 Upstream Lighting Evaluation	Primary: 700 site visits	2010	0.064

Lighting Use Findings

This section presents key highlights from the audit portion of the site visits performed In December 2012 and July 2013. These highlights present a snap shot of the current lighting market in Wisconsin. The full audit analysis can be found in Appendix O. Additional findings from the site visits on HOU and CF will be presented in the CY 2013 Deemed Savings Report, to be submitted in June 2014. The first study focused on lighting use in single-family homes.[17] The second study focused on lighting use in multifamily homes (defined as buildings with four or more units).

[16] Coincidence factors, as defined by the "New England SPWG Development of Common Demand Impacts Standards for Energy Efficiency Measures or Programs for the ISO Forward Capacity Market (FCM)" (the source of the Program Implementer's assumption) are defined as the fraction of the connected (or rated) load (based on actual lighting watts) reductions that actually occur during each of the seasonal demand windows. They are the ratio of the actual demand reductions during the coincident windows to the maximum connected load reductions.

[17] In order to remove the light loggers installed in single-family homes during the first site visits in December 2012, the Evaluation Team revisited the homes in July 2013. During the second visit, the Evaluation Team confirmed audit data for quality assurance purposes.

The following list summarizes the key findings from the two audit studies:

- LEDs comprise 2% of the single-family sockets and 1% of multifamily sockets. An LED bulb is more likely to be found in a single-family than in a multifamily home. Eighteen percent of single-family homes and 7% of multifamily homes had at least one LED bulb installed.
- Residents installed CFLs in 33% of all socket types. This number represents an increase in nearly 10% of over the 2009 Wisconsin study, which found CFL saturation to be 23.7% (NMR 2010).
- Residents most frequently installed CFLs in living room sockets (40%) and bedroom sockets (35%). They also typically installed CFLs in torchiere fixtures (50%), medium screw base sockets (40%), and three-way switch sockets (36%).
- There were two multifamily homes that had only energy-efficient lighting technologies installed—no incandescent bulbs. While this percentage of the multifamily population is very small (3%), this is the first study in any state that shows less than 100% penetration for incandescent bulbs.
- The majority of CFLs in use (62%) are 13-watt bulbs. Most of the remaining CFLs found in the study ranged from 15 to 26 watts.
- Approximately 62% of the sockets still have inefficient lighting. This represents the size of the technical potential.

In December 2012 and July 2013, the Evaluation Team collected the following lighting information from 62 single-family and 72 multifamily homes:

- Room types (e.g., living area, kitchen, bedroom)
- Fixture types (e.g., table lamp, ceiling fixture, recessed fixture)
- Bulb type (e.g., CFL, incandescent, LED)
- Bulb shape (e.g., twister, A-lamp, globe)
- Bulb wattages
- Specialty features (e.g., three-way functionality, dimmability)
- Socket types (e.g., medium screw base, candelabra, pin base)

To combine the data for single-family homes with the data for multifamily homes, the Evaluation Team weighted each study's results by the proportional size of each housing population. According to the 2009 Residential Energy Consumption Survey (RECS), 73.9% of Wisconsin homes are single-family and 26.1% are multifamily.[18]

[18] 2009 RECS: http://www.eia.gov/consumption/residential/data/2009/

Table 58 shows the penetration rate (that is, the proportion of participating homes where residents installed at least one bulb of a specified type) of various bulb types. As determined through the Evaluation Team's initial screening, all homes whose residents were surveyed or received a site visit had at least one CFL installed.

Table 58. Residential Lighting and Appliance Program Bulb Penetration

Bulb Type	Percentage Penetration		
Population	Single-Family	Multifamily	Weighted
CFL	100%	100%	100%
Halogen	10%	25%	14%
Incandescent	100%	97%	99%
LED	18%	7%	15%
Linear Fluorescent	68%	68%	68%

Source: Lighting audit study (n=62, 72 sites)[19]

Table 59 shows various bulb saturations (the proportion of total installed bulbs attributable to a particular bulb type) in all sockets and in medium screw base (MSB) sockets only.

Table 59. Residential Lighting and Appliance Program Bulb Saturation

Bulb Type	Saturation – All			Saturation - MSB Only		
Population	Single-Family	Multifamily	Weighted	Single-Family	Multifamily	Weighted
CFL	32.8%	35.0%	33.4%	41.4%	42.9%	41.8%
Halogen	0.5%	2.8%	1.1%	0.3%	0.8%	0.5%
Incandescent	56.1%	52.0%	55.0%	57.5%	54.9%	56.8%
LED	1.6%	1.4%	1.5%	0.4%	0.9%	0.5%
Linear Fluorescent	9.1%	8.8%	9.0%	0.4%	0.5%	0.4%

Source: Lighting audit study (n=62, n=72)

Incandescent bulbs represented more than half the bulbs installed in all socket types, with a weighted average of 27 incandescent bulbs installed per site. Residents installed CFLs in 33% of all socket types, for a weighted average of 16 CFLs per site.

As Table 60 shows, these numbers represent an increase from a 2010 study that showed CFL saturation to be from 15% to 26%. Residents still installed incandescent bulbs in the majority of Wisconsin's

[19] In this table and throughout this section, "n" is represented with the single-family population first, followed by the multifamily population, unless otherwise specified.

sockets. However, CFLs have gained ground, averaging one in three bulbs in use in all socket types, and averaging an even higher percentage (42%) in MSB sockets.

LEDs continue to represent a small portion of Wisconsin sockets: 2% of single-family sockets and 1% of multifamily sockets.

Table 60. Residential Lighting and Appliance Program Historical Bulb Saturations Comparison

Source	Data Collection Method	Reported Year	CFLs
Focus On Energy 2013 Evaluation	Primary: Site visits	2013	33%
Residential Multistate CFL Modeling	Primary: Site visits	2010	24%
The Market for CFLs in Wisconsin	Primary: Site Visits	2010	20%
Renewable Impact Evaluation Report	Self-reporting: 345 lighting surveys	2008	19%

For more detailed analysis from the two lighting audit studies and studies referenced in this section, please see Appendix O.

Process Evaluation

The Evaluation Team assessed the Program's processes and performance by gathering information from phone surveys and stakeholder interviews. These were the key areas of interest for CY 2013:

- How can the Program increase its energy and demand savings by reducing customer participation barriers or better leveraging supply chain support?
- Is there an opportunity to expand Program offerings or the channels through which it is offered?
- How effective are in-store demonstrations, an important means by which customers learn about the Program?

Program Design, History, and Goals

Focus on Energy has offered an upstream residential lighting program since 2006. In CY 2012, the Program Administrator renamed it the Program, because it combined both lighting—which expanded to include LED bulbs in CY 2012—and efficient showerheads. In CY 2013, Focus on Energy added high-efficiency clothes washers.

Program Design

The Program offers incentives to retailers and manufacturers to buy down the cost of CFLs, LED bulbs, efficient showerheads, and clothes washers. While these products are automatically available at a reduced price at most participating retailers, the Program also allows mail-in coupons for a few smaller rural participating stores. Participation at these stores is low, but the Program Administrator values keeping these stores engaged with the Program.

In CY 2013, more stores enrolled in the Program than originally anticipated; the largest of these was Walgreens. The Program now has over 1,000 participating stores. Due to this greater-than-expected

market demand, the Program Administrator added funding toward the end of CY 2013. Also in CY 2013, the Program Administrator made the following design changes:

- **High-efficiency clothes washers.** The Program Implementer added rebates for high-efficiency clothes washers. Stores applied the rebate to the clothes washer price. Stores also provided the Program Implementer with customer data generated from delivery data.

  When the Program Implementer released the request for proposal (RFP) to add high-efficiency clothes washers to the Program, many stores expressed interest in participating, particularly small, local retailers. The high interest from smaller stores gave the Program greater statewide coverage than initially expected. Although high-efficiency clothes washers are not as cost-effective as lighting measures, the Program Administrator and Program Implementer considered this addition successful because it generated customer interest and satisfaction.

- **LED products.** The only LED model offered in CY 2012 was the L Prize LED bulb. In CY 2013, the Program Administrator added other LED products and increased the budget from approximately $10,000 in CY 2012 to about $100,000 in CY 2013.

  Although qualifying LED bulbs were still limited to 800 lumens or more, the Program only covered ENERGY STAR-qualified, omnidirectional, A19 bulbs. Program designers made this specification because A19 bulbs are the most commonly used LEDs in residential applications.

- **CFL products.** In CY 2013, the Program Implementer launched a new initiative in which it negotiated CFL prices with manufacturers and distributed free bulbs through food banks. The first giveaway was in June 2013, with additional giveaways in September and October. The Program Implementer reported positive feedback from all who participated.

  In CY 2013, the Program stopped covering the entire cost of stores' CFL recycling receptacles. The Program now covers 50% of the cost. Even though the total bin cost is less than $90, this change prompted some retailers—mostly small retailers unwilling or unable to take on any of the cost—to stop offering a recycling option to their customers. Large retailers such as Home Depot and Lowe's already offered a CFL recycling option before the Program began.

- **SPECTRUM database.** The Program Implementer began using the SPECTRUM database to record incentives paid to Program participants. Prior to CY 2013, Implementer staff filed data on the Program's SharePoint site.

In order to support these design changes in CY 2013, the Program Implementer added a second staff coordinator and three field representatives.

The Program Administrator and the Program Implementer expect the CY 2014 Program to remain similar to the CY 2013 Program. Implementer staff will continue to monitor ENERGY STAR qualifications and sales; they anticipate that ENERGY STAR qualifications will remain the same and that the Program will easily meet CY 2014 sales goals.

Goals

The Program Implementer determined Program sales goals and submitted them to the Program Administrator for approval. The Program Implementer based the sales goals on the Program's performance and on similar performance during the prior year, as well as on retailer and manufacturer sales projections.

In CY 2013, the Program exceeded its CFL and met its clothes washer sales goals. The Program Administrator added funding toward the end of CY 2013 to continue offering discounted CFLs to customers.

CY 2013's LED bulb sales performed according to expectations. The Program Implementer set low sales goals for the LED bulbs to prioritize the sales of CFLs, the more cost-effective measure.

These sales are shown in Table 61.

Table 61. Residential Lighting and Appliance Program Performance

Program	CY 2013 Sales (Units)	CY 2013 Incentives ($ Spent)
CFLs	7,245,607	$9,430,364
LED Bulbs	13,229	$99,905
Showerheads	4,619	$30,499
Clothes Washers	4,999	$499,900

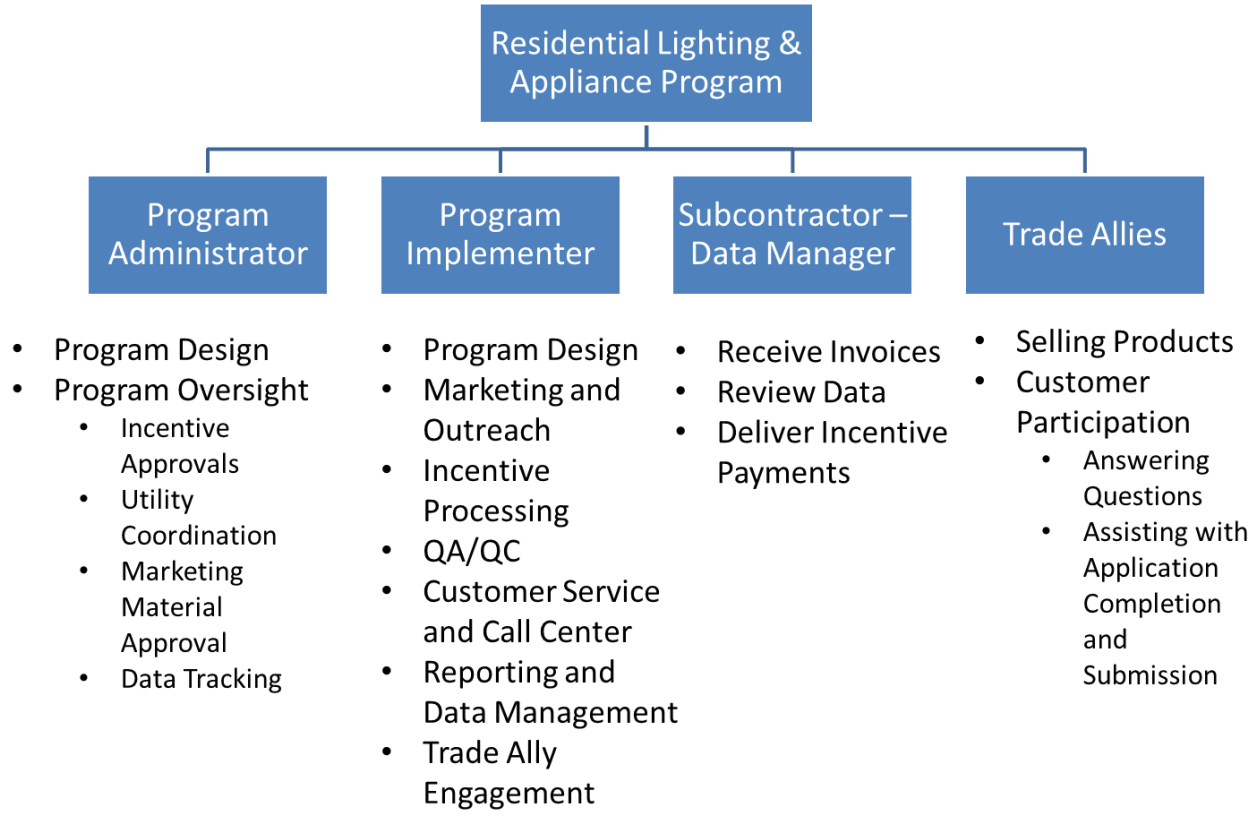
Program Management and Delivery

The Public Service Commission of Wisconsin (PSC) oversees the Program Administrator, which has authority over all of Focus on Energy's programs, including the Program. The Program Administrator hired the Program Implementer to implement the Program and Data Manager to handle Program data.

Management and Delivery Structure

Figure 34 shows a flowchart depicting the Program's management structure.

Figure 34. Residential Lighting and Appliance Program Key Stakeholders and Roles



The Program Administrator is responsible for the following:

- Developing brand standards and approving the Program Implementer's marketing materials
- Approving and signing memorandums of understanding (MOUs) with retail partners and manufacturers
- Coordinating with utilities
- Facilitating coordination across all programs
- Managing communications to stakeholders
- Providing customer service
- Managing the Program performance

The key Administrator staff members responsible for delivery are the Director of Operation, who oversees the high-level functioning of all efforts, and a Program Lead, who is responsible for communicating with the Program Implementer and making decisions on direction.

The Program Implementer is responsible for the following:

- Performing retailer outreach
- Negotiating incentive levels with retail partners
- Administering rebate payments
- Creating point-of-purchase marketing materials
- Overseeing field staff
- Training retail staff
- Educating customers about Program offerings
- Developing Program MOUs

Key Program Implementer staff members include the a Program Director, a Program Manager, two Program Coordinators, a senior field representative, and 12 regular field representatives. The Program Coordinators work with the Program Manager and the field staff to review all information coming in from the field, process payroll, prepare reports, and provide support to the field representatives.

Field representatives visit the largest participating stores every week, the smaller stores every other week, and the smallest stores monthly. On average, Implementer staff members visit stores twice a month.

The field representatives are also responsible for finding new stores to add to the Program. Although ideally the manufacturers are supposed to notify the Program Implementer about new stores, often the field representatives discover new stores while visiting other participating stores. Dollar stores, in particular, are often new businesses, and field representatives take the initiative to introduce these stores to the Program.

The Data Manager handles Program data under subcontract to the Program Implementer. The Data Manager receives invoices from retailers and manufacturers, then reviews the data, prepares data files for upload into the Program database, and uploads the data to SPECTRUM.

During interviews, staff from both the Program Administrator and the Program Implementer said the Program was adequately staffed, communication was strong, and the Program was running well overall.

Data Management and Reporting

The Data Manager receives invoices and Program sales data either every week or every other week, depending on the manufacturer and the retailer. At the minimum, participants are required to submit their invoices every 30 days. Data Manager staff members review the sales data to ensure compliance with the Program's MOU, which outlines Program bulb incentive levels, and then send the data to the Program Implementer for preliminary review. Following this review, the Data Manager uploads the data

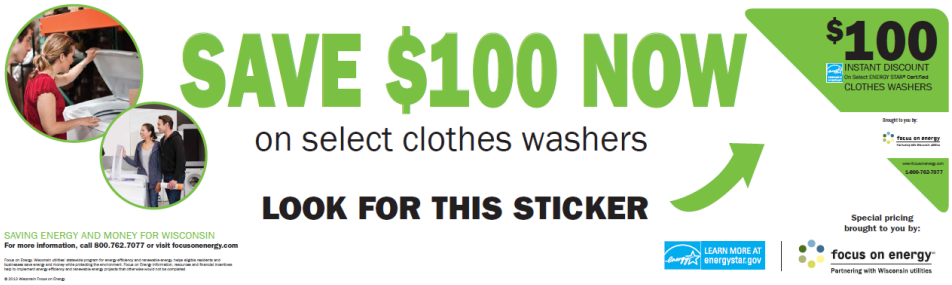
into SPECTRUM. If the Program Implementer does not identify any discrepancies in the database, they send approval for payment.

Initially, the SPECTRUM system for storing Program data and invoices in CY 2012 was a challenging process. (Previously, Implementer staff recorded data files on SharePoint.) Although Implementer staff members do not think SPECTRUM saves time, they recognize that it allows the PSC to more quickly and easily see Program results.

Program Materials

In-store signage is the primary and most remembered form of Program marketing; phone survey responses influenced the design. Figure 35 shows an example of store signage that tells customers how to save money on clothes washers.

Figure 35. Example of Store Signage



Marketing and Outreach

At the Program's inception, the Program Administrator hired a marketing communication specialist firm to design the marketing campaign and brand standard for all of Focus on Energy. Once these were in place, the Program Implementer became responsible for the marketing strategy.

In addition to the primary strategy of in-store signage, Focus on Energy advertises the Program on its website and on fact sheets handed out with CFLs at food banks. Field representatives also conduct in-store demonstrations, where they can address customers' misconceptions about CFLs. For example, in CY 2013, the most common concern customers expressed to retailers was about the mercury content in CFLs. Customers also complained about CFLs' light color. Implementer staff said field representatives can easily assuage both concerns during in-store demonstrations.

The Program Implementer did not tailor marketing messages to specific customer segments or specific seasons. Because large home improvement stores such as Home Depot are the largest sellers of Program measures and in-store marketing has been the most effective marketing strategy, the Program Implementer said it is best to continue with a marketing approach that is not segmented and heavily focused on in-store signage.

Although the Program Implementer's tracking does not link marketing to Program sales, Program Administrator staff stated that the strong performance proves its marketing efforts' effectiveness. During the CY 2013 in-store demonstrations, Implementer field representatives said they had interacted with more knowledgeable customers and that customers said they came to the store just to purchase discounted measures. Implementer staff said this increase in customer awareness could be due to Focus on Energy's educational efforts.

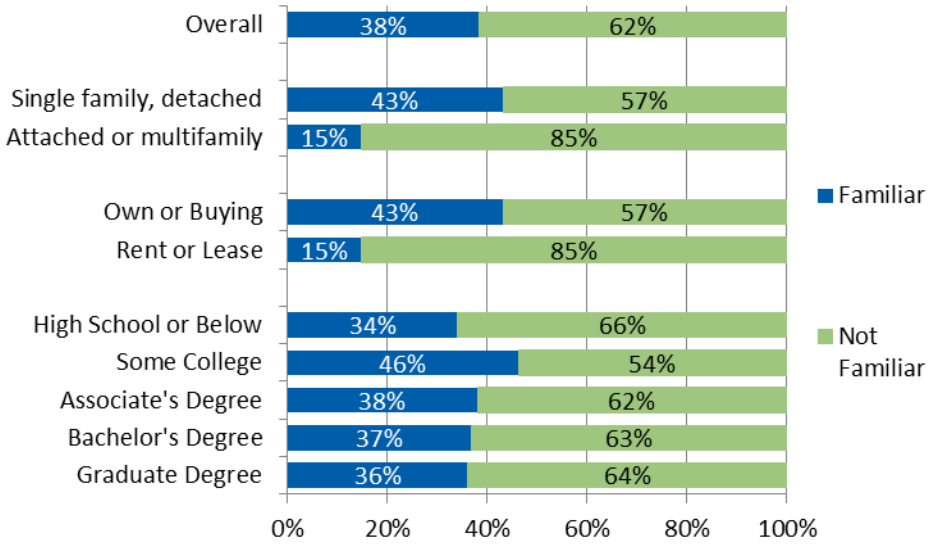
Customer Perspective

The Evaluation Team assessed customer perspectives from surveys with 223 people living within the Wisconsin Focus on Energy territory. The Evaluation Team used these responses as a proxy for Program participation since it is not possible to track participants in an upstream program.

The lighting phone survey indicated that 38% of the customers were familiar with Focus on Energy. In the CY 2012 phone survey, 46% were familiar. This drop in familiarity is statistically significant.

Figure 36 shows familiarity with Focus on Energy by different demographic groups. There is a statistical difference in familiarity between homeowners and renters and between people living in single-family homes and multifamily homes.

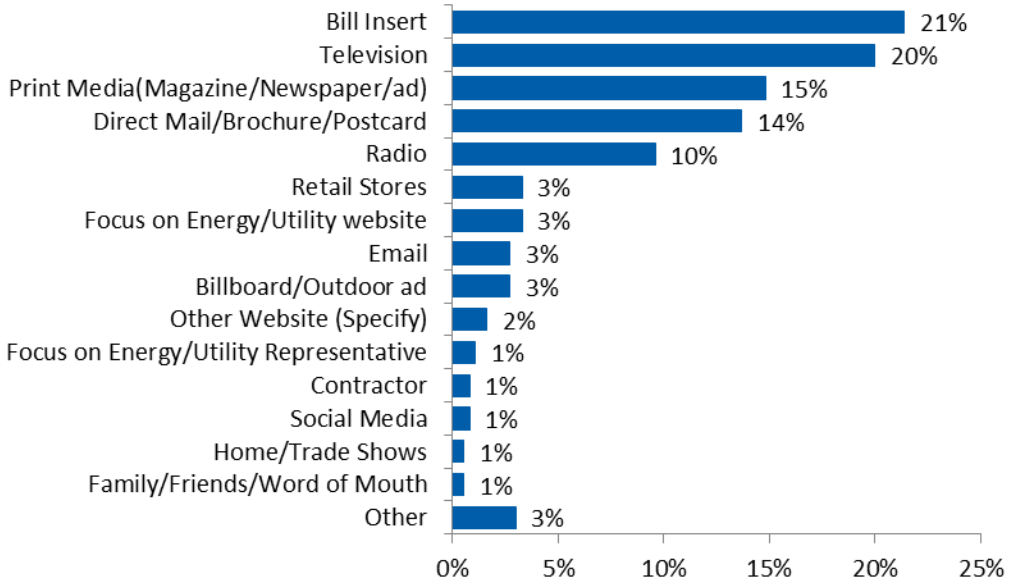
Figure 36. Familiarity with Focus on Energy



Source: Wisconsin Focus on Energy Residential Lighting and Appliance Program Phone Survey; QA1. "Are you familiar with Focus on Energy?" (n≥221)

The survey asked customers the best way to inform them about energy-efficiency programs. Customers' most common responses were bill insert (21%), television (20%), print media (15%), and direct mail/brochure/postcard (14%), as shown in Figure 37.

Figure 37. Best Way to Inform the Public about Energy-Efficiency Programs

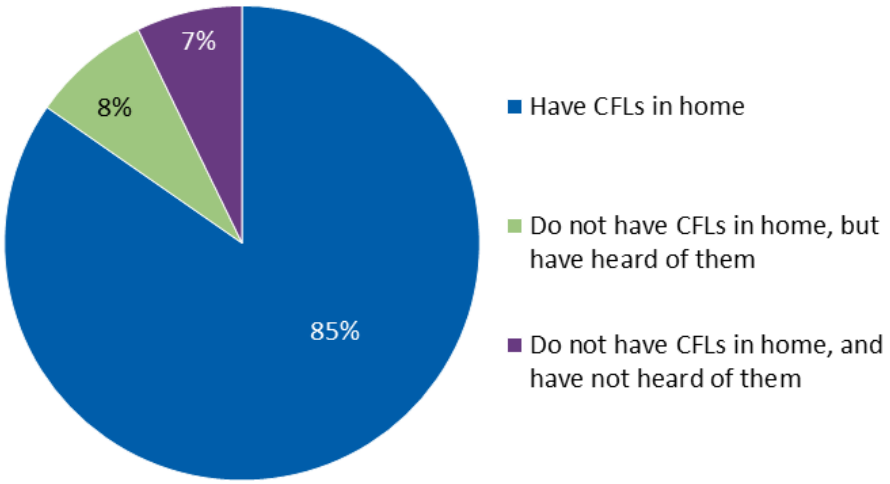


Source: Wisconsin Focus on Energy Residential Lighting and Appliance Program Phone Survey; QA20. "What do you think is the best way for Focus on Energy to inform the public about energy-efficiency programs?" (n≥365)

Awareness of Energy-Saving Light Bulbs

The majority of survey participants were aware of CFLs (93%) and 85% had CFLs installed in their home. Only 7% had not heard of CFLs (see Figure 38). Levels of awareness were generally unchanged from CY 2012, when 95% were aware, 85% had CFLs installed in their homes, and 4% hadn't heard of CFLs.

Figure 38. CFL Awareness



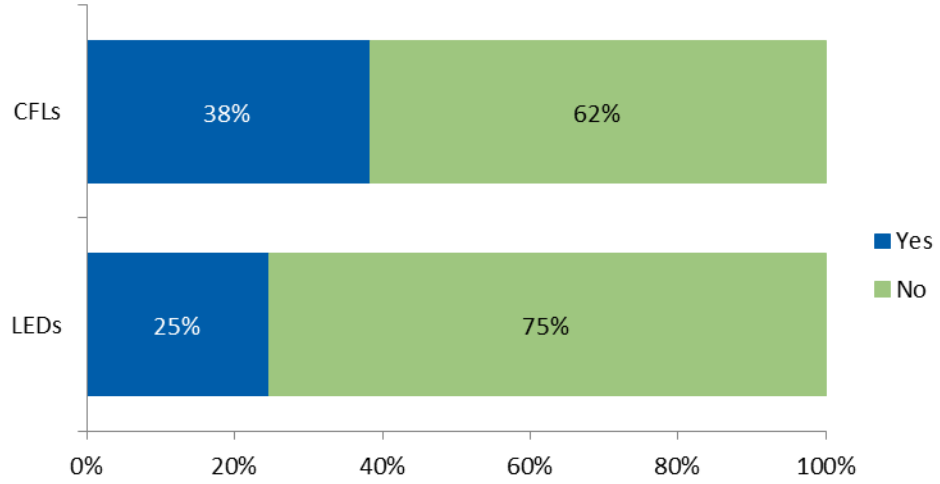
Source: Wisconsin Focus on Energy Residential Lighting and Appliance Program Phone Survey; QA3 and QA4. "Do you have any compact fluorescent light bulbs, also known as CFLs, currently in your home?" and "Are you familiar with compact fluorescent bulbs, or CFLs?" (n≥222)

Over three-quarters of survey participants were familiar with LED bulbs (77%). Among these, 31% reported having LED bulbs currently installed in their home (including holiday lights). This was an increase in awareness from CY 2012, when 72% were aware of LEDs and 24% had LEDs currently installed.

Awareness of Lighting Discounts

In CY 2012, 26% percent of respondents were aware that Focus on Energy had a lighting program through which they could purchase CFLs and LED bulbs at a discounted price. In CY 2013, awareness about discounted CFLs rose to 38%. The CY 2013 survey specifically asked customers about LED bulbs; customer awareness of discounted LED bulbs was 25% (see Figure 39).

Figure 39. Awareness that Focus on Energy Offers Discounted Bulbs at Stores



Source: Wisconsin Focus on Energy Residential Lighting and Appliance Program Phone Survey; QA12 and QA13. "Are you aware that Focus on Energy works with most stores in your area to offer CFLs at discounted prices?" and "Are you aware that Focus on Energy works with most stores in your area to offer LEDs at discounted prices?" (n≥69)

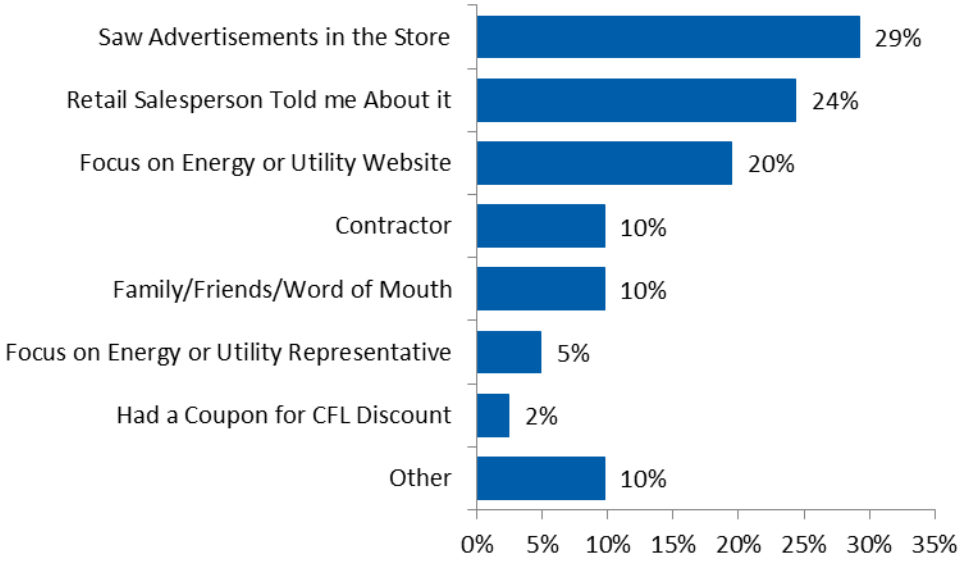
The three sources through which respondents most frequently said they had recently heard about the Focus on Energy Residential Lighting and Appliance Program were store advertisements (27%), conversations with a retail salesperson (22%), and Focus on Energy or their own utility website (18%) (see Figure 40). Several respondents also mentioned recently hearing about the Program from other sources such as a contractor, a friend, a relative, or word-of-mouth; a Focus on Energy or utility representative; or a coupon.

In CY 2012, survey respondents also most frequently (22%) mentioned in-store advertisement as the most common way in which they heard about the Program.

Among the respondents from the lighting phone survey who were aware of Focus on Energy, a little over half (54%) said they were aware of other programs. The most commonly mentioned programs were Home Performance with ENERGY STAR (33%), Residential Lighting and Appliance (21%), and the Appliance Recycling (19%).

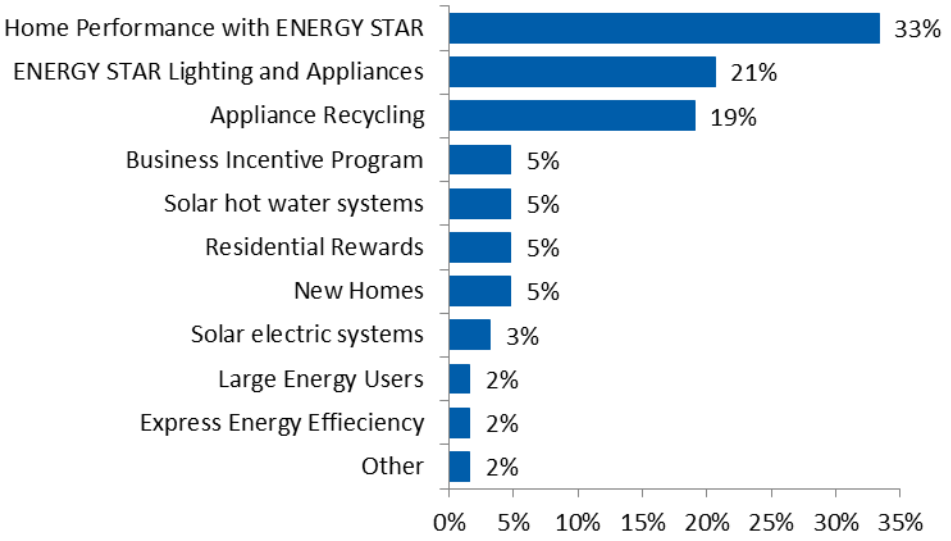
Figure 41 shows the distribution of responses for these and several other programs. When asked whether or not they participated in any of these programs, four respondents said they participated in the Appliance Recycling Program, two said they participated in the Residential Lighting and Appliance Program, and two said the Solar Hot Water Program.

Figure 40. Sources Respondents Most Recently Heard About the Program



Source: Wisconsin Focus on Energy Residential Lighting and Appliance Program Phone Survey; QA14. "Where did you most recently hear about the Focus on Energy Lighting Program?" (n≥88)

Figure 41. Additional Focus on Energy Programs of Which People are Aware



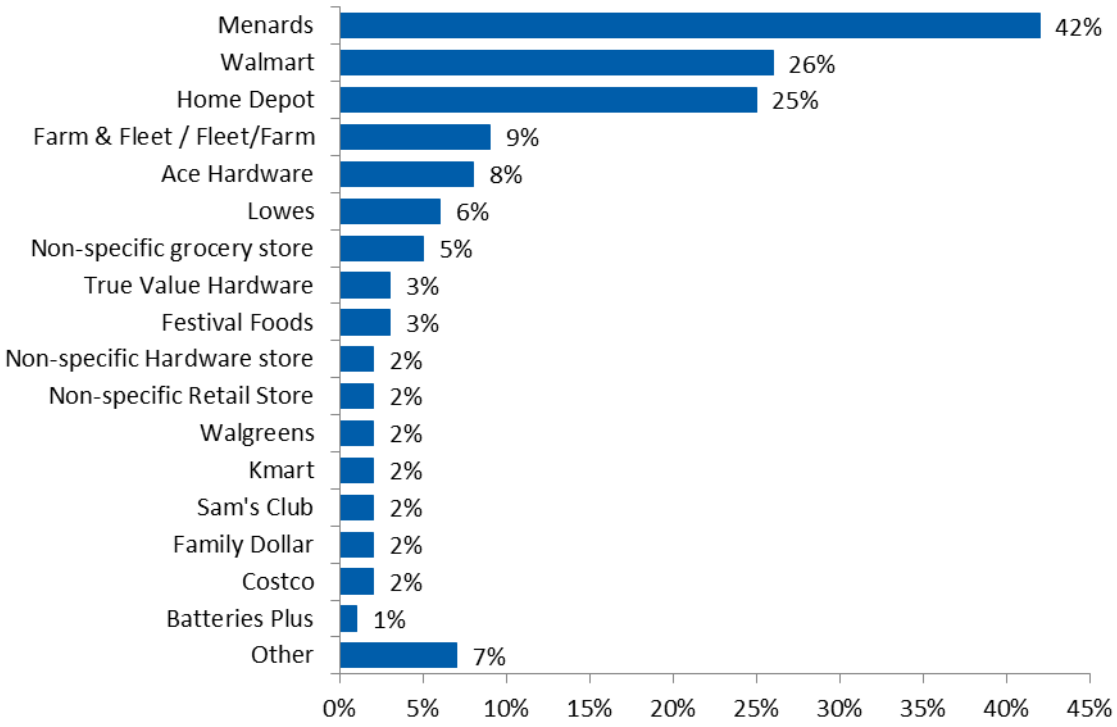
Source: Wisconsin Focus on Energy Residential Lighting and Appliance Program Phone Survey; QA17. "Which programs, rebates, or projects?" (n≥63)

CFL Purchases

Among those familiar with CFLs, the majority of respondents (62%) had purchased them within the last 12 months. Among the 38% who had not purchased a CFL within the last 12 months, 98% reported they have had a CFL installed in their home.

In the last 12 months, according to lighting phone survey, customers purchased the most CFLs at Menards (42%), Walmart (26%), and Home Depot (25%), as shown in Figure 42. The order of these findings closely matched the CY 2012 phone survey. Menards continues to be the most common place where Wisconsin residents purchase CFLs.

Figure 42. Top Selling Stores of CFLs Within the Past 12 Months



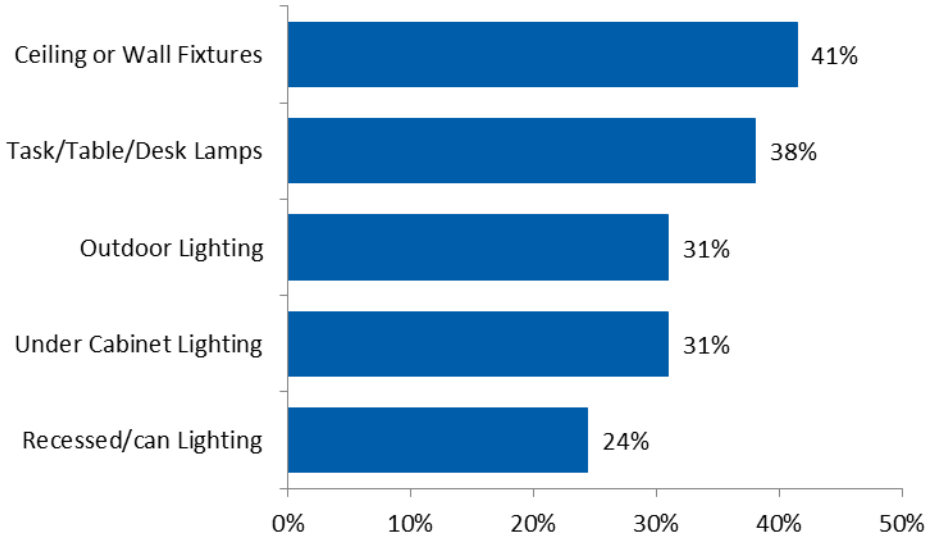
Source: Wisconsin Focus on Energy Residential Lighting and Appliance Program Phone Survey; QB3. "From which stores did you buy the CFLs you purchased in the past 12 months?" (n≥126)

Receptivity to LEDs

Almost one-third (31%) of respondents reported currently having LED bulbs installed in their homes. The most common fixtures in which they had the LED bulbs installed were ceiling or wall fixtures (41%). Respondents also reported task and table or desk lamps (38%), outdoor lighting, under-cabinet lighting, and recessed or can lighting (see Figure 43).

Most (58%) respondents who were familiar with LED bulbs viewed them favorably. Among those who did not, the most frequently cited reason was that they do not like the light quality (38%).

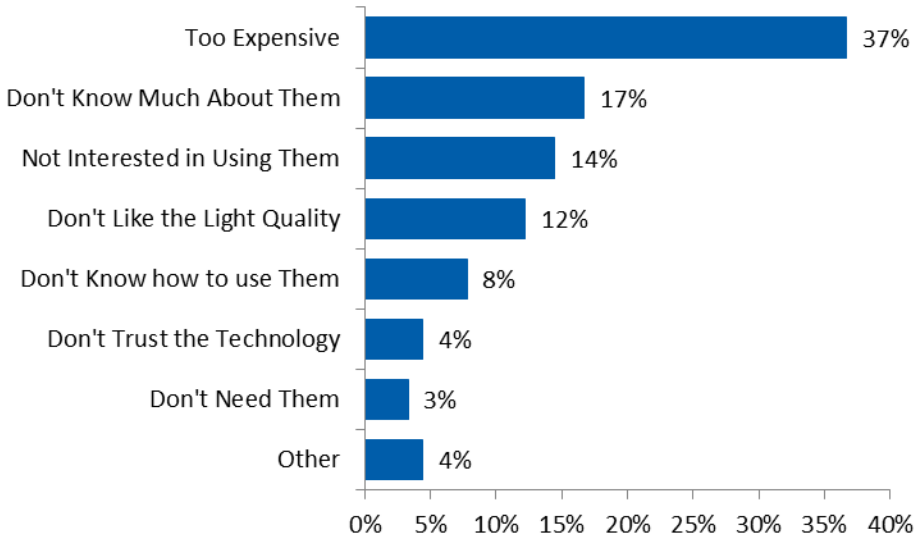
Figure 43. Types of Fixtures in Which Customers Installed LED Bulbs



Source: Wisconsin Focus on Energy Residential Lighting and Appliance Program Phone Survey;
QA11. "Please tell me whether or not you have LED bulbs installed in the following types of fixtures." (n≥42)

Among those who did view LED bulbs favorably, the most common reasons were that respondents like the way they look (38%), LED bulbs save energy (34%), and LED bulbs last a long time (21%). Among those who did not currently have LED bulbs installed in their home, 34% expressed a high level of interest in purchasing and installing LED bulbs, and 25% rated their interest as "non-existent" or "close to non-existent." Respondents reported many barriers to overcome in adopting LED bulbs, including the expense (37%), lack of knowledge (17%), simple disinterest (14%), bad light quality, and lack of knowledge on how to use them (see Figure 44).

Figure 44. Why Respondents' Have Low Interest in Purchasing LED Bulbs



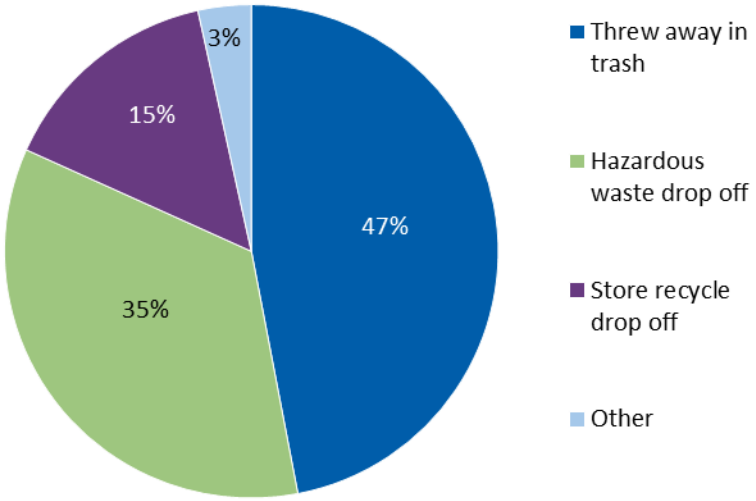
Source: Wisconsin Focus on Energy Residential Lighting and Appliance Program Phone Survey; QD5. "Why would you say your interest is low?" (n≥90)

Disposal of CFLs

Respondents' disposal methods for CFLs have not changed significantly since CY 2012. The CY 2012 survey found that, of those who had disposed of CFLs, 52% threw them away in the trash. The CY 2013 survey found that 47% reported throwing them away. In CY 2012, 48% made sure they recycled their used CFLs, and in CY 2013 50% said they ensured that they recycled used CFLs (see Figure 45).

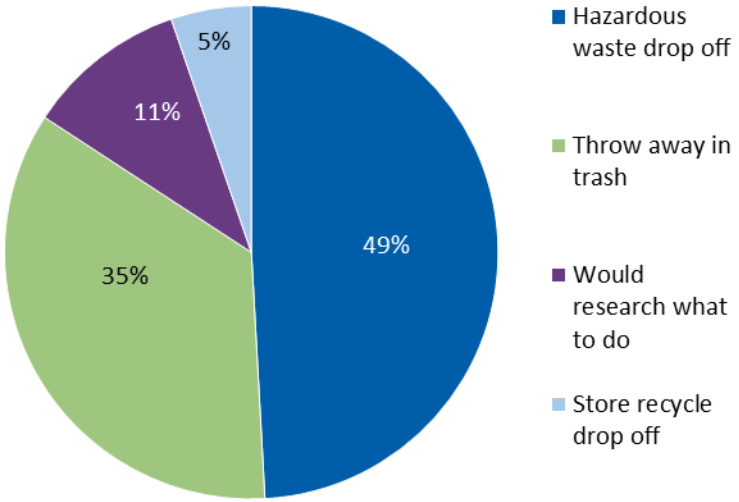
Among CY 2013 respondents who had yet to dispose of CFLs, 35% said they would dispose of them in the trash and 54% said they would drop them off at the appropriate place to be recycled. Additionally, although 11% of respondents were unsure what to do with a used CFL, they said they would research what needed to be done (see Figure 46).

Figure 45. Actions Taken to Dispose of CFLs



Source: Wisconsin Focus on Energy Residential Lighting and Appliance Program Phone Survey; QC2. "How did you dispose of them?" (n≥115)

Figure 46. Actions Considered for Disposing of CFLs



Source: Wisconsin Focus on Energy Residential Lighting and Appliance Program Phone Survey; QC3. "If you were to dispose of a CFL, how would you do so?" (n≥57)

Twenty-one percent of survey respondents were aware that Focus on Energy provides free CFL recycling through participating hardware stores and recycling centers.

Customer Experience

The Program Administrator relied on Program sales as an indicator of customer response—when Program sales are good, the Program Administrator assumed customer response to be positive. The Program Implementer gathered additional information about customer response through its field representatives, who were directly in contact with customers. The Program Implementer noted that the field representatives rarely received negative comments from customers.

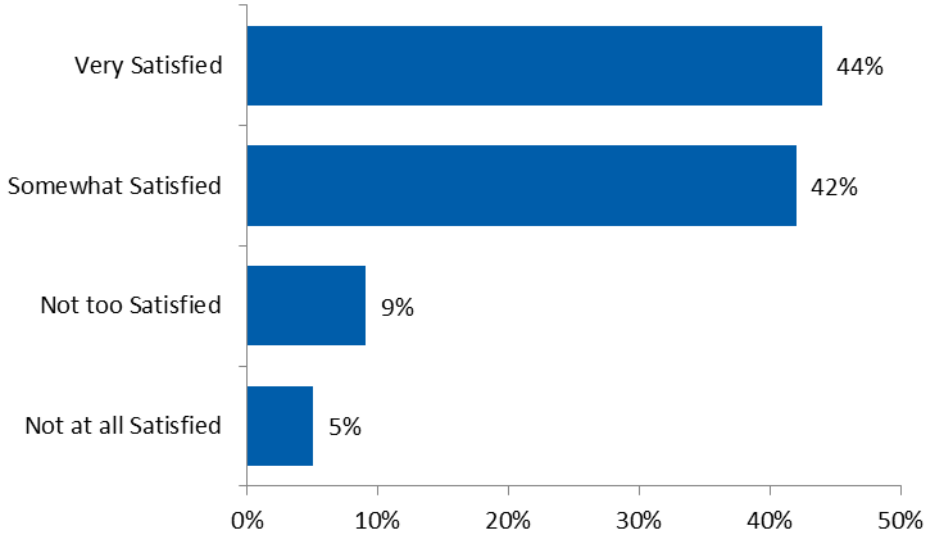
Although there is no formal method for feedback, some representatives said they have heard customers would like more incentives for LED bulbs and clothes washers. Although the Program Administrator may add more LED models to the Program, it is unlikely it will add more clothes washer models. The Program Implementer does not want to offer incentives for clothes washers above the baseline level of efficiency because it could lead to freeridership. Implementer staff said, "The way the clothes washer program is structured, the purchase is an entry level ENERGY STAR unit. But once you get over that initial price point, the majority of clothes washers are ENERGY STAR and that would lead to freeridership."

This conclusion is consistent with data the evaluation team collected for the 2013 Baseline Study based on sales figures disclosed from a panel of retailers. Those data demonstrated that 97% of clothes washers sold were ENERGY STAR rated, and the Evaluation Team's preliminary analysis suggested high levels of freeridership were present at the lower efficiency levels.

Lighting

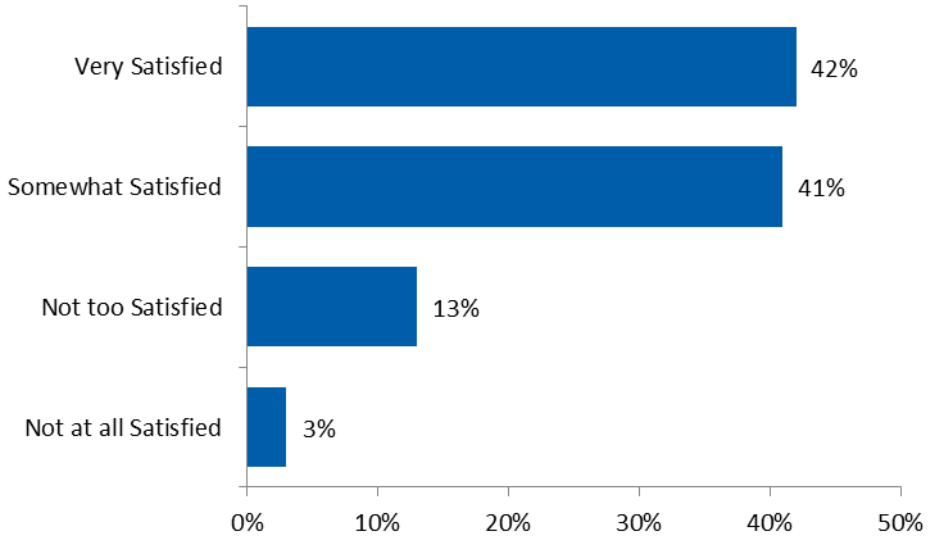
Eighty-six percent of telephone survey respondents said that they were either "very satisfied" or "somewhat satisfied" with CFLs (see Figure 47). Reasons for dissatisfaction included a dislike of the light color (30%) and the delay for the bulb to reach its full brightness (25%). Satisfaction with the price of CFLs increased in CY 2013; 42% of respondents reported they were "very satisfied" (see Figure 48) compared to 34% of the respondents in CY 2012.

Figure 47. Satisfaction with CFLs



Source: Wisconsin Focus on Energy Residential Lighting and Appliance Program Phone Survey;
QB7. "How satisfied are you with the CFLs currently in your home, or, if you have no CFLs installed right now, the ones you have used within the past three years?" (n≥194)

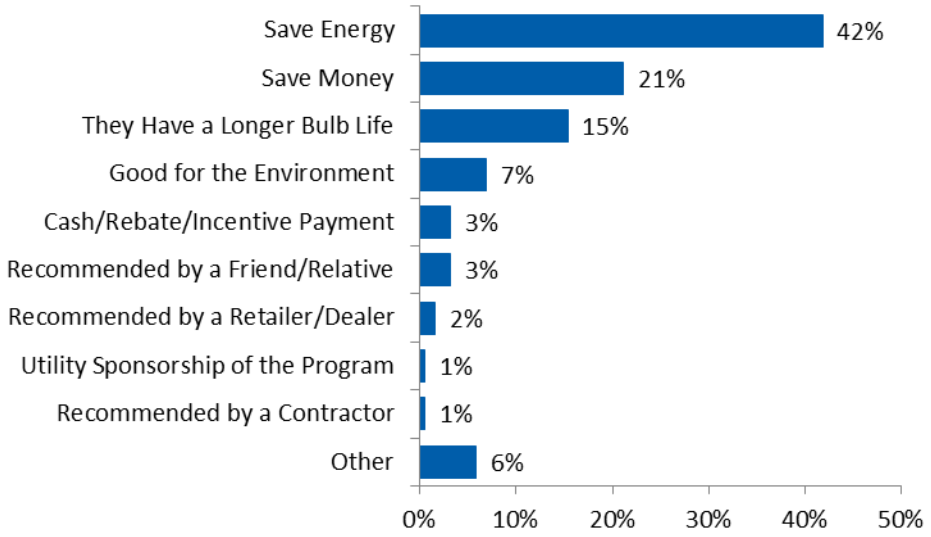
Figure 48. Satisfaction with CFL Price



Source: Wisconsin Focus on Energy Residential Lighting and Appliance Program Phone Survey;
QB9. "How satisfied are you with the price you paid in the last 12 months for CFLs?" (n≥116)

When asked about their motivations to purchase CFLs instead of another bulb type, 42% of respondents said they were motivated by the opportunity to save energy, 21% to save money, 15% said it was because CFLs have a longer bulb life, and 7% of respondents said it was because CFLs are "good for the environment" (see Figure 49).

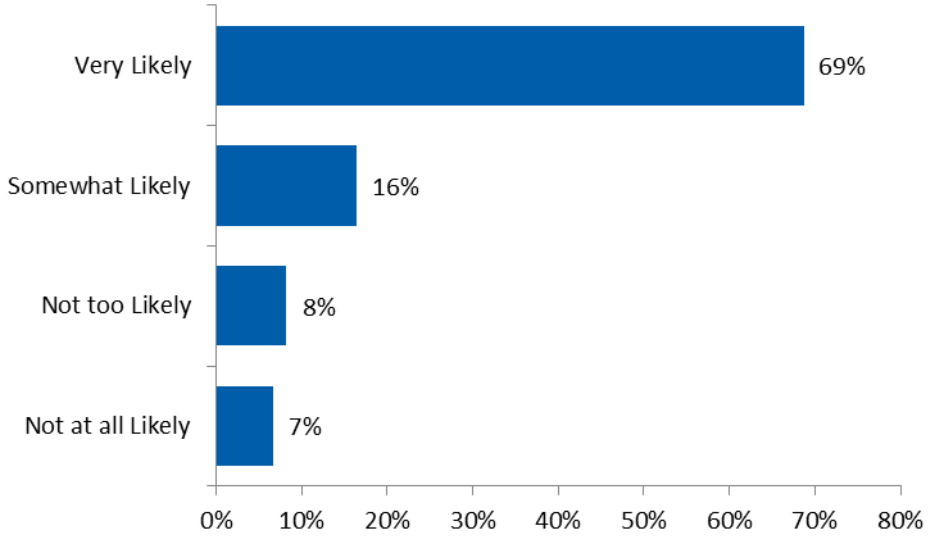
Figure 49. Motivation to Purchase CFLs



Source: Wisconsin Focus on Energy Residential Lighting and Appliance Program Phone Survey; QB10. "What motivated you to purchase CFLs instead of or in addition to incandescent bulbs in your home?" (n≥189)

When asked about the likelihood of replacing a burnt-out CFL with another CFL, 85% of the respondents said they were "very likely" or "somewhat likely" to do so (see Figure 50).

Figure 50. Likelihood of Replacing a Burnt-Out CFL with Another CFL



Source: Wisconsin Focus on Energy Residential Lighting and Appliance Program Phone Survey; QB4. "When a CFL burns out, how likely are you to replace it with a CFL versus a different kind of light bulb?" (n≥195)

Among those who have removed a CFL from inside their home, the most common reason was because the bulb had burned out (60%), followed by the bulb broke (11%). Other reasons included bulbs not being bright enough (9%) and incompatibility with specialty switches (3%).

Clothes Washers

The Evaluation Team interviewed 17 Program participants who purchased a clothes washer. The Evaluation Team confirmed their participation through the program database.

Sixteen respondents who had received clothes washer incentives reported they were satisfied with the Program (one respondent declined to comment). Of these 16 respondents, 88% said they were "very satisfied" and 13% said they were "somewhat satisfied." On a scale of 1 to 10, with 1 being not at all likely and 10 being very likely to recommend the Program to a friend, 82% gave a score of 7 or greater.

Respondents also provided feedback on Program specifics. Among the 17 respondents who participated in the clothes washer phone survey, eight said they were aware that Focus on Energy sponsored the incentive. Of these, seven said they most recently heard about the Program while at the store. Additional information sources respondents cited included television, bill inserts, print media, and word-of-mouth.

Program Cost-Effectiveness

Evaluators commonly use cost-effectiveness tests to compare the benefits and costs of a demand-side management program. The benefit/cost (B/C) test used in Wisconsin is a modified version of the TRC test. Appendix I includes a description of the TRC test.

Table 62 lists the CY 2011-2013 incentive costs for the Residential Lighting and Appliance Program.

Table 62. Residential Lighting and Appliance Program Incentive Costs

	CY 2013	CY 2011-2013
Incentive Costs	$10,060,668	$16,436,568

The Evaluation Team found the CY 2013 Program to be cost-effective (a TRC benefit/cost ratio above 1). Table 63 lists the evaluated costs and benefits.

Table 63. Residential Lighting and Appliance Program Costs and Benefits

Cost and Benefit Category	CY 2013	CY 2012
Costs		
Administration Costs	$1,005,154	$850,403
Delivery Costs	$2,292,199	$1,939,298
Incremental Measure Costs	$20,932,259	$9,652,511
Total Non-Incentive Costs	$24,229,612	$12,442,212
Benefits		
Electric Benefits	$103,518,361	$28,817,743
Gas Benefits	$197,197	$149,807
Emissions Benefits	$44,036,082	$11,918,845
Total TRC Benefits	$147,751,641	$40,886,396
Net TRC Benefits	**$123,522,029**	**$28,444,183**
TRC B/C Ratio	**6.10**	**3.29**

Evaluation Outcomes and Recommendations

The Evaluation Team identified the following outcomes and recommendations to improve the Program.

Outcome 1. Survey responses show strong and growing awareness and willingness to adopt LED bulbs among customers and indicate a market with room to grow, since penetration is low. However, the cost of LEDs is a strong barrier to customer purchase.

Awareness and usage of LEDs has grown in the past year. Seventy-seven percent of survey participants were familiar with LED bulbs, as compared to 72% of CY 2012 respondents last year, and almost a third (31%) reported currently having at least one installed in their homes (up from 24% in the previous year). Just over half (58%) had favorable opinions of LED bulbs and just over a third (34%) of those who do not currently have LED bulbs installed in their homes expressed high interest in purchasing and installing LED

bulbs. The most frequently mentioned unfavorable view and barrier to adoption of LED bulbs is the expense.

Recommendation 1. As the Energy Independence and Security Act of 2007 (EISA) becomes fully implemented and energy-saving claims made on CFLs decrease, the Program Administrator should consider the following recommendations to reduce LED bulb purchase barriers and take advantage of the growing market:

- Offer more incented LED product models—especially those designed for ceiling or wall fixtures, desk lamps, outdoor lighting, and under-cabinet lighting. Customers most commonly requested LED bulbs for these fixtures.
- Because price is a barrier for many customers, increase marketing to include more educational information that emphasizes LED bulbs' light quality, energy savings, and long life may influence purchasing decisions. Also consider creating marketing materials that compare these LED characteristics with other lighting technologies. Materials could involve store signage, bill inserts, and information posted on utilities' or Focus on Energy's websites.

Outcome 2. Customers' lack of awareness and knowledge regarding proper CFL disposal indicates continued room for improvement.

Only half the respondents reported they make sure they recycled their used CFL and, of those who have yet to dispose of CFLs, only 54% said they would drop the bulbs off at the appropriate place to be recycled. While this represents an improvement from the previous year when only 39% of survey respondents reported they recycled their used CFL and 40% of those who said they had yet to do it, said they would, the percentages still indicate room for growth.

Furthermore, only 21% of survey participants were aware that Focus on Energy provides free CFL recycling through participating hardware stores and recycling centers. These numbers are slightly higher than those from other utility territories, but there is still room for improvement in proper disposal.

Recommendation 2. To improve the awareness of proper CFL recycling, consider including information about free CFL recycling in more of the Program's future marketing materials or increase the circulation of existing CFL recycling materials.

Outcome 3. The SPECTRUM database lacks certain capabilities that severely inhibit the Program Implementer from using it as the primary tracking system.

Additionally, the process of inputting invoicing data and updating savings inputs into SPECTRUM causes inefficiencies resulting in out-of-date data and unreliable outputs.

The SPECTRUM database currently lacks the capability to record measure basic attributes (e.g., number of bulbs sold, wattage, pack size, bulb type) that are critical for tracking and planning purposes. The Program Implementer reported they primarily use SPECTRUM for invoicing purposes—that is to allow

payment to partnering manufacturers. Invoicing happens twice a month and involves a complicated approval process, resulting in a 30 to 50 day delay between the date of the invoice and when Implementer staff update data in SPECTRUM. The Evaluation Team had difficulties obtaining savings from SPECTRUM for this evaluation because SPECTRUM's data was outdated.

Recommendation 3. Consider increasing capabilities to track measure attributes that the Program Implementer and Program Administrator agree to be essential for regular tracking purposes or accept the Program Implementer's separate tracking sheet as the main and primary tool for tracking used by both the Program Implementer and Program Administrator.

The Evaluation Team found discrepancies between total reported quantities and total savings within the Program Implementer's separate tracking system. In addition, consider identifying adjustment measures by measure type so SPECTRUM reported savings can be easily disaggregated by measure type.

Also, consider streamlining the process of invoicing and of updating savings inputs into SPECTRUM.

Outcome 4. Just over half (55%) of lamps sold through the Program are 13-watt CFLs.

Starting in January 2014, EISA regulations mandated an end to manufacturing of 40- and 60-watt incandescent bulbs, the latter of which makes up the largest share of incandescent bulbs; the bulbs will be replaced by 13-watt CFLs. The Evaluation Team found during site visits that 44% of installed incandescent bulbs are 60-watt. While this represents a potential increase in sales of 13-watt CFLs as consumers will be forced to find alternative replacements for the 60-watt incandescent, the simultaneous shifting baseline assumption, even with the availability of EISA-compliant halogen bulbs and their associated lower-efficiency baselines, may have notable negative consequences on Program savings.

EISA regulations are about to take their biggest toll on the lighting measures from a savings standpoint. EISA-compliant halogen bulbs aside, EISA will shift the baseline assumptions so that savings for 13-watt CFLs will decrease by about 36% in 2014. If CY 2014 Program sales follow the same distribution as CY 2013 sales, with 13-watt CFLs making up 55% of bulbs sold, Program savings could decrease by as much as 20%.

Recommendation 4. Consider redirecting incentive and marketing resources to encourage greater sales of general LED bulbs and specialty LEDs and CFLs. As mentioned previously, the Evaluation Team found in surveys that, in spite of high prices, Wisconsin customers are aware of and willing to adopt LED bulbs. Additionally, the Evaluation Team found during site-visit audits that energy-efficient lighting (CFLs and LED bulbs) currently comprises only 10% of specialty bulbs.

Phone survey respondents most commonly requested LED bulbs for specialty applications: ceiling or wall fixtures, desk lamps, outdoor lighting, and under-cabinet lighting. While the practicality of using CFLs in some applications have not been widely accepted for aesthetic reasons—for example, candelabra—CFLs

or LEDs in other specialty applications, such as globe, flood, or three-way, are viable options, especially when considering benefits such as longer lifetime.

Outcome 5. Data from the 2013 Baseline Study based on sales figures disclosed from a panel of retailers demonstrated that 97% of clothes washers sold were ENERGY STAR-rated and some preliminary analysis showed high levels of freeridership at the lower efficiency levels.

Recommendation 5. Consider having the Program Implementer and Program Administrator conduct additional analysis given the data provided in the Baseline Study Report regarding clothes washers to determine the extent of freeridership at different efficiency levels. Depending on the results of this savings analysis, consider adjusting the Program's target market (low or high income), exploring tiered or alternative incentive structures, or evaluating the cost-effectiveness of including clothes washers as a measure offered in an upstream program.

Home Performance with ENERGY STAR® Program

In CY 2013, the Home Performance with ENERGY STAR Program was merged with the Assisted Home Performance with ENERGY STAR Program. As part of the same Program, the original Home Performance benefits are labeled Reward Level 1, and the Assisted Home Performance benefits are labeled Reward Level 2. However, for CY 2013, the Evaluation Team evaluated each program separately under its original program name. The Program is delivered through a network of authorized auditors and contractors. The Program Implementer is CSG.

Table 64 provides a summary of the Program's actual spending, savings, participation, and cost-effectiveness from CY 2011 through 2013.

Table 64. Home Performance with ENERGY STAR Program Actuals Summary[1]

Item	Units	CY 2013 Actual Amount	CY 2011-CY 2013 Actual Amount
Incentive Spending	$	$ 3,084,745	$ 6,826,840
Verified Gross Life-Cycle Savings	kWh	34,737,281	68,678,672
	kW	683	1,459
	Therms	7,190,459	29,600,738
Net Annual Savings	kWh	1,826,240	3,156,723
	kW	656	1,220
	Therms	259,921	1,092,536
Participation	Measure Receiving Participants	3,232	10,966
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	1.02	0.44 [2]

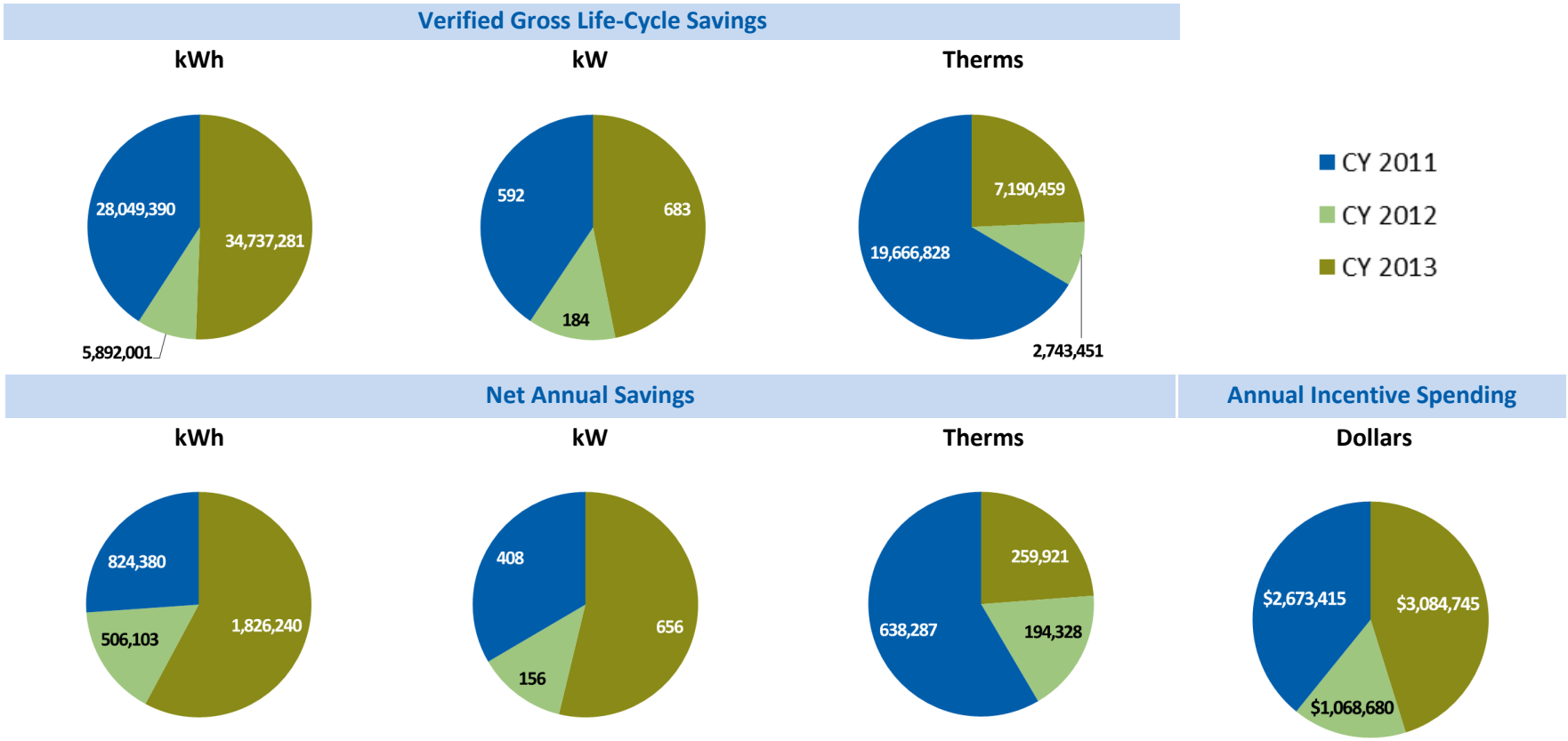
[1] This table presents gross life-cycle savings to allow comparison with Focus on Energy's quadrennial gross life-cycle savings target, and net annual savings to allow assessment of the Program Administrator and Program Implementer's achievement of net annual savings.

[2] The cost-effectiveness ratio is for CY 2012 only.

Figure 51 presents the savings and spending progress made in 2011, 2012, and 2013. The Program met its energy savings goal in CY 2013 and did not exceed budgeted spending. The Program is on track to meet its four-year goals for kWh and kW savings.

A low realization rate for natural gas savings during CY 2013 has put the Program behind track on its four-year gas savings goals.

Figure 51. Home Performance with ENERGY STAR Program Three-Year (2011-2013) Savings and Spending



Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted impact and process evaluations for CY 2013. The Evaluation Team directed the design of its EM&V approach using these key researchable questions:

- What are the gross and net electric and gas savings?
- How can the Program increase its energy and demand savings?
- How has the Program changed since CY 2012?
- How have these changes in Program structure affected Trade Ally participation, process flows, measure selection, savings goals, barriers to participation, and overall functioning?
- Is the Program's marketing strategy effective?
- Are Trade Allies actively and effectively promoting the Program?
- What is the level of customer satisfaction with the Program?
- How can the Program be improved so as to increase the energy and demand savings?
- What are the barriers to expanding customer participation, and how effectively does the Program overcome those barriers?

The Evaluation Team designed its EM&V approach to integrate multiple perspectives in assessing Program performance. Table 65 lists the specific data collection activities and sample sizes used to evaluate the Program.

Table 65. Home Performance with ENERGY STAR Program
CY 2013 Data Collection Activities and Sample Sizes

Activity	CY 2013 Sample Size (n)	CY 2011-2013 Sample Size (n)
Impact		
Program Database Review	Census (3,232 participants)	Census (10,966 participants)
Electric Billing Analysis	184	184
Gas Billing Analysis	265	265
Onsite EM&V	N/A	15
Participant Surveys – Retrofit Customers	72	72
Process		
Program Implementer Interviews	1	3
Program Administrator Interviews	1	3
Materials Review	Census	Census
Participant Surveys – Retrofit Customers	72	72
Participant Surveys – Audit Only Customers	51	51
Participant Trade Ally Interviews	20	20

The Evaluation Team set a target of achieving ±10% precision at 90% confidence for the Home Performance Program's evaluation activities over the four-year period of CY 2011 through CY 2014. For CY 2013, the electric billing analysis achieved ±20% precision, and the gas billing analysis achieved ±11%.

Data Collection Activities

- **Surveys of both retrofit and audit-only participants.** The Evaluation Team conducted 72 surveys with retrofit customers and 51 surveys with audit only customers. Surveys with retrofit customers were used to evaluate process and to determine a net-to-gross ratio for the Program.
- **Interviews with Trade Allies.** The Evaluation Team conducted telephone interviews with 20 Trade Allies who had participated in the Home Performance Program in CY 2013.
- **Collection of electric and gas billing data.** Billing data for participants were provided by the Program Implementer to perform billing analysis and estimate energy savings for measures installed under the Program. The billing analysis was used by the Evaluation Team to establish the verified *ex post* savings of the Program.
- **Interviews of key staff working for the Program Administrator and Implementer.** The Evaluation Team interviewed key staff working for the Program Administrator and for the Program Implementer to discuss Program performance during CY 2013. The interviews focused on changes made to the Program since CY 2012 and addressed conclusions and recommendations from the CY 2012 evaluation.

Impact Evaluation

The Program achieved 3,232 audits and retrofits in 2013, serving 2,124 customers. The impact evaluation consisted of a tracking database review, a billing analysis to verify savings, and a net-to-gross analysis to analyze the overall impact of the Program.

Evaluation of Gross Savings

This section describes how the Evaluation Team assessed gross Program savings.

Tracking Database Review

To calculate total *ex ante* gross savings, the Evaluation Team compiled the electric and gas savings reported in the Program's tracking database. Based on its review of the tracking database, the Evaluation Team calculated *ex ante* gross annual energy savings of 1,390 MWh, 649,832 therms, and reported demand savings of 501 kW.

The Evaluation Team conducted a thorough review of the Program tracking database, verified completeness and quality, and recorded and addressed any discrepancies or omissions during the review process. The Evaluation Team found no missing savings values, no duplication of savings associated with measures installed under the Program, and no duplicate participants.

The SPECTRUM database included 27 "adjustment measures." Two were annual saving adjustments and 25 were adjustments to life-cycle savings. The Program Implementer reported that the life-cycle adjustment measures corrected for an inconsistency in the estimated useful life (EUL) of the "project completion" measure, which, initially, did not list any life-cycle savings. The Program Implementer decided to use an EUL of 25; however, an EUL of 20 was mistakenly applied to instances of project completion before April 11, 2013. The Program Implementer used the life-cycle adjustment measure to correct for this misapplication of the EUL.

As the EUL database approved by the PSC has no EUL for project completion measures,[20] the Evaluation Team calculated an average, weighted by savings, of the EULs of all custom envelope measure types bundled as "project completion." This captures all envelope measures including air sealing and envelope insulation. Because the Program Implementer's database maintains measure-level savings for envelope measures, unlike the SPECTRUM database, this analysis also leveraged the assessment audit data reported in the Program Implementer's database.

For its calculation of *ex post* life-cycle savings, the Evaluation Team calculated an EUL of 23.5 years to all project completion measures with electric savings, and 23.7 years for gas savings. Table 66 lists the weights and approved EUL associated with each envelope measure type.

Table 66. Home Performance with ENERGY STAR Program Project Completion EUL Weighting

Envelope Measure Type	Percentage of Savings (Applied Weight)	Approved EUL
Attic Insulation	40%	25
Wall Insulation	29%	25
Sill-Box Insulation	4%	25
Foundation Insulation	5%	25
Air Sealing	21%	20

One of the two remaining adjustment measures reported an EUL of 25 years. The Evaluation Team deduced it was an adjustment to a project completion measure, so it was given the same EUL as the other project completion measures for the calculation of the *ex post*. The Evaluation Team could not clearly link the last remaining adjustment measure to a particular measure, so passed its life-cycle savings as reported by SPECTRUM through to the *ex post* savings.

In the SPECTRUM database, two project completion measures had an EUL of 250, and another had an EUL of 2.5. The Evaluation Team assumed these were due to errors in data input The Evaluation Team adjusted these EULs in the *ex ante* and *ex post* savings calculations.

[20] Dated April 2013.

The Evaluation Team observed negative electric energy savings reported for 169 participants who installed envelope measures (project completion). These participants reported positive gas and positive electric demand savings, which indicates natural gas was the primary heating fuel. For these participants, a total of -57.57 annual kWh was recorded while the participants saved a total of 84,232 therms for a net savings of 8,421 MMBtu. These negative electric savings may be due to increased cooling load in the spring and fall "shoulder" months.

During shoulder months, the added insulation and air sealing in the home prevents the heat generated by appliances, lighting, and residents from escaping the home, raising the home temperature above the temperate ambient outdoor temperature and thus increasing the amount of the cooling load. To compensate for the increased heat in the home, the cooling system may need to operate more frequently to meet the cooling load. In a few cases in the Program, buffering the conditioned space of a home from the attic through adding envelope insulation contributes to negative cooling savings through increasing attic temperatures, increasing the heat transferred from the attic to the ducts. The reduction in heat transfer from the attic to the conditioned space due to insulation is less than the increase from the attic to the ducts.

Tightening the home may also trigger the operation of the whole-home mechanical ventilation systems and other potential interactive modeling effects, the model result could show negative electric savings.

The Evaluation Team observed 24 participants for whom the tracking database recorded water heater pipe insulation measures that were not on the list of measures defined by the Program. The Evaluation Team suspects that these measures were included to participants as part of a direct install package with uncertain Program boundaries. In any event, the measures were included in the roll-up of savings.

The Evaluation Team noticed there were multiple per-unit deemed savings and EULs assigned to all direct install measures designated "Non PI" (not installed by the Program Implementer) in the tracking database and in the EUL for showerhead and water heater pipe insulation measures. The Evaluation Team understood these changes resulted from requested updates. A requested update is used to adjust the deemed savings value in advance of the Technical Reference Manual (TRM) taking effect. For instance, the EUL for CFLs increased from six years to eight years, while the EULs for showerheads and aerators decreased. The Evaluation Team passed through all of these deemed savings and EULs in its calculation of *ex ante* and *ex post* gross savings.

In the tracking database, the Evaluation Team found that 29% of the Non PI "CFLs – 19 Watt" measure units reported a demand savings value of 0.0005 kW. However, the deemed demand savings associated with the remaining 71% of the measure units was 0.0037 kW. Table 67 shows the different savings found for these Non PI "CFLs – 19 Watt" measures. Given that the low demand savings value was associated with the highest energy savings value, the Evaluation Team thought the demand savings should be at least equal to its lower electric savings counterparts and that this could have been resulted from a data entry error. The Evaluation Team referenced the Focus on Energy work paper for 19W CFLs

measure type in the Program. The work paper indicated that the deemed savings value should be 0.005 kW. The Evaluation Team applied this corrected value to the *ex post* savings.

Table 67. Home Performance with ENERGY STAR Program SPECTRUM Non PI "CFLs – 19 Watt" Savings

kWh Savings	kW Savings
21.32	0.0037
34.38	0.0037
46.52	0.0005 (corrected to 0.005)

Gross and Verified Gross Savings Analysis

The Evaluation Team reviewed the tracking database and applied a realization rate to the *ex ante* electric and gas energy savings based on the billing analysis results. A billing analysis uses regression models to measure the impact of energy-efficiency measures on consumption. By evaluating the pre- and post-installation energy consumption, and accounting for variables such as weather, an impact for an installation can be measured. A billing analysis is a particularly useful method of evaluating building shell measures because their impacts are very difficult to measure from an engineering perspective.

Billing Analysis

The Evaluation Team completed the following steps to conduct the billing analysis:

- Matched the measure data from the tracking database with the electric and gas billing data.
- Used ZIP Code mapping to determine the nearest weather station for each ZIP Code.
- Obtained daily average temperature weather data from January 2011 through September 2013 for 30 National Oceanic and Atmospheric Administration (NOAA) weather stations, representing all ZIP Codes associated with the participants.
- Used daily average temperatures to determine base 45–85 HDDs and CDDs for each station.
- Obtained TMY3 (1991-2005) annual normal and cooling degree days to weather normalize the billing data
- Matched billing data periods with the CDDs and HDDs from the associated stations.

The Evaluation Team chose a fixed pre-installation period for each customer that sufficiently predated installation. The pre-installation period was defined as the earliest available year (April 2011 through March 2012) for all customers; the post-installation period was defined as the one year after the last measure installation.

The Evaluation Team used two different methodologies in its billing analysis: a Conditional Savings Analysis (CSA) fixed-effects modeling approach and PRISM, a modeling tool. For the final results, the Evaluation Team selected the pooled fixed-effects model as this approach yielded the best precision.

PRISM results were used to corroborate the CSA findings. An in depth discussion of the models are presented in Appendix Q.

Data Screening

In order to present a robust study, the Evaluation Team removed the following from the analysis:

- Billing data readings that spanned less than 15 days or more than 65 days
- Electric billing data monthly readings where the usage was less than 1 kWh per day
- Customers with fewer than 10 pre- and 10 post-installation months
- PRISM-based screening steps discussed in Appendix Q.

Table 68 summarizes the electric account attrition from the various screens. There were 1,286 electric accounts receiving major measures in the measure data. Approximately 70% of the attrition was due to inability to match the billing data and insufficient months of billing data. Another 8% were removed because of participation in other programs, and another 8% from PRISM screening, large percentage changes, and individual billing review problems.

Table 68. Home Performance with ENERGY STAR Program Electric Account Attrition

Screen	Participants Remaining	Percent Remaining	Number Dropped	Percent Dropped
Original Electric Accounts	**1,286**	**100%**	**0**	**0%**
Matched to Billing Data Provided	1,127	88%	159	12%
Participated In Other Programs	1,025	80%	102	8%
Less than 10 months of pre- or post-installation period billing data	288	22%	737	57%
Usage/Percent Change Screens + PRISM Screening	262	20%	26	2%
Individual Customer Bill Review: Outliers, vacancies, seasonal usage, and equipment changes	184	14%	78	6%
Final Analysis Group	**184**	**14%**	**1,102**	**86%**

Table 69 lists the gas account attrition from the various screens. There were 1,353 gas accounts receiving major measures in the measure data. Approximately 72% of the attrition was due to inability to match the billing data and insufficient months of billing data. Another 7% were removed because of participation in other programs, and another 1% from PRISM screening, large percent changes, and individual billing review problems.

Table 69. Home Performance with ENERGY STAR Program Gas Account Attrition

Screen	Participants Remaining	Percent Remaining	Number Dropped	Percent Dropped
Original Gas Accounts	**1,353**	**100%**	**0**	**0%**
Matched to Billing Data Provided	1,099	81%	254	19%
Participated In Other Programs	1,001	74%	98	7%
Less than 10 months of pre or post period billing data	288	21%	713	53%
Usage/Percent Change Screens + PRISM Screening	284	21%	4	0%
Individual Customer Bill Review: Outliers, vacancies, seasonal usage, and equipment changes	265	20%	19	1%
Final Analysis Group	**265**	**20%**	**1,088**	**80%**

Electric Energy Savings Summaries

Table 70 presents the electric gross realized savings estimated by the fixed effects model and realization rates and the standard errors around the savings estimates. For additional model details, the model parameters of the overall electric fixed-effects regression model are found in Appendix Q.

Overall the average electric Program participant saved 771 kWh. Compared to the *ex ante* savings estimate of 569 kWh, this represents a 135% realization rate. With an average pre-installation period usage of 9,640 kWh, the savings represent an approximate 8% reduction in usage.

The Evaluation Team also separated the electric pre-installation weather-normalized consumption (PRENAC) usages into four usage quartiles. Savings represent approximately 6% of pre-installation period consumption for the lowest quartiles, increasing up to 9.4% for the highest quartile.

The *ex ante*, expected consumption savings as a percent of pre-installation period consumption, were as high as 12% for the first quartile (that is, lowest pre-installation period consumption) down to the 4% for the highest quartile. Thus, the realized savings were low for the lowest quartile group, at only 55% of claimed savings, whereas for the highest consumption quartile, realized savings were 227% of claimed savings.

Table 70. Home Performance with ENERGY STAR
Evaluated Electric Energy Savings from Billing Analysis

Group	*Ex Post* Model Savings (kWh)	*Ex Ante* Savings per Participant	Realization Rate	PRENAC	*Ex Post* Percent Savings	*Ex Ante* Expected Percent Savings
Quartile 1	277	505	55%	4,325	6.4%	11.7%
Quartile 2	491	558	88%	7,557	6.5%	7.4%
Quartile 3	802	531	151%	10,222	7.9%	5.2%
Quartile 4	1,544	681	227%	16,454	9.4%	4.1%
Overall	**771**	**569**	**135%**	**9,640**	**8.0%**	**5.9%**

Gas Energy Savings Summaries

Table 71 presents the gas fixed-effects gross realized savings estimated by the model and realization rates and the standard errors around the savings estimates. For additional model details, the model parameters of the overall gas fixed-effects regression model are found in Appendix Q.

Overall, the average gas Program participant saved 132 therms. Compared to the *ex ante* savings of estimate of 316 therms, this represents a 42% realization rate. With an average pre-installation period usage of 905 therms, the savings represent approximately 15% reduction in usage.

The Evaluation Team also separated the gas PRENAC usages into four quartiles. As expected, the per-participant model savings and the percent savings both generally increased by quartile. Savings represent approximately 11% to 13% of pre-installation period consumption for the lowest quartiles, increasing up to 16% for the highest quartile. The *ex ante* expected consumption savings as a percent of pre-installation period consumption were as high as 47% for the first and second quartiles (that is, the lowest pre-installation period consumption and the next lowest quartile) and down to 23% for the highest quartile. Thus, the realized savings were very low for the lowest quartile group, at only 23% of claimed savings, whereas for the highest consumption quartile, realized savings were 67% of claimed savings.

Table 71. Home Performance with ENERGY STAR Evaluated Gas Energy Savings from Billing Analysis

Group	*Ex Post* Model Savings (kWh)	*Ex Ante* Savings per Participant	Realization Rate	PRENAC	*Ex Post* Percent Savings	*Ex Ante* Expected Percent Savings
Quartile 1	53	234	23%	505	10.6%	46.4%
Quartile 2	96	340	28%	719	13.3%	47.3%
Quartile 3	150	345	43%	918	16.3%	37.6%
Quartile 4	232	345	67%	1485	15.6%	23.2%
Overall	**132**	**316**	**42%**	**905**	**14.6%**	**34.9%**

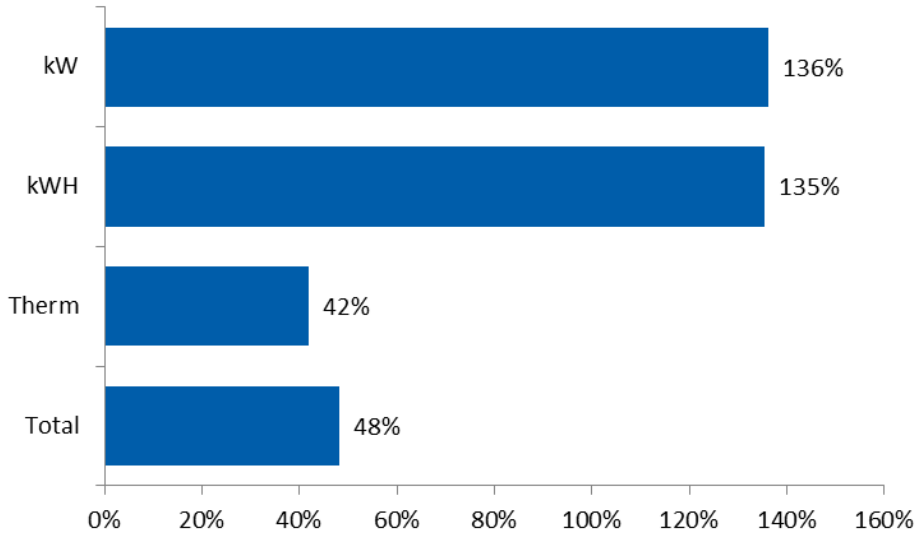
Realization Rates

Using the billing analysis, a realization rate of 135% was determined for electric energy savings and a realization rate of 42% for natural gas savings. Since the majority of the Program's savings were of the natural gas component, the weighted average of the electric and gas realization rates is 48%. Therefore, in accordance with the Program operating criteria and the previously agreed upon evaluation criteria, the gross savings reported in the Program tracking database have not been achieved.

The realization rates indicate that the reported (*ex ante)* values overestimated gas savings while they underestimated electric savings. One potential cause for the discrepancy lies in the fact that *ex ante* savings did not appear to be strongly dependent on the energy usage of the residence at the time of the installation. More reliable savings estimates can be obtained if the *ex ante* savings estimates can be calibrated to actual pre-installation period billing data or potentially the size and occupancy of the residence. This would improve the reliability of the Program's tracking data.

Figure 52 shows the realization rate by fuel type.

Figure 52. Home Performance with ENERGY STAR Program Realization Rate by Fuel Type



Gross and Verified Gross Savings Results

Applying the realization rates from the billing analysis to the gross savings from the tracking database review, The Evaluation team developed the evaluated savings for the Program. Table 72 presents the total and evaluated gross savings, by measure type, achieved by the Program in 2013.

Table 72. Home Performance with ENERGY STAR Program Gross Savings Summary

Measure Type	Gross			Verified Gross		
	kWh	kW	Therms	kWh	kW	Therms
Lighting – CFLs	438,701	47	0	594,184	68	0
Building Shell – Project Completion	898,711	454	635,811	1,217,228	615	265,737
Domestic Hot Water – Faucet Aerator	13,349	0	4,742	18,081	0	1,982
Domestic Hot Water – Efficient Showerheads	35,806	0	9,217	48,496	0	3,852
Domestic Hot Water – Water Heater Pipe Insulation	1,335	0	102	1,809	0	43
Adjustment Measure	2,040	0	-40	2,763	0	-17
Total Annual	**1,389,943**	**501**	**649,832**	**1,882,561**	**683**	**271,597**
Lighting – CFLs	2,997,571	47	0	4,059,957	68	0
Building Shell – Project Completion	21,147,012	454	15,062,917	28,641,845	615	6,295,531
Domestic Hot Water – Faucet Aerator	106,794	0	36,877	144,644	0	15,413
Domestic Hot Water – Efficient Showerheads	429,673	0	110,604	581,955	0	46,227
Domestic Hot Water – Water Heater Pipe Insulation	16,026	0	1,226	21,705	0	512
Adjustment Measure	1,287,175	0	832,776	1,287,175	0	832,776
Total Life-Cycle	**25,984,249**	**501**	**16,044,400**	**34,737,281**	**683**	**7,190,459**

Evaluation of Net Savings

The Evaluation Team assigned a net-to-gross ratio of 1.0 to all direct install measures. Directly installed measures are assumed to be provided to customers that were unlikely to purchase the measures on their own in the near future. For estimating the net-to-gross ratio associated with the insulation measure types, the Evaluation Team analyzed the data collected during the participants' phone surveys. Further details on the analysis methods are discussed in Appendix L.

Net-to-Gross Analysis

Net-to-Gross Ratio

In order to calculate the net-to-gross ratio for the project completion measure, the Evaluation Team looked at the three major components of envelope measure savings through the Program. Using the Program Implementer's database, the Evaluation Team found that over 90% of the project completion savings came from attic insulation, wall insulation, or air sealing measures.

The net-to-gross estimate results for the three primary measures were then weighted by Program savings in order to determine a weighted average ratio for the project completion measure. Table 73 shows the weighting by project completion savings percentage to calculate the overall net-to-gross ratio for the project completion measure. The net-to-gross ratio for the air sealing measure is assumed to be one given the difficulty a person has in independently evaluating the need for an upgrade.

Table 74 shows the net-to-gross ratio estimates by measure type and overall, including spillover, which the Evaluation Team estimated based on participant surveys. The overall Program's net-to-gross percentage equals 95.4% and is the weighted average based on energy saving (MMBtus).

Table 73. Project Completion Net-to-Gross

Measure	% Project Completion Savings	Net-to-Gross
Attic Insulation	40%	93.6%
Wall Insulation	29%	93.6%
Air Sealing	21%	100%
Building Shell – Project Completion	**90%**	**95%**

Table 74. CY 2013 Home Performance with ENERGY STAR Program Freeridership, Spillover, and Net-to-Gross Estimates by Measure Type

Measure Type	Freeridership	Spillover	Net-to-Gross
Lighting – CFLs	0%	0%	100%
Building Shell – Project Completion	4.7%	0.3%	96%
Domestic Hot Water – Faucet Aerator (Kitchen)	0%	0%	100%
Domestic Hot Water – Faucet Aerator (Bathroom)	0%	0%	100%
Domestic Hot Water – Efficient Showerheads	0%	0%	100%
Domestic Hot Water – Water Heater Pipe Insulation	0%	0%	100%
Overall[1]			**95.6%**

[1] The overall value is weighted by the distribution of evaluated gross energy savings for the Program population.

Net Savings Results

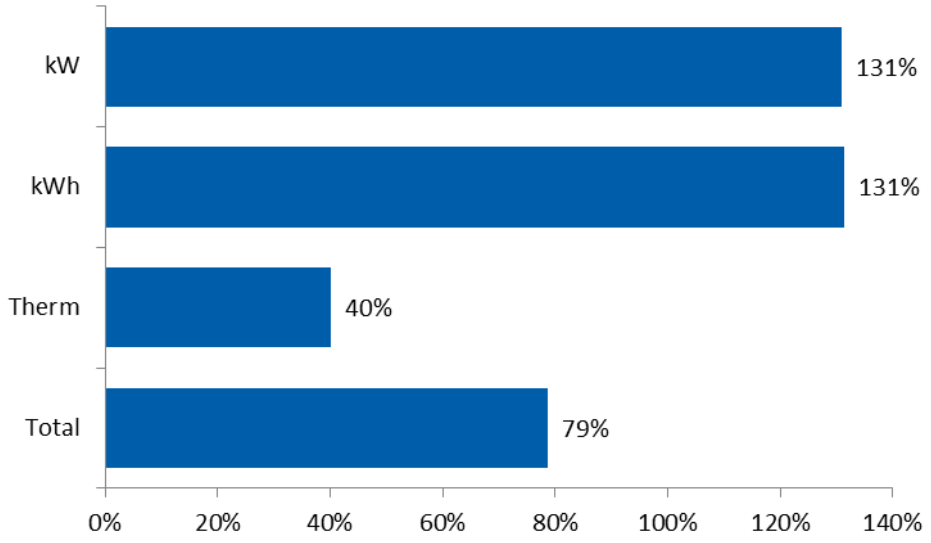
Table 75 shows the net energy impacts (kWh, kW, and therms) for the Program. The Evaluation Team attributed these net savings to reflect an estimate of what would have occurred without the Program. The one adjustment measure directly associated with the project completion measure was assigned the same net-to-gross as the project completion measure.

Table 75. Home Performance with ENERGY STAR Program Net Savings

Measure Type	Verified Net		
	kWh	kW	Therms
Total Annual	**1,826,240**	**656**	**259,921**
Total Life-Cycle	**33,420,404**	**656**	**6,876,813**

Figure 53 shows the net savings as a percentage of the *ex ante* gross savings by fuel type.

Figure 53. Home Performance with ENERGY STAR Program Net Savings as a Percentage of *Ex Ante* Savings by Fuel Type



Process Evaluation

For the CY 2013 process evaluation, the Evaluation Team:

- Interviewed the Program Administrator and Program Implementer staff
- Surveyed 70 retrofit customers and 51 audit-only customers
- Interviewed 20 Trade Allies

The survey activities, sampling precision, and sample sizes are listed above in Table 20.

The Evaluation Team used these data to evaluate Program changes since CY 2012, with a particular focus on issues and recommendations presented in the CY 2012 evaluation report. These recommendations are:

- Continue to integrate the Assisted Home Performance with ENERGY STAR Program with the Home Performance with ENERGY STAR Program.
- Increase communication and outreach with Trade Allies and offer more targeted training on the Program Implementer's new proprietary software EnergyMeasure® HOME (EM HOME) and other technical topics.
- Develop templates for marketing materials so Trade Allies can add their contact information and distribute these materials in their local areas.

Program Design, History, and Goals

Program History

The Program has been offered in Wisconsin since 2001. Prior to 2012, the Program had been organized as Implementer-centric, where the Program Implementer guided the customer through the steps from audit to retrofit. In CY 2012, the Program adopted a contractor-driven model in which (1) the customer needed to work with only one Trade Ally throughout the entire process, and (2) the Program Implementer conducted periodic quality assurance checks on the installation and the test-out procedure in order to verify project savings.

Program Design

The Program is designed to encourage homeowners to make energy-efficiency upgrades, and it helps overcome barriers related to cost and lack of information by offering homeowners cash incentives and an audit report. There were no major changes in Program design for CY 2013 from the previous year, other than how the Program was presented to the public.

As in CY 2012, participants received incentive payments of 33%, up to $1,500, of the cost of air sealing and insulation improvements. No other upgrade measures are eligible. Participants who achieved household energy consumption savings of 15% compared to pre-installation levels were eligible to receive a $200 savings bonus. Those who achieved savings of 25% or better were eligible to receive a $700 savings bonus.

To determine the savings bonus level, Trade Allies were required to use a post-installation verification test. This verification test also provides participants with added peace of mind since it shows how well the air sealing and insulation work, and it motivates contractors to achieve maximum energy savings.

The Program Implementer made two observations about the current Program design. First, it was noted that more CY 2013 projects were closer to the maximum rebate than in CY 2012. (The average measure incentive per retrofit customer was $1,259 for CY 2013.) Second, the Program's limited measure offerings may restrict the size of projects completed through the Program, and that if more measures were included, projects could become even more comprehensive.

The Program has a whole-home focus and requires Trade Allies to run modelling software that identifies a variety of cost-effective upgrades, such as insulation, air sealing, HVAC upgrades, and duct sealing. However, the only major retrofit measures for which the Program provides incentives are building shell measures. Because most participating Trade Allies specialize in building shell work, they must refer a customer to another contractor for any measures other than air sealing or insulation. The Program Implementer thought Trade Allies may have been reluctant to make a referral for other measures and customers may have been reluctant to use a contractor they do not know.

In CY 2013, the Program was presented to the public differently from CY 2012. To reduce customer confusion, the Program Implementer began presenting the Home Performance with ENERGY STAR

Program and the Assisted Home Performance with ENERGY STAR Program as one program with two reward levels. Reward Level 1 corresponds to the standard Home Performance Program, and Reward Level 2 corresponds to the Assisted Home Performance Program. This chapter addresses only the Home Performance Program (Reward Level 1); the following chapter addresses the Assisted Home Performance Program.

Program Goals

The Program fell slightly short of its participation goal for the year, but initially showed gross savings results very close to incremental goals for the year. However, due to the low realization rate for natural gas, the program nearly met its kWh target but fell short of its therms target.

The Program Administrator and Implementer also use several key performance indicators (KPIs) to judge Program performance more broadly. KPIs include number of measures per project, savings per project, and direct install material distribution, among others.

At the end of the year, the Program had installed more major measures per project and achieved higher *ex ante* therms savings than the Program Implementer had projected. However, the rate of distribution for direct install measures was lower than projected. Overall the major measure savings outweighed the shortfall in direct install savings.

The Evaluation Team asked Trade Allies what percentage of their customers received direct install materials. Answers varied widely, from 90% of customers who did not want or need them to 100% of customers who accepted at least some materials. Six Trade Allies said 50% or more of their customers rejected some materials. Five Trade Allies said between 10% and 50% of their customers did not want or did not need any materials. Eight Trade Allies did not provide an estimate.

Program Management and Delivery

This section addresses aspects of the Program related to management structure and staffing, Program delivery, and data capture and transfer issues.

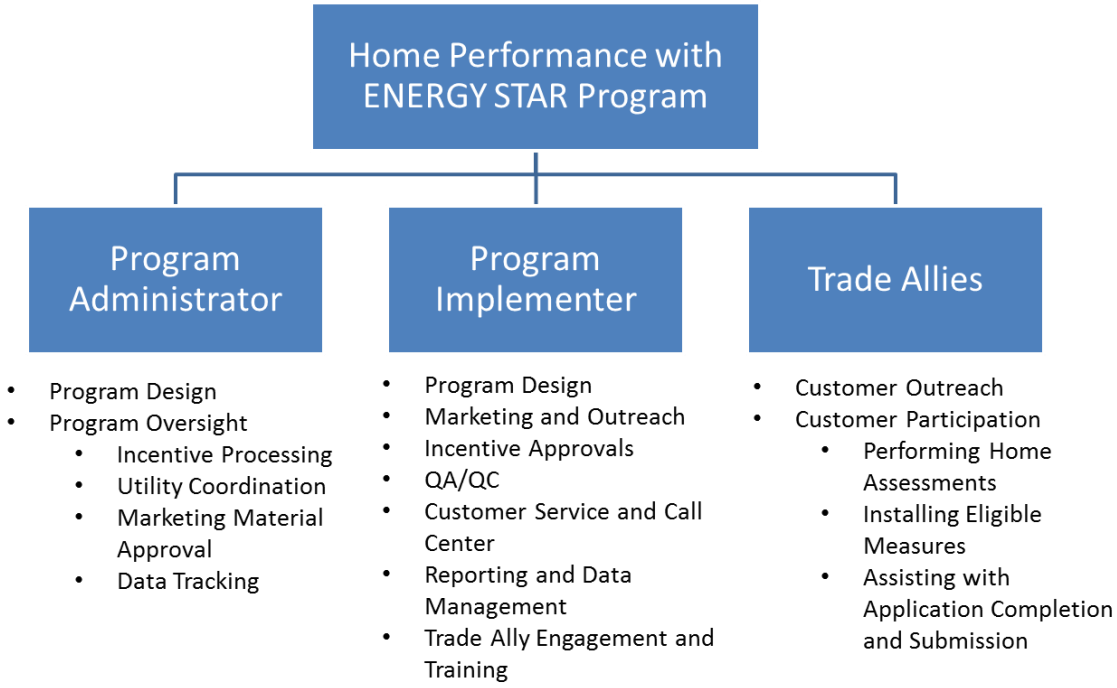
Management and Delivery Structure

In CY 2013, the Program Administrator consolidated management at the portfolio level and replaced the Program Lead. The Program Implementer did not make any changes in its management structure or staffing for CY 2013.

The Program continues to be delivered primarily through the Trade Ally network. Trade allies promote the Program both to their regular customers and in their marketing to attract new customers. The Program Implementer has four regional coordinators around the state who assist Trade Allies.

Figure 54 shows a diagram of the key Program actors for the Home Performance with ENERGY STAR Program.

Figure 54. Home Performance with ENERGY STAR Program Key Program Actors and Roles



Program Data Management and Reporting

The Program had some minor data management issues in CY 2013. Trade Allies completed home audits using the Program Implementer's proprietary EM HOME software and submitted reports to the Program Implementer to upload to SPECTRUM. The Program Administrator reported that both Program Administrator and Program Implementer staff found uploading and downloading reports in SPECTRUM was extremely time-consuming. The Program Implementer has been documenting when the system is extremely slow.

The Program Implementer introduced EM HOME software when it began its contract in CY 2012. Trade Allies' reaction to the software remained mixed during CY 2013. Four Trade Allies stated they did not use the software but hired independent consultants to use it for them. Twelve of the sixteen Trade Allies who reported using the EM HOME software said it needed improvement. Their most consistent complaint was that the software was too slow and took too much of their time. Other complaints were that it was "cumbersome" and "not user-friendly." Three Trade Allies said they had "no problems" with EM HOME and one Trade Ally said he liked it.

Marketing and Outreach

The Program relies on Trade Allies for marketing. The Program helps Trade Allies produce promotional materials through a co-op marketing system that will reimburse up to 50% for the cost of qualifying marketing materials. The maximum reimbursement per Trade Ally is $4,000 per year, an increase of $1,000 over the previous year. The cap is tiered according to the Trade Ally's participation; those who complete more jobs have access to more financial assistance.

Of 20 Trade Allies interviewed, nine reported they participate in the co-op marketing system, and two of these noted that the paperwork was extremely time-consuming. One was not aware the system existed.

The Program requires Trade Allies to cross-market other Focus on Energy Programs, particularly the Residential Rewards and Enhanced Rewards Programs. The Program Administrator noted that cross-promotion was a medium priority in CY 2013 but is becoming a higher priority for the Program. Currently, the Program Implementer assists with cross-promotion by producing a promotional flyer to be inserted in the bonus checks mailed to customers.

However, because the Program uses an instant-rebate method for individual measures, the majority of checks are sent directly to Trade Allies, and not all participants receive this cross-promotional material.

In interviews, Trade Allies stated that they promoted the Focus on Energy programs listed in Table 76. Several qualified their statement by saying "most of the time" or "sometimes." For some programs, Trade Allies indicated they promote only part of it. For example, two reported they promote only the attic insulation portion of the Residential Rewards Program.

Table 76. Trade Allies Self-Reported Cross-Promotion of Focus on Energy Programs

Programs	No. of Mentions
Residential Rewards/Enhanced Rewards	8
None	4
Appliance Recycling	3
"Commercial programs"	2
Low-Income Weatherization	2
New Homes	2
Renewable Rewards	2
Express Energy Efficiency	1

Source: Trade Ally Interview, Question 29: "Do you mention any other Focus on Energy Programs to customers?" (n=20; multiple responses included)

When asked if they were aware of other programs, about two-thirds of retrofit (62%, n=72) and audit-only (67%, n=51) participants surveyed said they were not. The Evaluation Team reviewed the Program database to determine the extent to which its participants also participated in Residential Rewards or Enhanced Rewards. Table 77 shows the results.

Table 77. Customers Participating in Both Home Performance with ENERGY STAR and Residential Rewards or Enhanced Rewards

	Residential Rewards	Enhanced Rewards
Participants	157	7
Percent of Home Performance Program Participation	4.9%	0.2%

Source: Program database, (n≥ 3,232)

Customer Experience

The Evaluation Team conducted 72 surveys with customers who completed a retrofit (retrofit customers) as well as 51 surveys with customers who completed an audit but did not move forward with any Program upgrades (audit-only customers). The survey collected information on how customers learned about the Program, why they participated, details on their Program experience, and demographic information.

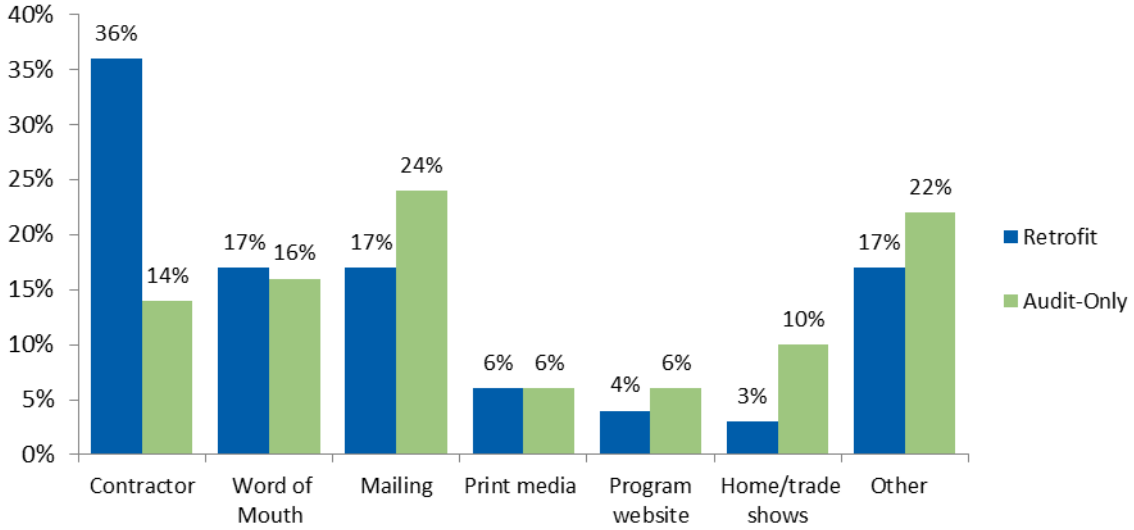
Sources of Information

Retrofit and audit-only customers showed notable differences in how they entered the Program, according to survey data. The most common source of information for a retrofit customer was through a contractor; 36% of retrofit customers most recently heard about the Program through their contractor. Word-of-mouth (17%) and mailings (10%) were the second and third most common unique sources of information.

Audit-only customers were likely to have most recently heard about the Program through a mailing (24%), word of mouth (16%) or a contractor (14%). 22% of audit-only customers mentioned other sources including community events, radio, television (though the program did not air TV ads), other websites, realtors, and other sources, though the proportion mentioning each unique source in the "other" category was below 3%.

Figure 55 shows the sources of information for both retrofit and audit-only customers.

Figure 55. Customer-Reported Sources for Information about the Program



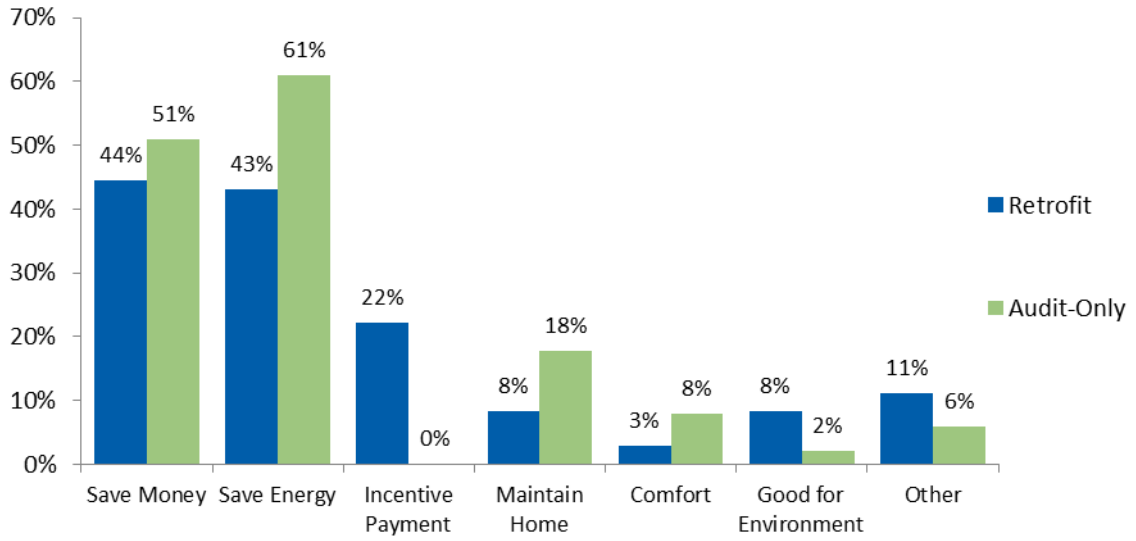
Source: Participant Survey and Participant Survey – Audit-Only Participants, Question C1: "Where did you most recently hear about the Focus on Energy Home Performance with ENERGY STAR Program?" (n≥49)

Decision Influences

The Evaluation Team asked survey respondents what influenced their participation and what made retrofit customers decide to proceed with upgrades. When asked why they chose to have a home assessment, customers offered a wide range of reasons. The most frequent responses were that they wanted to save money or save energy. Forty-four percent (n=72) of retrofit customers wanted to save money and 43% wanted to save energy, while 51% (n=51) of audit-only customers wanted to save money and 61% wanted to save energy (some customers may have given more than one response).

Twenty-two percent of retrofit customers also were interested in taking advantage of available rebates. The third most common motivator for audit-only customers was to maintain or learn about their home (18%). Motivating factors are shown in Figure 56.

Figure 56. Motivation Factors for Having a Home Assessment



Source: Participant Survey and Participant Survey – Audit-Only Participants, Question D1: "What were the most important reasons you decided to have a home energy assessment?" (n≥51)

Eighty-nine percent (n=71) of retrofit customers reported receiving a written assessment report. Of these, 81% (n= 62) said the assessment results were very important in their decision to move forward with a retrofit. Ninety-eight percent of customers (n=72) felt the Trade Ally was very helpful or somewhat helpful in understanding the assessment report. Eight-six percent (n=69) reported the Trade Ally mentioned available incentives.

The assessment report appears also to have been useful to audit-only respondents; 98% of this group (n=51) received a written report. Of these, 57% (n=49) reported that the report was very helpful for them to understand their home energy use, and 33% (n=49) said it was somewhat helpful. When asked if the Trade Ally helped them understand the report, 69% of audit-only respondents (n=51) said the Trade Ally was very helpful, and 22% (n=51) said somewhat helpful. Seventy-eight percent (n=45) reported that the Trade Ally discussed available incentives.

Twenty-four percent of audit-only respondents (n=50) said they had implemented some of the audit report recommendations without receiving a rebate; Table 78 lists these recommended measures. Of these respondents, two indicated they planned to get the rebate, but the remainder had other reasons for not going through the Program, as Table 79 shows.

Table 78. Measures Installed by Audit-Only Respondents without a Rebate[1]

Measure Installed	No. of Responses
Roof or attic insulation	7
Air sealing	4
Wall insulation	2
Sill box insulation	3
Bathroom fan	2
Foundation insulation	2
CFLs	2
New furnace	1
Overhang insulation	1

[1] Measures that are eligible for inclusion in spillover are also reflected in spillover savings.

Source: Participant Survey – Audit-Only Participants,
Question E2: "What recommended upgrades have you installed?" (n=12; multiple responses included)

Table 79. Why did you not apply for a rebate?

Measure Installed	No. of Responses
Thought I was not eligible	3
Contractor's bid too expensive	3
Plan to apply/Haven't received rebate yet	2
Didn't know how to apply	2
Only received CFLs, they were free	1
Rebate not meaningful amount	1

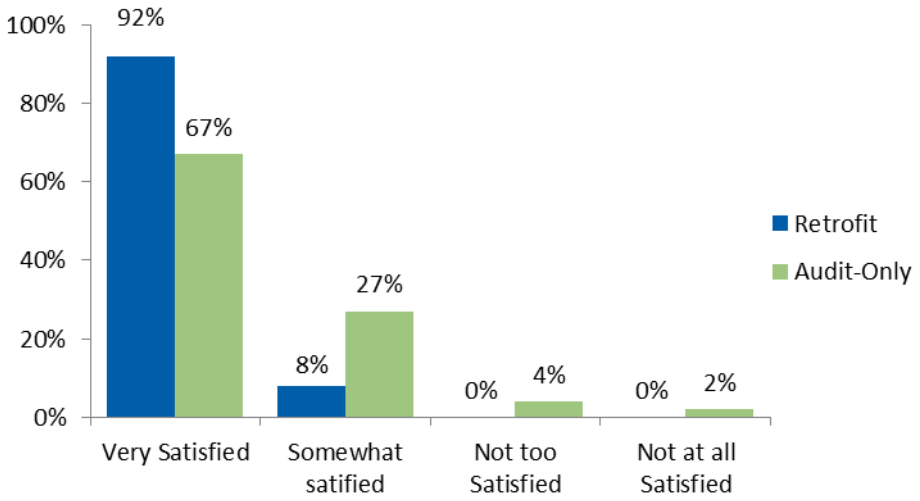
Source: Participant Survey – Audit-Only Participants,
Question E3: "Why did you not apply for the Program rebate?" (n=12)

Customer Satisfaction

The Evaluation Team asked several questions about customers' satisfaction with various aspects of the Program. As Figure 57 shows, both retrofit and audit-only customers were largely satisfied with the home assessment they received. Retrofit customers were more likely to be very satisfied than audit-only customers.

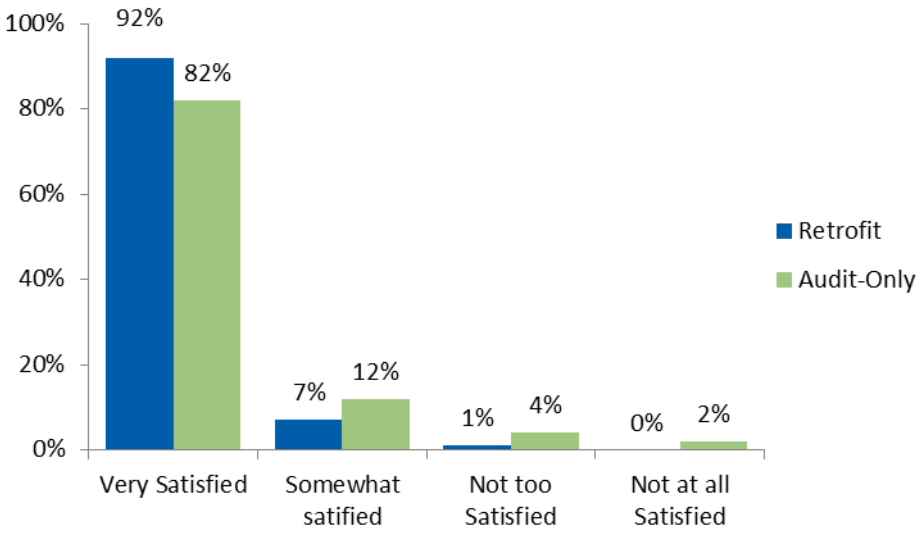
Both sets of customers also were satisfied overall with their Trade Ally, as Figure 58 shows. Both retrofit and audit-only customers also showed high levels of satisfaction with the Program overall; as was true for the home energy assessment, audit-only customers were more likely to be somewhat satisfied than the retrofit customers (Figure 57).

Figure 57. Customer Satisfaction with the Quality of the Home Energy Assessment



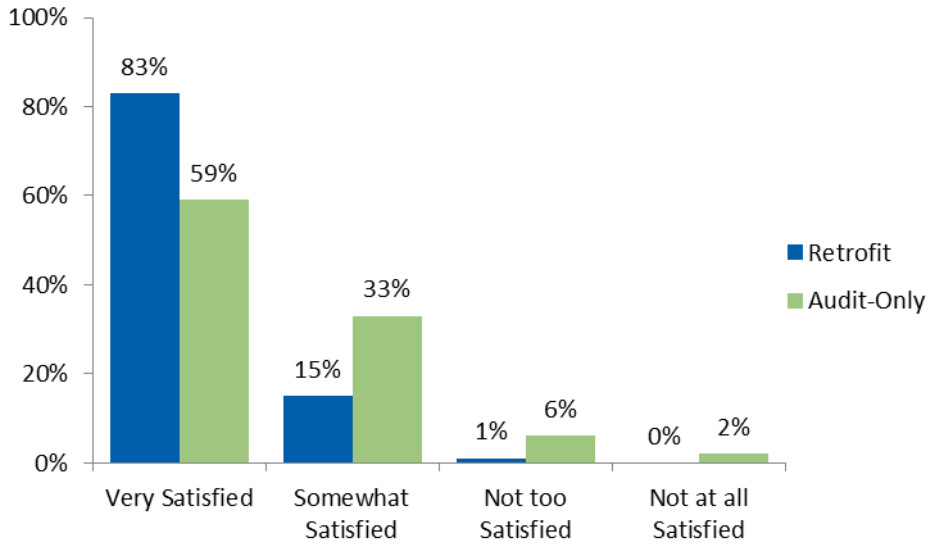
Source: Participant Survey and Participant Survey – Audit-Only Participants, Question F1: "How satisfied were you with the quality of the home energy assessment?" (n≥51)

Figure 58. Customer Satisfaction with the Professionalism and Courtesy of the Contractor



Source: Participant Survey and Participant Survey – Audit-Only Participants, Question F3: "How satisfied were you with the professionalism and courtesy of your contractor**?"** (n≥51)

Figure 59. Customer Satisfaction with the Focus on Energy Program Overall

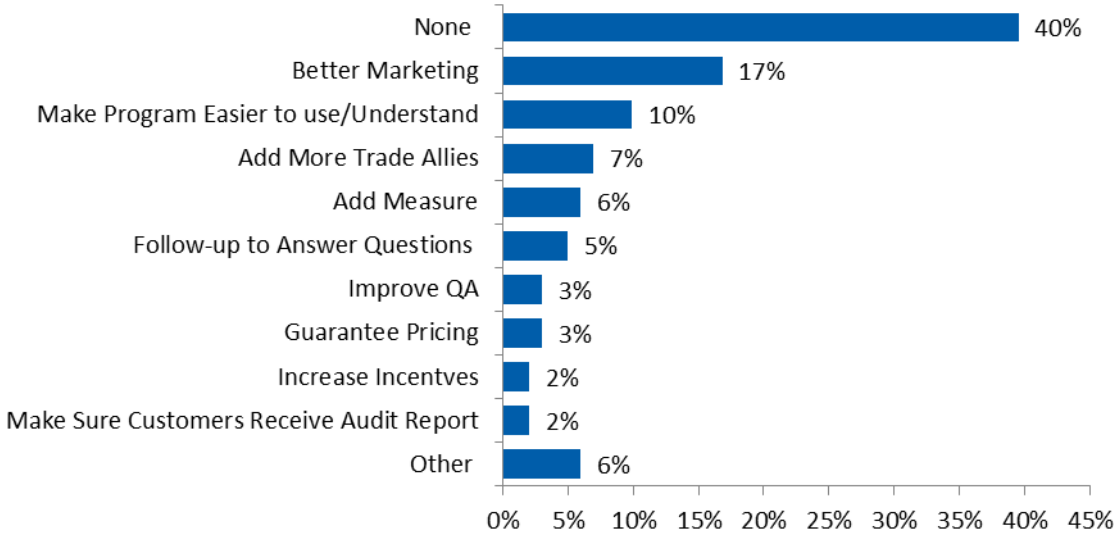


Source: Participant Survey and Participant Survey – Audit-Only Participants, Question F6: "How satisfied were you with the Focus on Energy Home Performance with ENERGY STAR Program overall?" (n≥51)

Suggestions to Improve the Program

Most retrofit customers (61%, n=66) said they had no suggestions for improving the Program. Those who did offer suggestions tended to focus on making people more aware of the Program and making specific features easier, such as finding a contractor and understanding incentive levels.

Figure 60. Areas of Program Improvement Suggested by Retrofit Customers



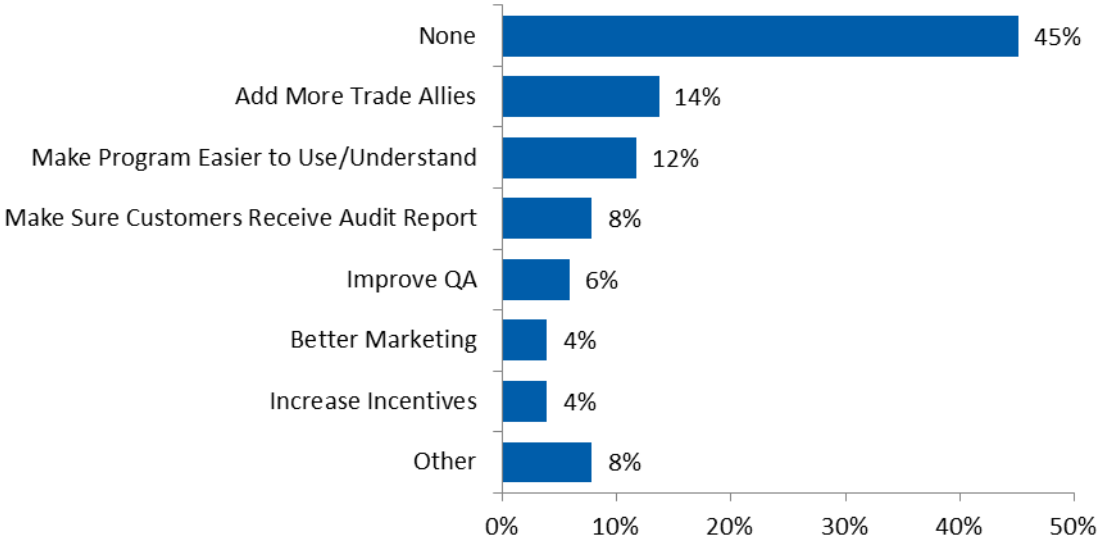
Source: Participant Survey, Question F9: "Is there anything you would suggest to improve Focus on Energy's Home Performance with ENERGY STAR Program?" (n=72)

Unlike retrofit customers, all but one audit-only customer had at least one suggestion for how to improve the Program. These suggestions often did not correspond to those offered by the retrofit customers.

Figure 61 shows the main categories that audit-only customers mentioned. The most common category "Make Program easier to use" includes comments such as "the rebate incentives were unclear," "the website was confusing," and "I didn't know there was a deadline for the retrofit," as well as one request for materials in Spanish.

The category "More choice of contractors" is straightforward; it includes requests for more or "better" insulation contractors or auditors. "Improve contractor communication" includes comments from customers who wanted more follow-up, more explanation, or claimed that their contractor told them something the Evaluation Team deemed a probable misunderstanding, such as "must replace all electric wiring before any work can be done."

Figure 61. Areas of Program Improvement Suggested by Audit-only Customers



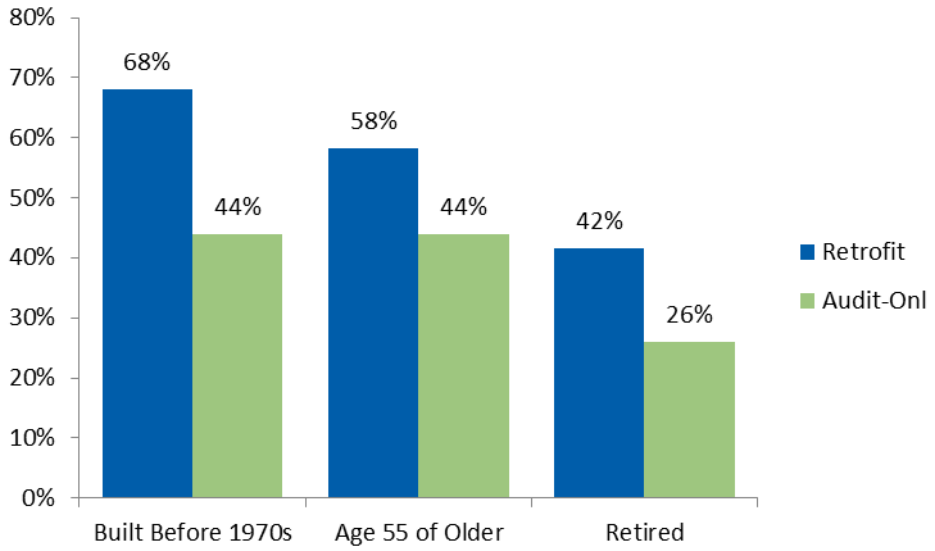
Source: Participant Survey – Audit-Only Participants, Question F9: "Is there anything you would suggest to improve Focus on Energy's Home Performance with ENERGY STAR Program?" (n=51)

Demographics

Audit-only and retrofit customers were very similar in many areas. In both groups, 94% or more of respondents lived in a single-family home that they owned. A large majority of both groups had natural gas heat and natural gas water heaters. However, they differed in some ways. Figure 62 shows both groups' key characteristics. Retrofit customers were more likely to have older homes than audit-only customers, tended to be older themselves, and were more likely to be retired.

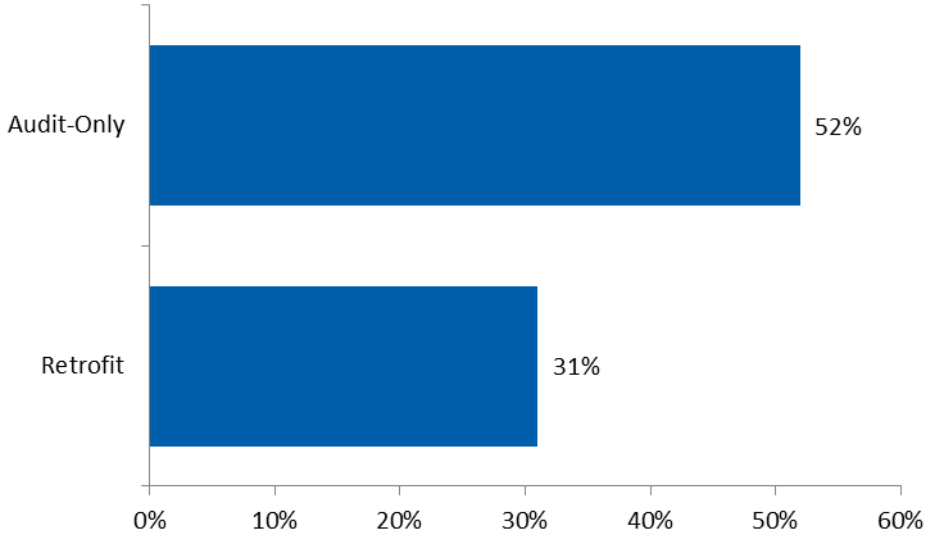
Retrofit customers also tended to have slightly smaller homes than audit-only customers, by square footage.

Figure 62. Characteristics of Retrofit and Audit-Only Customers



Source: Participant Survey and Audit-Only Participant Survey: Questions J8 "About when was your home first built?," J14 "Which of the following categories best represents your age?," and J16 "If you are currently employed, what industry do you work in?" (n≥51)

Figure 63. Percentage of Homes over 2,000 Square Feet



Source: Participant Survey and Audit-Only Participant Survey: Questions J6 "Approximately how many square feet of living space does your home have?" (n≥51)

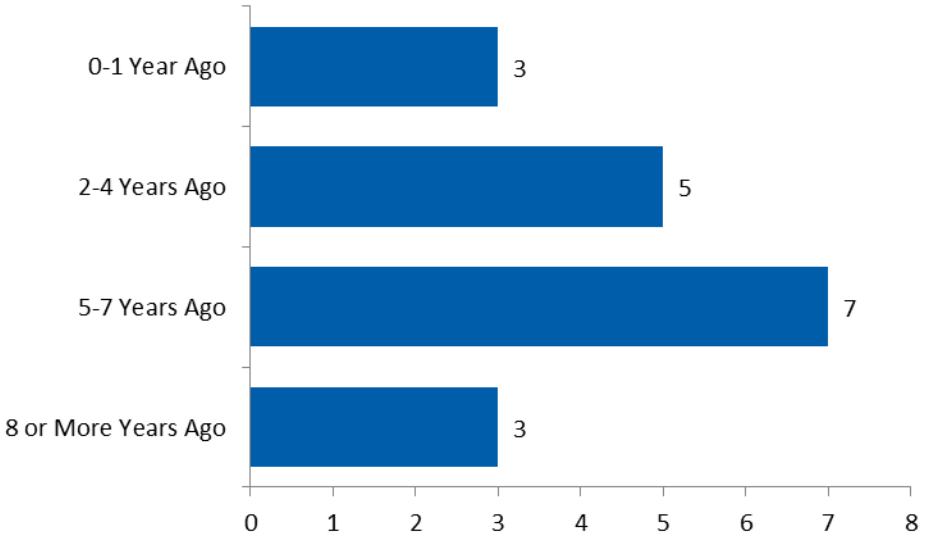
Trade Ally Experience

The Evaluation Team interviewed 20 Trade Allies, who were selected at random. Between 60 and 70 Trade Allies were active in the Program during CY 2013, with numbers shifting slightly throughout the

year as new Trade Allies joined and others dropped out. According to the Program Implementer, this is roughly the same number of Trade Allies involved in CY 2012. However, the Program Implementer reported it made a focused effort to recruit the largest insulation installation businesses in the state into the CY 2013 Program because these businesses have the potential to drive large project numbers through the Program.

The Evaluation Team found that the majority of the Trade Allies interviewed have been involved with the Program since before 2012. Figure 64 shows Trade Ally longevity in the Program.

Figure 64. When Trade Allies Became Participating Contractors for Home Performance with ENERGY STAR



Source: Trade Ally Interview, Question 2: "When did your company become a participating contractor for the Home Performance with ENERGY STAR Program?" (n=18)

The interviewed Trade Allies represented a mix of contractors who do home energy assessments only, insulation and air sealing only, or both services. Table 80 shows the business distribution.

Table 80. Services Offered Through the Program

Services Offered	Number
Home Energy Assessments	5
Retrofit Work (Insulation/Air Sealing)	8
Both (Retrofit and Assessments)	7

Source: Trade Ally Interview, Question 4: "What services does your firm offer for the Program?" (n=20)

All of the Trade Allies interviewed who performed only audits said they had a network of partner contractors they recommended to clients for installation work. It was not clear to the Evaluation Team whether all of these partner contractors were Program Trade Allies.

For those Trade Allies who did not specifically mention performing audits, it was not clear to the Evaluation Team whether these Trade Allies subcontract home energy assessments to auditors or work as subcontractors to an auditor. However, according to the Program design, one Trade Ally must manage the whole project for the customer, from assessment to job completion.

Most Trade Allies seemed well-engaged in the Program. Eight Trade Allies reported the Program represented at least 50% of their business, and another five said it represented at least 20% of their business. However, three Trade Allies noted that they were only able to do so much work through the Program because they could combine incentives with the Green Madison Program,[21] an American Recovery and Reinvestment Act (ARRA)-funded initiative that ended in 2013.

Program Process

The Evaluation Team asked Trade Allies several questions about Program processes. Their responses often focused on suggestions for streamlining paperwork or clarifying paperwork requirements. Eight stated that paperwork could be streamlined, but they had different ideas on how:

- Improve the website. (1)
- Redesign Program forms to follow the EM HOME format. (1)
- Make EM HOME easier to use and faster to load. (2)
- Reduce documentation required for the co-op marketing Program. (1)
- Allow Trade Allies to print a copy of the "post-completion report" themselves, rather than having to request a copy from the regional coordinators. (1)
- Have EM HOME generate a more customized report for each home. (1)
- Consolidate all forms into one form, so you can print with one click and there is less uploading and downloading required. (1)
- Have the Implementer reach out to Trade Allies if there is a mistake in paperwork. (2)

One Trade Ally liked the ability to scan documents and upload to EM HOME. Ten thought the paperwork requirements were clear, and six did not have any suggestions for consolidating paperwork.

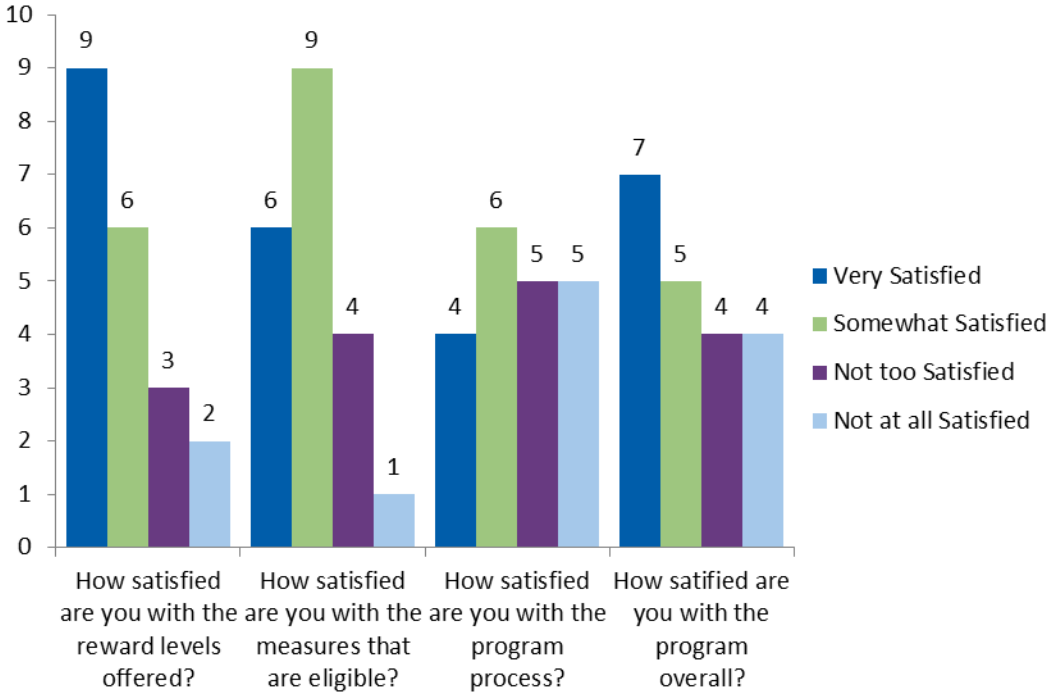
[21] Green Madison, funded through the U.S. Department of Energy's Better Buildings program, was a community-based energy-efficiency program that promoted the Focus on Energy incentives and also offered affordable financing for the remainder of the project cost. The program closed in September 2013.

Another process issue that many Trade Allies discussed was the "instant discount" system, introduced in CY 2012. In this process, the Trade Ally deducts the incentive amount from the customer's bill and then submits a reimbursement application to the Program Implementer. Eight Trade Allies mentioned having problems with the instant discounts. Seven of these said this policy strains their cash flow since they have to wait to receive the incentive. Four complained they were not informed when an application issue held up incentive disbursement and they had to search for a particular project in EM HOME to find out why the check was not being processed. Two Trade Allies said the checks they received from the Program do not identify what customer or project they are for, which makes recordkeeping difficult.

Trade Ally Satisfaction

In CY 2012, the Evaluation Team interviewed two Trade Allies, both of whom reported they were very satisfied with the Program overall. However, in CY 2013 when the Evaluation Team interviewed a larger Trade Ally pool, the response was more mixed. Figure 65 presents the results of questions about satisfaction with reward levels, eligible measures, Program process, and the Program overall.

Figure 65. Trade Ally Satisfaction with Aspects of the Program



Source: Trade Ally Interview, Question 44: "How satisfied are you with [Program aspect]?" (n=20)

Though not all were satisfied, only a few Trade Allies had specific complaints or recommendations for ways to improve the Program. One Trade Ally requested an incentive for pipe wrap installation. One requested that there be rewards for lower savings levels or for less intensive insulation and air sealing

projects; this would accommodate participants who did not want to do as much or could not afford it. One Trade Ally requested an incentive for the home energy assessment.

Seven contractors said they wanted an incentive added for installing ventilation, since Program standards require ventilation for several jobs. One Trade Ally wanted the Program to reinstate all of the measures that were allowed under the previous Program model (prior to 2012) to enable the "whole home approach."

Trade Allies were least pleased with the Program process. The reasons for dissatisfaction are discussed in the Program Process section above. Eight Trade Allies reported they were not satisfied with the Program overall. Of these, seven said they preferred the old Program model. More specifically, one said he thought the previous model offered more training and helped Trade Allies meet continuing education requirements for Building Performance Institute, Inc. (BPI), certification, which is required for Program participation. Another Trade Ally liked the contractor rewards offered under the prior program.

Training

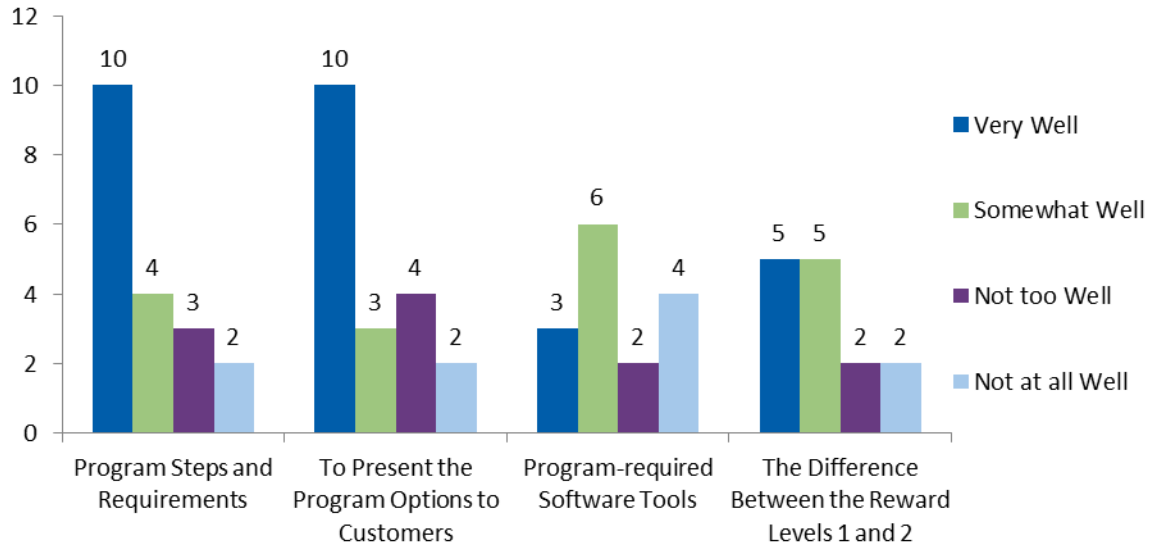
Most Trade Allies gave positive feedback regarding Program training. However, two said they had not received training for the current Program. One of these Trade Allies joined the Program two months ago. The other has participated for ten years but said he has not received any training in the last two years. It was not clear to the Evaluation Team whether this Trade Ally did not know about available training sessions or was unable to attend them.

Although most Trade Allies were generally satisfied with the training, several had specific requests to improve training. Four said they would like additional training on the EM Software; one said the software did not work as shown in the training. Three Trade Allies requested additional training on insulation standards. One of these said, "[The Program Implementer has] created a summary of the most common things that are not being done correctly now. It would be nice to have a quick webinar that shows someone doing those procedures correctly."

Figure 66 presents Trade Ally responses when the Evaluation Team asked how well they had learned various aspects of the Program. Because there were only 18 responses, the data is not presented as percentages. However, the data indicates that most Trade Allies thought they learned the Program steps and requirements and how to present the Program to customers very well. Nine said they learned the Program-required software tools well, but six did not think they learned the tools well. Software proficiency was the area in which Trade Allies had the least confidence.

Ten thought they learned very well or somewhat well the difference between the Reward Level 1 and Reward Level 2 options.

Figure 66. How Well Trade Allies Learned Aspects of Program



Source: Trade Ally Interview, Question 14: "How well did the training prepare you [in regard to Program aspect]?" (n=20)

The Program seems to have resolved any confusion regarding the differences between the Home Performance Program and the Assisted Home Performance Program. While the Evaluation Team did not conduct a full marketing review, it did review the Program's website page. The page concisely and clearly illustrates the difference between the two reward levels, using simple tables and text. As the differences are related only to eligibility and available incentives, the page thoroughly explained the difference without intimidating detail.

Program Cost-Effectiveness

Evaluators commonly use cost-effectiveness tests to compare the benefits and costs of a demand-side management program. The benefit/cost (B/C) test used in Wisconsin is a modified version of the TRC test. Appendix I includes a description of the TRC test.

Table 81 lists the CY 2011-2013 incentive costs for the Home Performance with ENERGY STAR Program.

Table 81. Home Performance with ENERGY STAR Program Incentive Costs

	CY 2013	CY 2011-2013
Incentive Costs	$ 3,084,745	$ 3,084,745

The Evaluation Team found the CY 2013 Program to not be cost-effective (a TRC benefit/cost ratio above 1). Table 82 lists the evaluated costs and benefits.

Table 82. Home Performance with ENERGY STAR Program Costs and Benefits

Cost and Benefit Category	CY 2013	CY 2012
Costs		
Administration Costs	$378,373	$444,924
Delivery Costs	$862,860	$1,014,625
Incremental Measure Costs	$6,409,669	$2,728,017
Total Non-Incentive Costs	$7,650,903	$4,187,565
Benefits		
Electric Benefits	$1,415,415	$419,844
Gas Benefits	$4,928,248	$1,162,264
Emissions Benefits	$1,498,449	$276,707
Total TRC Benefits	$7,842,111	$1,858,815
Net TRC Benefits	**$191,209**	**($2,328,750)**
TRC B/C Ratio	**1.02**	**0.44**

Evaluation Outcomes and Recommendations

The Evaluation Team identified the following outcomes and recommendations to improve the Program.

Outcome 1. The Program's performance in terms of participation and savings improved over CY 2012.

Program performance improved over CY 2012, the first year of the Program, during which it fell short of its savings and participation goals. The majority of energy savings came from the major measures, which made up 65% of the electric savings and 98% of the natural gas savings. Attic insulation accounted for 40% of overall major measure savings, followed by wall insulation (29%) and air sealing (21%). Foundation and sill box insulation accounted for 9% of overall savings combined. The Program Implementer noted that the major measures made up for underperformance in the direct install category.

Outcome 2. Incorporating the Assisted Home Performance Program into the Home Performance Program as "Reward Level 2" did not appear to cause confusion with customers or Trade Allies and may have alleviated confusion about the difference between the two Programs.

The Evaluation Team found the explanation of reward level differences on the Focus on Energy website was well executed. Customers did not express any confusion between the two reward levels. A majority of Trade Allies reported they had been well trained on the two rewards levels' differences. This change appeared to have been successfully implemented.

Outcome 3. Trade Allies were the Program's most effective marketing channel.

"Contractor" was the most frequently cited source of information about the Program among retrofit customers by a wide margin. Audit-only customers did not mention contractors as frequently, which indicated that when Trade Allies presented the Program to a customer they were more likely to achieve

a conversion to a major measures installation than if customers learned about the Program through a different channel. Direct Trade Ally contact appeared to be by far the most effective marketing channel. In addition, retrofit customers were far more likely to state the Trade Ally was helpful in understanding the audit report, and no retrofit customers indicated they felt the Program needed to be "less confusing."

Recommendation 3. Improved training for trade allies could make them even more productive for the Program. The findings above imply that some customers had Trade Allies that were less able or less willing to explain the audit report and the Program options to their customers. Improved or repeated, periodic training could ensure that Trade Allies are able to clearly explain the Program steps and options to all customers, possibly increasing participation and reducing confusion.

Outcome 4. The Program was able to grow this year, despite having the same number of Trade Allies as the previous year. Such continued growth may not be sustainable.

More projects than in the previous year are approaching the maximum rebate levels, and many Trade Allies indicated the Program was a major part of their business. These results could indicate that, having had two full cycles to adjust to the new Program, Trade Allies were getting better at selling the Program to customers. There may be a limit to how much more the Program can grow without bringing in new Trade Allies. Although the Program Implementer reported some turnover in the Trade Ally network over the year, just three out of 20 Trade Allies interviewed had joined in CY 2013.

Recommendation 4. Recruit new Trade Allies into the Program. Because Trade Allies are so important to Program marketing, the number of participants was closely tied to the number of Program Trade Allies. Recruiting the largest insulation contractors to be Trade Allies, as the Program Implementer has already done, has been a good start. The Program Implementer should also make sure that the entire Focus on Energy territory has adequate coverage, and that the Program does not rely too heavily on just a handful of Trade Allies.

Outcome 5. Smaller businesses that developed under the old Program model were ill-equipped to deal with some of the elements of the new model.

Managing the delayed cash flow that results from the "instant reward" seemed particularly difficult for contractors.

Recommendation 5a. Investigate ways to help smaller Trade Allies stay involved. Survey the Trade Allies to identify to what degree the delay in rebate processing is an issue, and whether it might force smaller Trade Allies out of the Program. If so, then consider ways to remediate the instant rebate burden. Increasing the rebate processing time may be all that is needed to keep smaller Trade Allies involved.

Recommendation 5b. Focus on improving the Trade Ally Program experience. While most Trade Allies were satisfied with most Program areas, overall Trade Ally satisfaction numbers could be improved, particularly for Program processes. The Program should consider Trade Ally suggestions for streamlining

the process, particularly targeted suggestions such as adding the customer name to the incentive checks and redesigning the form to match EM HOME output. Improving the user-friendliness of the EM HOME software, which many Trade Allies described as difficult to use and slow, could do a great deal to improve their satisfaction.

Recommendation 5c. Make the co-op marketing system more hands-on and service oriented. Fewer than half of the Trade Allies interviewed participated in the co-op marketing system, and one reported that the paperwork was cumbersome and time-consuming. Making the system easier to navigate could increase contractor uptake.

The Program should consider creating pre-designed, customizable materials that it can order on Trade Allies' behalf. Such an approach could make selecting and designing materials easier, and it could also alleviate some of the billing paperwork. In addition, the Program Implementer should schedule a face-to-face meeting with the marketing decision-maker at each highly engaged Trade Ally. The meeting could review Program requirements and also focus on getting the Trade Ally involved in the co-op marketing system. This kind of dedicated attention could foster closer relationships, quickly resolve any lingering questions, and help Trade Allies better market the Program.

Outcome 6. Retrofit customers have a significantly different profile than audit-only customers.

The Program Implementer should continue to use e-mails or newsletters to inform Trade Allies of these findings. Marketing materials should target customers by house type, age, and motivation, if they do not already. The program could provide this marketing information along with ideas for new marketing materials, and use the communication opportunity to remind Trade Allies about the cooperative marketing system.

Recommendation 6. Share market information with Trade Allies. An e-mail or newsletter to contractors could inform Trade Allies of this finding. Marketing materials should target customers by house type, age, and motivation, if they do not already. The Program could provide this marketing information along with ideas for new marketing materials, and use the communication opportunity to remind Trade Allies about the cooperative marketing system

Outcome 7. The Program design does not encourage Trade Allies to cross-sell it with the Residential Rewards Program, which is needed to make the Program truly "whole-home."

Many Trade Allies reported they do not cross-sell the HVAC measures that are eligible under the Residential Rewards Program, which means customers are not being approached from a truly "whole-home" perspective. Insulation contractors are not motivated to add services or partner with HVAC contractors under the current Program, because these efforts do not increase their revenue and require additional complicated and time-consuming paperwork.

Recommendation 7. Consider ways to break down barriers between the programs or to reward Trade Allies for successfully engaging customers in both programs. Identify the Trade Allies who have worked

with customers who participated in both Residential Rewards (for measures other than insulation) and Home Performance and meet with them to discuss their motivation for promoting both programs and their business model. These businesses may have ideas about the best way for Trade Allies to help customers benefit from both Programs. Work with the Residential Rewards Trade Allies, in particular the HVAC contractors, to promote partnerships with Home Performance Trade Allies. Ways to promote collaboration might include networking events; public accolades for contractors who use both Programs, such as an article in a newsletter sent to Trade Allies; or a bonus system for Trade Allies with customers that use both programs. A bonus could take the form of cash, or marketing assistance.

Outcome 8. The billing analysis was limited due to the small number of accounts that had sufficient pre- and post-installation period billing data. The lack of sufficient data limited the precision of savings estimates.

Recommendation 8. Consider performing another billing analysis when more post-installation period billing data are available. This will allow for much more precise savings estimates with larger analysis samples.

Outcome 9. In both the electric analysis and gas analysis, the *ex ante* estimates are not responsive to variations in home size. However, the evaluated savings depended considerably on the pre-installation usage. This contributed to decreasing the Program's realization rate.

Recommendation 9. Consider calibrating *ex ante* savings estimates to pre-installation consumption. More reliable savings estimates can be obtained if the *ex ante* savings estimates can be calibrated to actual pre-installation period billing data. This would improve the reliability of the Program's tracking data.

Outcome 10. The Program did not establish measure eligibility criteria regarding the baseline condition, nor did it cap the maximum insulation R-value and air sealing levels. A review of the detailed data reported by the Program Implementer's database shows that many homes with a low initial home air infiltration or high existing attic insulation R-value received this measure, resulting in a much lower degree of savings than for "leaky" homes. It is unclear what effect, if any, this had on the realization rate for the Program. A frequency of each condition would be required to make an assessment.

Recommendation 10. Enforce eligibility criteria to ensure only homes with savings potential are treated in the Program. By instituting a cap, the Program will ensure that contractors provide envelope measures only to homes where there is potential for these measures to provide significant energy savings given the limited resources of the Program.

Outcome 11. The SPECTRUM database contains only high-level information in the presentation of savings for installed measures. While the Program Implementer's database contains greater measure detail, the lack of detailed tracking limits transparency in Program Tracking. The Evaluation Team can

use further details regarding the envelope measures to more definitively assess the potential causes for the Program's realization rate.

Recommendation 11. The SPECTRUM database should carry forward some of the measure data present in the Program Implementer's database. This would allow for more transparent documentation and a more robust analysis of the Program's impacts and potential causes of discrepancies between the *ex ante* and *ex post* savings.

Assisted Home Performance with ENERGY STAR ® Program (Home Performance with ENERGY STAR® Program, Reward Level 2)

The Evaluation Team conducted both an impact and process evaluation of the Assisted Home Performance with ENERGY STAR Program also known as the Home Performance with ENERGY STAR® Program, Reward Level 2 Program.

The Assisted Home Performance with ENERGY STAR is a whole-house energy-efficiency retrofit program available to income-eligible residential customers. Trade Allies conduct a free abbreviated home assessment and offer participants both free direct install measures (installed at the time of the visit) and incentives for installing building shell measures. To be eligible for the Program, participants must meet these criteria:

- Own either a detached single-family home or a single residence in a building with three or fewer units
- Heat more than 50% of the home through a participating utility
- Have an annual household income that is 80% of the State Median Income (SMI) or less

The annual *ex post* verified total gross annual savings for CY 2013 are 400,803 kWh and 212,309 therms.

The Program was implemented in CY 2011 under the name Targeted Home Performance Program. In CY 2012, the Program was restructured and renamed the Assisted Home Performance with ENERGY STAR Program. In CY 2013, the Program Implementer, CSG, aligned the Program more closely with the Home Performance with ENERGY STAR Program. The Implementer combined marketing efforts and now presents both programs jointly to customers and Trade Allies. The Home Performance with ENERGY STAR chapter, above, provides cross-program findings; this chapter provides issues specific to the Assisted Home Performance Program.

The sole CY 2012 recommendation specific to the Assisted Home Performance Program was to "monitor Assisted Home Performance with ENERGY STAR Program participation and available funds closely and take steps to ensure there are no gaps in Program delivery between calendar years." The Evaluation Team reviewed the Program Administrator's and Program Implementer's responses to this recommendation as part of this evaluation report.

Table 83 lists the Program's actual spending, savings, participation, and cost-effectiveness from CY 2011 through CY 2013.

Table 83. Assisted Home Performance with ENERGY STAR Program Actuals Summary[1]

Item	Units	CY 2013 Actual Amount	CY 2011-CY 2013 Actual Amount[2]
Incentive Spending	$	$1,416,780	$3,562,831
Verified Gross Life-Cycle Savings	kWh	6,569,216	17,836,129
	KW	173	261
	Therms	3,224,017	5,187,168
Net Annual Savings	kWh	400,803	867,088
	KW	173	261
	Therms	212,309	295,544
Participation	Assessments	723	1,043
	Installations	578	888
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	2.98	0.13 [3]

[1] This table presents gross life-cycle savings to allow comparison with Focus on Energy's quadrennial gross life-cycle savings target, and net annual savings to allow assessment of the Program Administrator and Program Implementer's achievement of net annual savings.

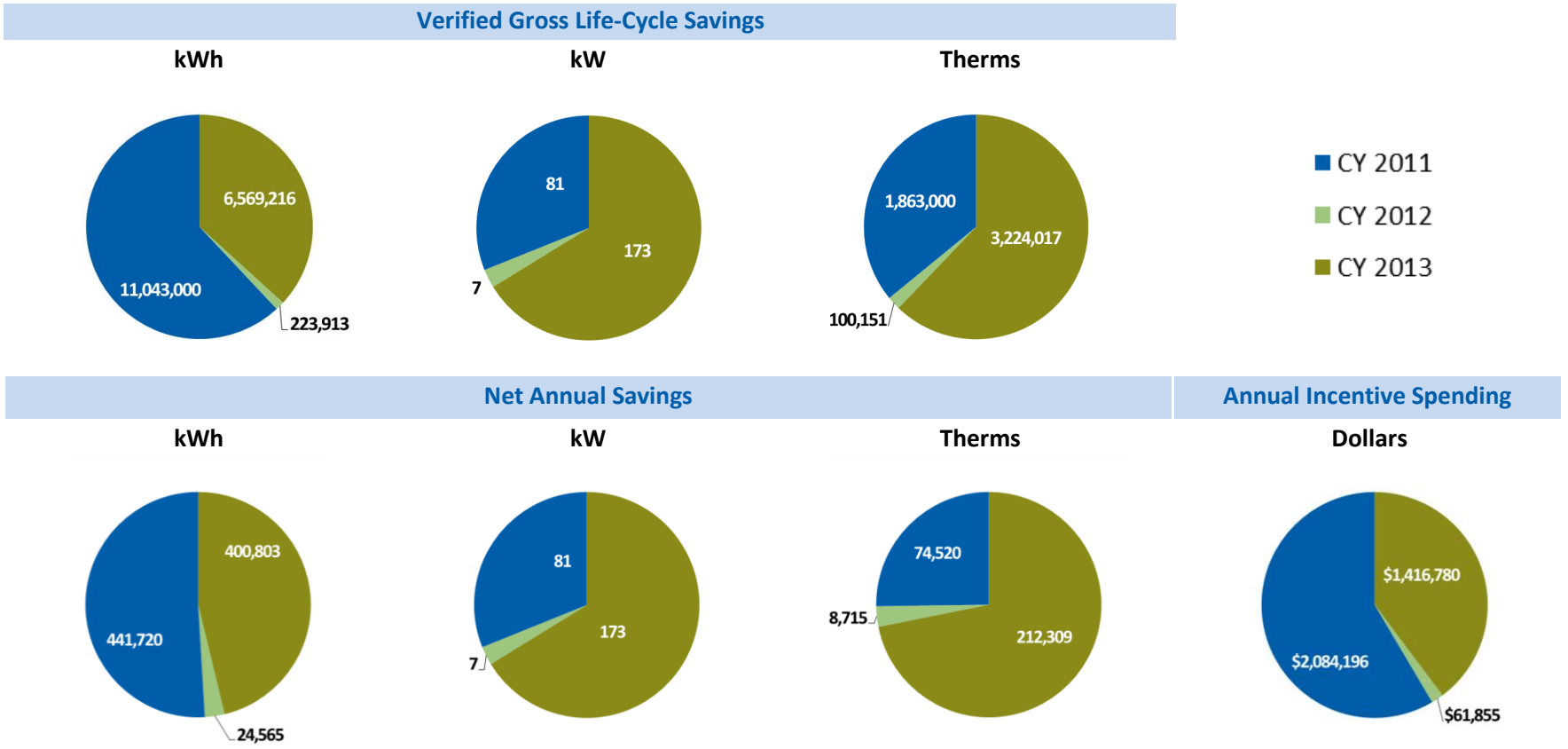
[2] The CY 2011 Program iteration was known as the Targeted Home Performance Program.

[3] The cost-effectiveness ratio is for CY 2012 only.

Figure 67 presents savings and spending in 2011, 2012, and 2013. In 2011, the Program ran as the Targeted Home Performance Program, a consultant-driven model program that offered income-eligible customers free home energy assessments; infiltration measures; heating, cooling, water heat, and refrigeration equipment replacement; CFLs; and water-saving measures. The Targeted Home Performance Program was not cost-effective and was terminated before year's end.

Restructured in 2012, the Assisted Home Performance Program offers income-eligible customers free home energy assessments, infiltration measures, and direct install CFLs and water-saving measures. In addition to offering different measures, the Program delivery is a contractor-driven model in which the customer need only work with one Trade Ally throughout the entire process. The new 2012 Program had a slow uptake; in 2013 the Program experienced a surge in participation, due in part to cross-promotion with grant-funded programs in Madison and, in particular, in Milwaukee.

Figure 67. Assisted Home Performance with ENERGY STAR Program Three-Year (2011-2013) Savings and Spending Progress



Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted impact and process evaluations for CY 2013. These were the key questions that directed the Evaluation Team's design of the EM&V approach:

- What are the verified gross and net electric and gas savings?
- What are the objectives and the delivery process for the Program?
- What are the key roles and responsibilities?
- How has the change in Program structure affected Trade Ally participation, process flows, measure selection, savings goals, barriers to participation, and overall functioning?
- How can the Program be improved so as to increase the energy and demand savings?
- What are the barriers to increased customer participation, and how effectively does the Program overcome those barriers?

The Evaluation Team designed its EM&V approach to integrate multiple perspectives in assessing Program performance. Table 84 lists the specific data collection activities and samples sizes used to evaluate the Program.

Table 84. Assisted Home Performance with ENERGY STAR Program
CY 2013 Data Collection Activities and Sample Sizes

Activity	CY 2013 Sample Size (n)	CY 2011-2013 Sample Size (n)
Program Database review	Census (723 homes)	Census (1,043 homes)
Participant Surveys	67	67
Audit-Only Surveys	50	50
Participant Trade Ally Interviews	20	22
Stakeholder Interviews	2	4

Data Collection Activities

The Evaluation Team conducted the following evaluation activities in CY 2013:

- **Program database review:** Detailed review of SPECTRUM, the Program database, for completeness and accuracy of Program data.
- **Program Administrator and Implementer Interviews**
- **Participant customer surveys:** customers who received the home assessment, direct install measures, and installed building shell measures and/or air sealing measures. In CY 2013 578 customers installed building shell measures and/or air sealing measures.

- **Audit-only customer surveys**: The Evaluation Team surveyed customers who received the home assessment and direct install measures but did not install building shell measures and/or air sealing measures. In CY 2013, 157 customers were identified as "audit-only customers."
- **Participant Trade Ally Interviews**

Impact Evaluation

To calculate gross savings, the Evaluation Team reviewed tracking data in the Program database (SPECTRUM). To calculate net savings, the Evaluation Team leveraged applicable findings from SPECTRUM and the Implementer's audit-tracking database (EM HOME). EM HOME is also used by the Implementer and its contractors as an audit tool to calculate the savings that can be expected from each home if certain upgrades are undertaken.

For the CY 2012 evaluation, the Evaluation Team evaluated the modeling capabilities of EM HOME for both the Home Performance and Assisted Home Performance Programs. The Evaluation Team found the savings estimates calculated by EM HOME were consistent with those calculated by other commonly used tools.

The Evaluation Team also conducted a review of the Assisted Home Performance Program database and SPECTRUM and conducted engineering reviews to evaluate the reported gross electric and gas savings. Recommended adjustments to these values have been entered into SPECTRUM to take effect beginning on January 1, 2014.

Evaluation of Gross Savings

Table 85 shows the overall tracked and verified gross energy impacts (kWh, kW, and therms) for the Program in CY 2013. The Evaluation Team compared the savings documented in the Program database and verified these with the reported Program savings. Table 85 shows the results of this tracking database review, described in more detail below.

Table 85. Assisted Home Performance Program Gross Savings Summary

Savings Type	Gross			Verified Gross		
	kWh	kW	Therms	kWh	kW	Therms
Annual	395,178	173	212,403	400,803	173	212,309
Life-Cycle	6,491,809	173	3,225,819	6,569,216	173	3,224,017

Tracking Database Review

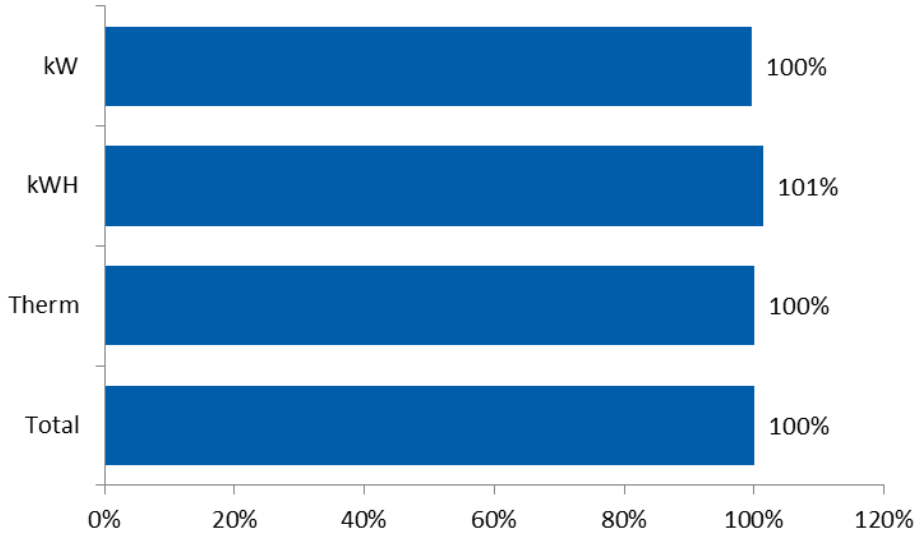
The Evaluation Team reviewed the CY 2013 data contained in SPECTRUM for completeness and quality. The Evaluation Team used deemed assumptions and algorithms coupled with Program data to verify measure-level savings. All measures were nearly identical to the reported unit-energy savings, with the exception of a few data entry errors that resulted in differences between the reported savings and the records in SPECTRUM.

Realization Rates

Overall, the Program achieved an evaluated realization rate of 100%. Thus, the gross savings reported in the Program tracking database have been verified to have been achieved and exceeded, in accordance with the Program operating and previously agreed upon evaluation criteria.

Figure 68 shows the realization rate by fuel type.

Figure 68. Assisted Home Performance Program Realization Rate by Fuel Type



Gross and Verified Gross Savings Results

Table 86 lists the total and verified gross savings, by measure type, achieved by the Assisted Home Performance Program in CY 2013.

Table 86.Assisted Home Performance with ENERGY STAR Program Gross Savings Summary[1]

Measure Type	Gross			Verified Gross		
	kWh	kW	Therms	kWh	kW	Therms
Lighting – CFLs	177,876	20	-	179,841	20	-
Building Shell – Project Completion	205,147	153	206,676	205,147	153	206,676
DHW[1] – Faucet Aerator	5,785	-	1,972	5,604	-	2,119
DHW[1]– Low-Flow Showerheads	5,761	-	3,612	9,465	-	3,363
DHW[1]– Water Heater Pipe Insulation	376	-	48	514	-	55
Adjustment Measures[2]	232	-	96	232	-	96
Total Annual	**395,178**	**173**	**212,403**	**400,803**	**173**	**212,309**
Total Life-Cycle	**6,491,809**	**173**	**3,225,247**	**6,569,216**	**173**	**3,224,017**

[1] Domestic Hot Water.

[2] Adjustment measures are applied to correct for data entry errors in Program savings, such as incomplete entries, duplicate entries, and typing errors.

Evaluation of Net Savings

Net-to-Gross Analysis

The Evaluation Team has experienced that net-to-gross ratios and spillover are not influential factors in similar income-eligible programs. The Wisconsin PSC accepted a net-to-gross ratio of 1 for all income-qualified programs in the Program Specific Evaluation Plans for CY 2013. As such, the Evaluation Team applied a net-to-gross ratio of 1 to both the direct install measures and building shell measures.

Net Savings Results

Table 87 shows the net energy impacts (kWh, kW, and therms) for the Assisted Home Performance Program. The Evaluation Team attributed these net savings to reflect an estimate of what would have occurred without the Program.

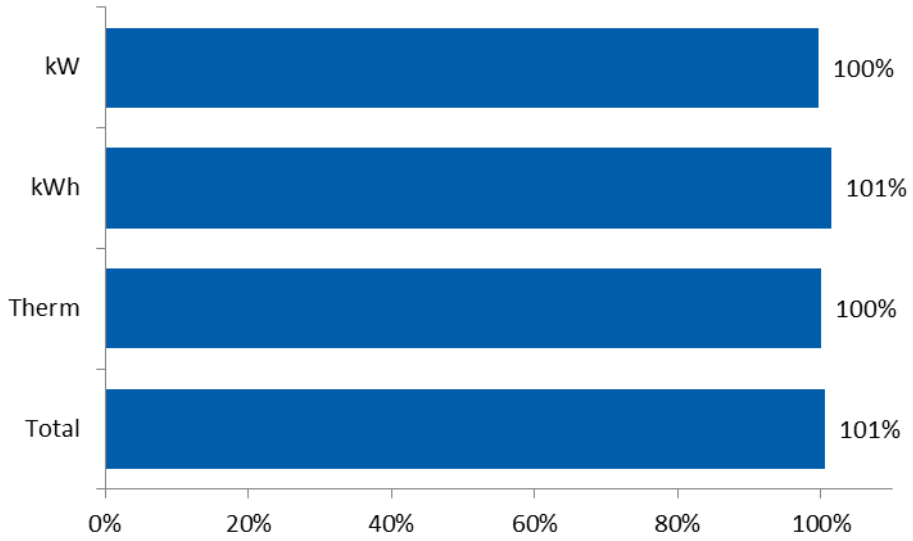
Table 87.Assisted Home Performance with ENERGY STAR Program Net Savings

Measure Type	Verified Net Savings		
	kWh	kW	Therms
Lighting – CFLs	179,841	20	-
Building Shell – Project Completion	205,147	153	206,676
Domestic Hot Water – Faucet Aerator	5,604	-	2,119
Domestic Hot Water – Low-Flow Showerheads	9,465	-	3,363
Domestic Hot Water – Water Heater Pipe Insulation	514	-	55
Adjustment Measures[1]	232	-	96
Total Annual	**400,803**	**173**	**212,309**
Total Life-Cycle	**6,569,216**	**173**	**3,224,017**

[1] Adjustment measures are applied to correct for data entry errors in Program savings, such as incomplete entries, duplicate entries, and typing errors.

Figure 69 shows the net savings as a percentage of the *ex ante* gross savings by fuel type.

Figure 69. Assisted Home Performance with ENERGY STAR Program Net Savings as a Percentage of *Ex Ante* Savings by Fuel Type



Process Evaluation

For CY 2013, the Evaluation Team collected data by conducting interviews with both stakeholders and Trade Allies and surveying both retrofit and audit-only participants. These data provide a broad array of perspectives with which to examine the research questions for the Assisted Home Performance Program.

As explained further below, the Assisted Home Performance Program and the Home Performance Program were combined into one Program with two reward levels. The Home Performance chapter addresses all elements general to both programs. This chapter addresses issues specific to the Assisted Home Performance Program.

Program Design, History, and Goals

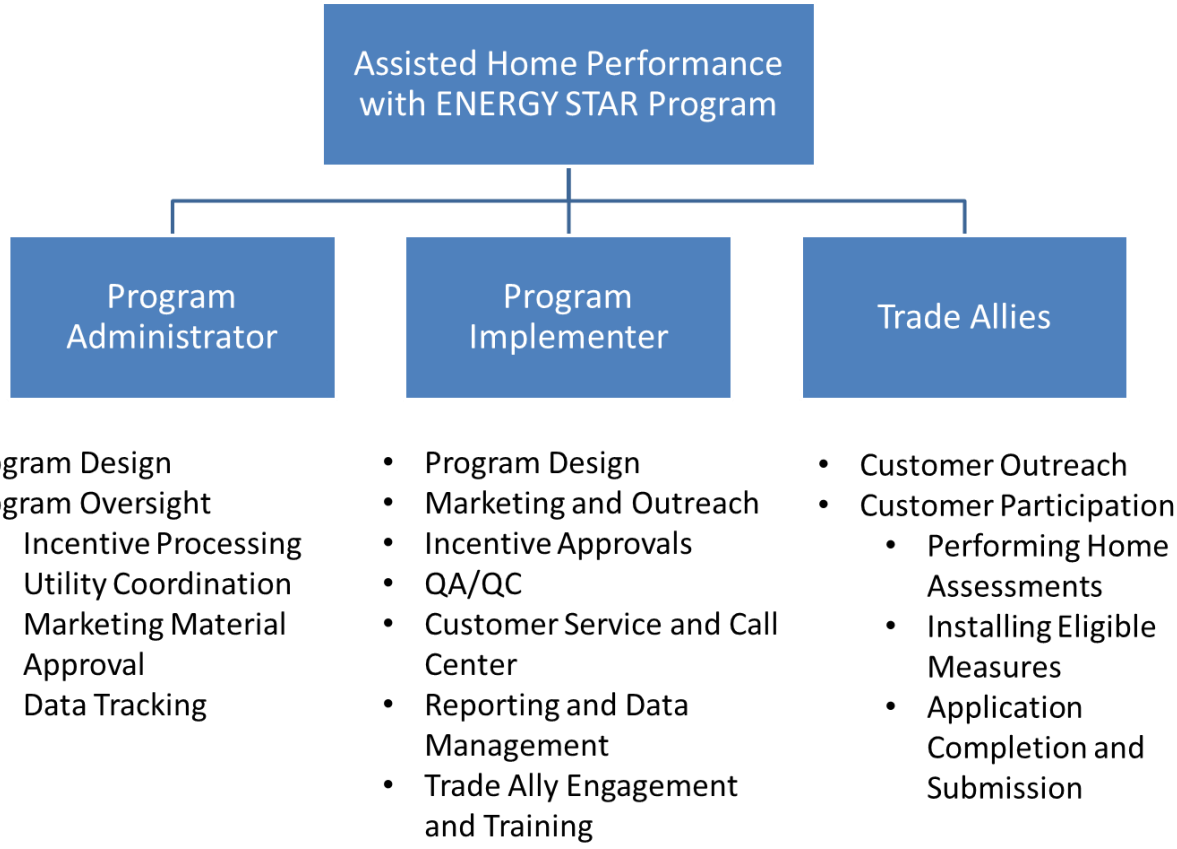
Focus on Energy introduced the Assisted Home Performance Program in CY 2012 to complement the Home Performance Program. For CY 2013, the Program Implementer merged the two programs into a single Home Performance brand, with two reward levels.

Reward Level 1 corresponds to the Home Performance Program and Reward Level 2 corresponds to the Assisted Home Performance Program. This revision is intended integrate the two service levels into one seamless delivery effort in order to ensure that anyone who is eligible receives the enhanced benefits under Reward Level 2. This coordinated structure makes the two programs (services) less confusing to both the Trade Allies who provide the service and to the customers who receive the services. This change is discussed in greater detail in the Home Performance Program chapter.

The Assisted Home Performance Program performed better than expected in CY 2013. The Evaluation Team's assessment indicates that the Program performed so well that during the midyear time period the PSC approved an increase in the participation goal and added additional funding for incentives. By the end of the year, the Program had exceeded its revised goals.

The Evaluation Team reviewed the Program management structure, including all partners' roles and responsibilities, Program materials, and data management systems. A diagram of the key Program Actors and roles for the Assisted Home Performance Program is provided in Figure 70.

Figure 70. Assisted Home Performance with ENERGY STAR Key Program Actors and Roles



Marketing and Outreach

The Program Implementer made several changes to the CY 2013 marketing approach. The Program Implementer and Administrator revised the website and marketing materials to incorporate the Assisted Home Performance Program as Reward Level 2 of the Home Performance Program. This change resolved confusion among Trade Allies and customers about having separate but similar programs.

Program uptake was much stronger in CY 2013 than in CY 2012. The Program's coordination with *Me*^{2}, a grant-funded initiative in Milwaukee, not affiliated with Focus on Energy, increased Program uptake.

Another grant-funded program, Green Madison, also coordinated with Assisted Home Performance projects towards the end of its implementation period in CY 2013.

Me² offered energy-efficiency education, energy audits, and whole-home retrofits with significant discounts to low- and mid-income homes in the Milwaukee area. Using a community-based approach that involved outreach through local organizations, *Me²* marketed its own incentives as well as the incentives offered through the Assisted Home Performance Program and the Enhanced Rewards Programs. According to the Program Implementer, in some cases a combination of the three programs (Assisted Home Performance Program, Enhanced Rewards Program, and *Me²* incentives) equaled over $8,000 in non-customer contributions for a single project.

Program Implementer's staff reported that *Me²* had far more participation than expected and that the majority of its participants also took advantage of the incentives offered by Assisted Home Performance Program. The Program Implementer did not track which of its projects also benefitted from the *Me²* incentives. As such, the Evaluation Team was not able to independently verify the level of overlap between the two programs. Nevertheless, the available data implies that the *Me²* program likely had a significant impact on Assisted Home Performance Program participation in CY 2013.

The Program tracking database indicated that 58% of CY 2013 Assisted Home Performance Program participants lived in Milwaukee (assessment-only and project completion customers). However, Milwaukee customers account for 72% of the Assisted Home Performance Programs CY 2013 energy savings (MMBtu), indicating the project's size in Milwaukee was larger than other areas (possibly as a result of the additional incentives). In addition, the *Me²* program website states that *Me²* completed 1,263 projects in the City of Milwaukee in 2013,[22] and it cross-promotes the Focus on Energy programs. And finally, three Trade Allies mentioned completing a large number of projects that relied on both programs. Green Madison was funded through the same grant program as *Me²*, but it operated with a slightly different model in the Madison area and appeared to have less of an effect on the Program.

Despite the additional marketing and large incentives of the Milwaukee and Madison grant programs, customers did not mention them in surveys. Only one customer, an audit-only participant, reported learning about the Assisted Home Performance Program through *Me²*. One customer heard about the Program from their contacts with Milwaukee County. Two customers who learned about the Program through an "energy assistance program" may have been referring to *Me²*. There is more discussion of how customers learned about the Program in the Customer Experience section of this chapter.

The *Me²* initiative closed in August of 2013; Green Madison ended in September of 2013. *Me²*'s managers hope to continue the initiative; however, they do not expect to find additional funding for incentives.

[22] *Me²* Program website: http://smartenergypays.com/

Customer Experience

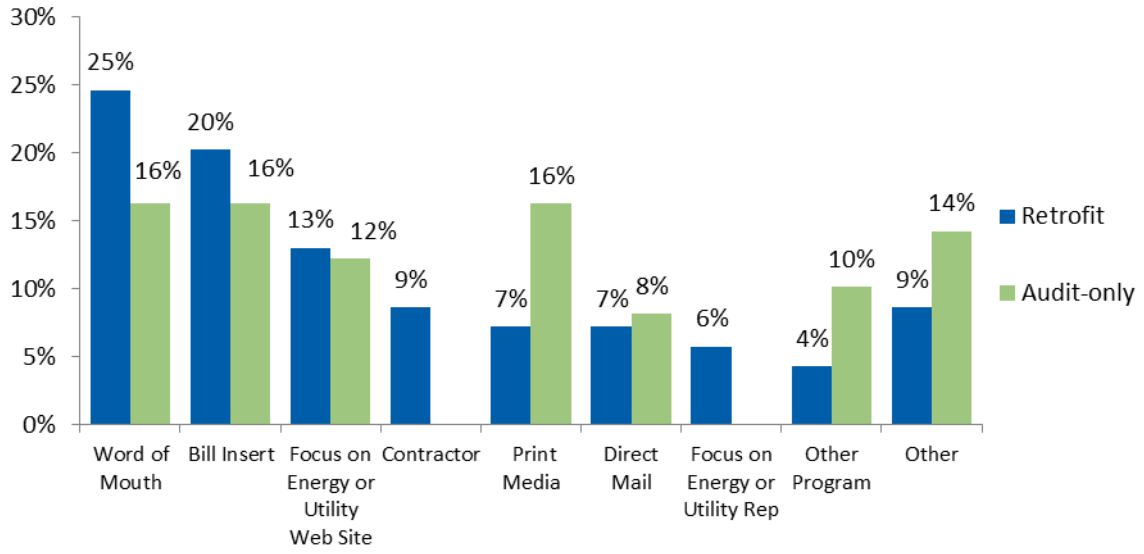
The Evaluation Team surveyed 70 customers who completed a retrofit and 50 customers who completed an audit but did not install any recommended measures with the Program.

Sources of Information

Participants who completed retrofits were most likely to report they first heard of the Program through word of mouth (25%; n= 69). The next most common channel for hearing about the Program was via a utility bill insert.

For audit-only customers, the first source of information about the Program was equally likely to be word of mouth, bill inserts, and other print media (Figure 71). Audit-only participants are more likely to hear about the Program through print media, and no audit-only participants heard about the Program from a contractor. This indicates that audit-only customers may not have been considering performing upgrades before they heard about the Program.

Figure 71. First Source of Information about the Assisted Home Performance Program



Source: Participant Survey and Audit-Only Participant Survey, Question QB1: "How did you FIRST LEARN about the Assisted Home Performance with ENERGY STAR Program offered by Focus on Energy?" (n≥49)

The Evaluation Team has reviewed several programs that, like *Me*^{2}, were funded by a U.S. Department of Energy Better Buildings grant. These programs are characterized by community-based marketing and often worked through neighborhood associations, churches, or other local groups. The Evaluation Team considers it possible that customers reported this as "word-of-mouth" marketing, but it cannot verify this with current information.

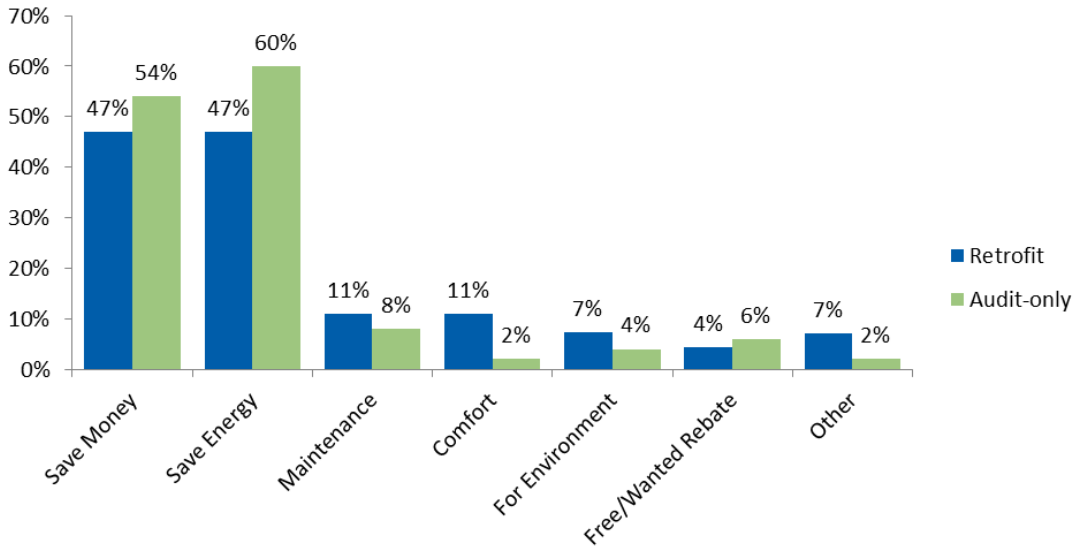
In both the Home Performance and Assisted Home Performance Programs, participants who learned about the Program through a Trade Ally were more likely to complete a retrofit.

Decision Influences

According to SPECTRUM, 80% of customers who received the free home energy assessment completed retrofit projects in CY 2013. When asked why customers chose to move forward with an assessment, most retrofit customers said they wanted to save money and save energy. Other reasons included to maintain their home (make upgrades they already felt were needed) and improve the home's comfort.

Figure 72 shows response frequencies. These results conform to two similar surveys conducted for similar programs on the east coast and in the southeast of the United States. In all three surveys, saving energy and saving money are by far the most popular drivers for participation in a home performance program, for both groups.

Figure 72. Why Participants had a Home Energy Assessment



Source: Participant Survey and Audit-Only Participant Survey, Question QD1: "Thinking back to the time when you were deciding to participate in the Assisted Home Performance with ENERGY STAR Program, what were the most important reasons you decided to have a home energy assessment?"
(n≥50, more than one response allowed)

In addition, across all surveys, a higher percentage of audit-only customers than retrofit customers responded that they wanted to save energy or save money. Higher percentages of retrofit customers responded they wanted to maintain or improve the value of their home, increase comfort in the home, or do something to help the environment. In general, retrofit customers were more likely to give multiple reasons for participating.

Eighty-one percent (n=65) of retrofit participants reported they received a written audit report from their auditor. Of these, 98% said that the report was either "very important" or "somewhat important"

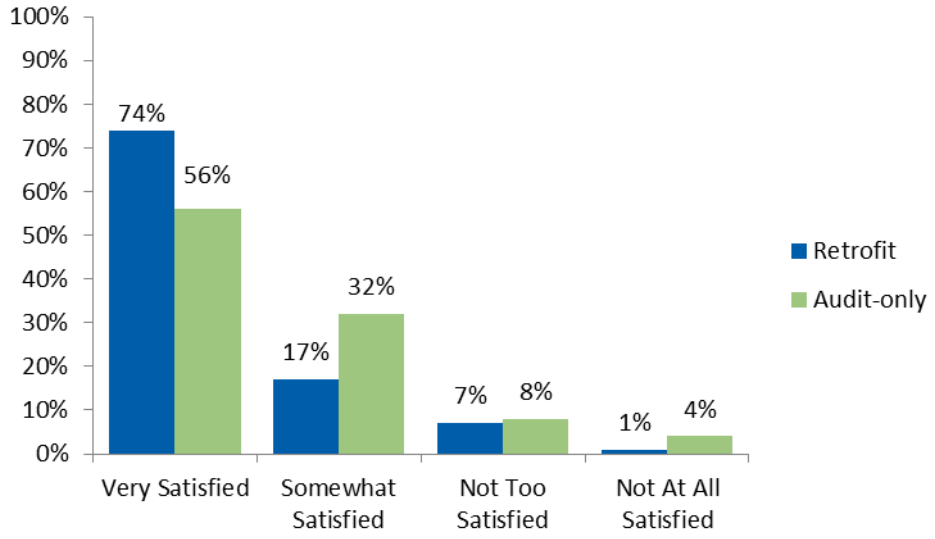
in their decision to make upgrades. Eighty-five percent (n=48) of audit-only customers received a written audit report, and 98% (n=41) of these found the report either "very useful" or "somewhat useful" in understanding their home energy use.

Satisfaction

The Evaluation Team asked both retrofit and audit-only participants about their satisfaction with specific Program components, such as the contractor's services and the Program overall.

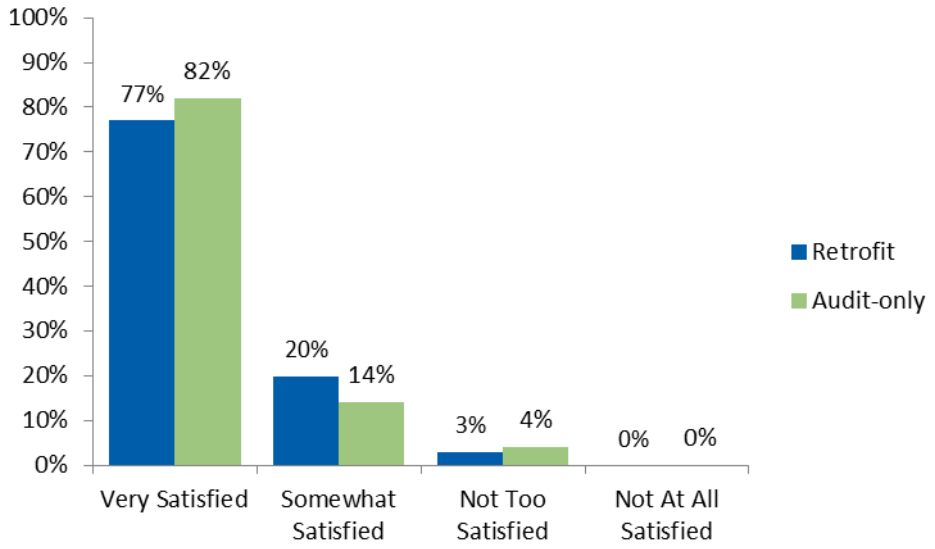
Both retrofit and audit-only participants expressed slightly lower levels of satisfaction with the contractor's ability to answer questions (knowledge) (Figure 73) than with the contractor's professionalism (Figure 74). Overall, retrofit participants were more satisfied with the Program than were audit-only participants (Figure 75).

Figure 73. Customer Satisfaction with Contractor Knowledge



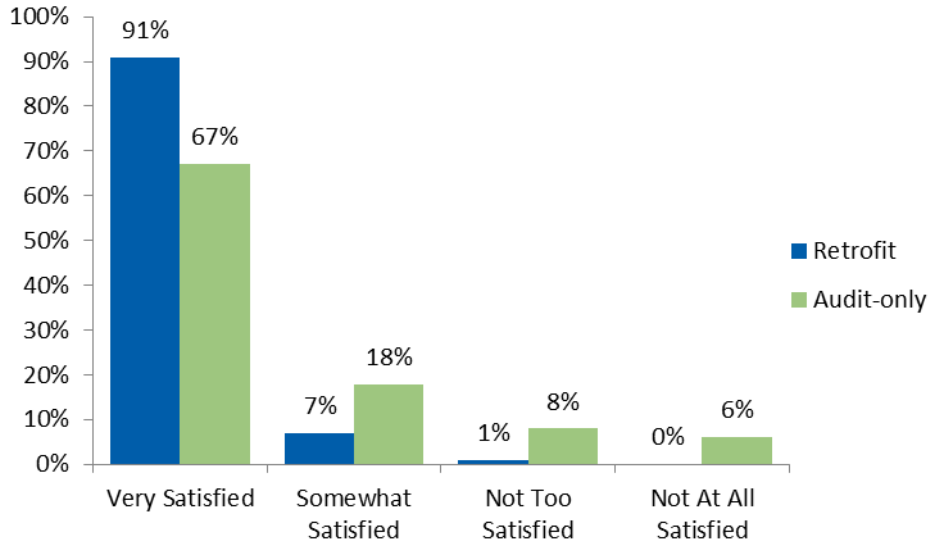
Source: Participant Survey and Audit-Only Participant Survey, Question QF2: "How satisfied were you with the contractor's ability to answer your questions?" (n≥49)

Figure 74. Customer Satisfaction with Contractor Professionalism



Source: Participant Survey and Audit-Only Participant Survey, Question QF3: "How satisfied were you with the contractor's professionalism and courtesy?" (n≥49)

Figure 75. Customer Satisfaction with the Program Overall

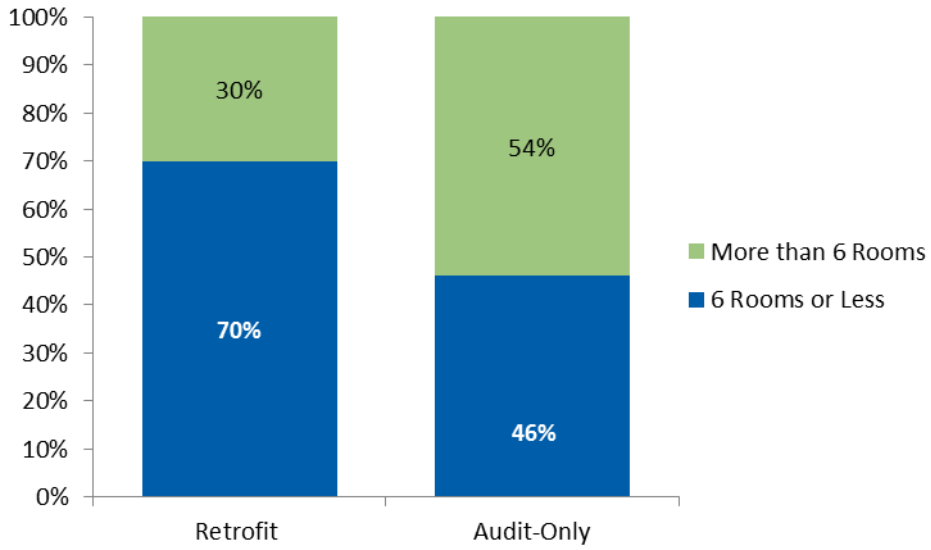


Source: Participant Survey and Audit-Only Participant Survey, Question QF6: "How satisfied were you with the program overall?" (n≥49)

Demographics

Most homes in the Program were older; 81% (n=70) of retrofit homes and 83% (n=50) of audit-only homes were built before the 1970s. Audit-only customers' homes averaged more rooms than retrofit customers' homes.

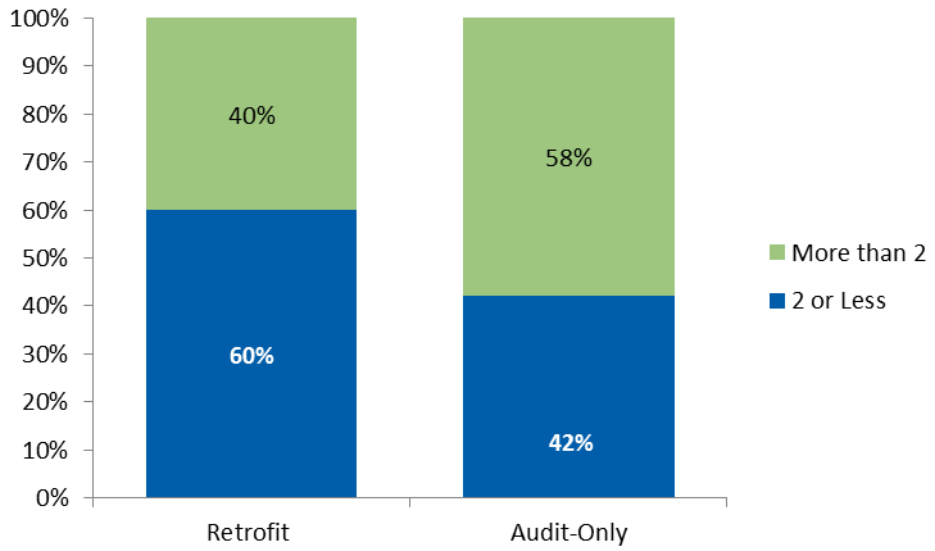
Figure 76. Number of Rooms per Home



Source: Participant Survey and Audit-Only Participant Survey, Question QJ7: "How many rooms are in your home, not counting bathrooms?" (n≥50)

Audit-only customers' homes have more residents than retrofit customers' homes (Figure 77). Audit-only customers were also less likely to be retired, with only 12% (n=50) retired compared to 26% (n=70) of retrofit participants.

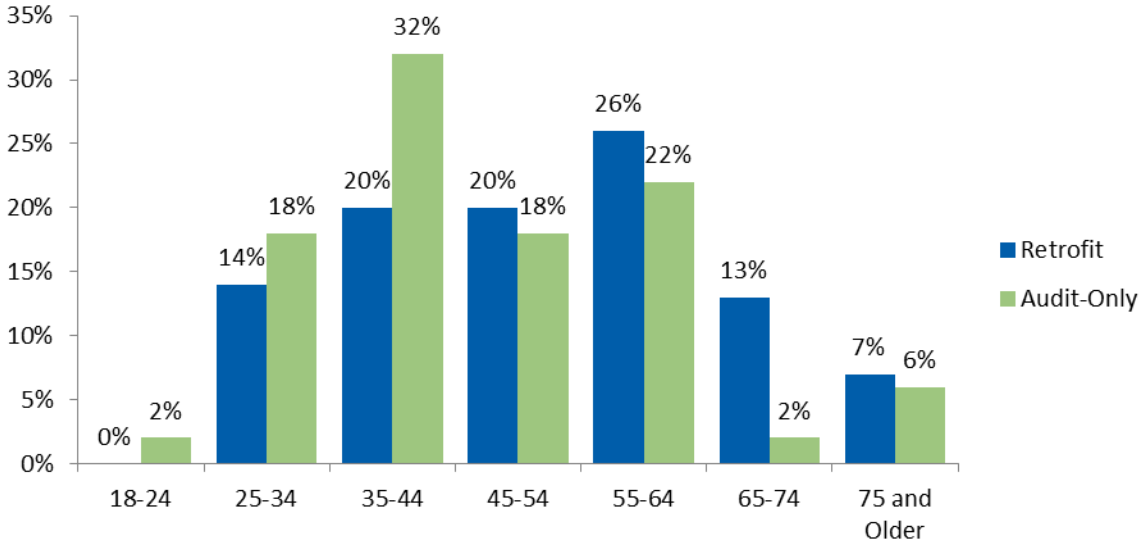
Figure 77. Number of People Living at Home



Source: Participant Survey and Audit-Only Participant Survey, Question QJ11: "including yourself, how many people live in your home on a full-time basis?" (n≥50)

Audit-only participants were younger than retrofit participants; nearly one-third were aged from 35 to 44 years old. Forty-six percent of retrofit participants were aged 55 or older.

Figure 78. Age Range of Participants



Source: Participant Survey and Audit-Only Participant Survey,
Question QJ14: "Which of the following categories best represents your age?" (n≥50)

Trade Ally Experience

The 38 Trade Allies who participated in the Assisted Home Performance Program were also eligible to participate with the Home Performance Program. The Evaluation Team interviewed 20 Trade Allies selected at random and discussed both programs in each interview. Responses on general topics are included in the Trade Ally Response discussion in the Home Performance Program chapter. This section includes responses specific to the Assisted Home Performance Program.

Of the Trade Allies interviewed for this evaluation, 16 did more work through the Home Performance Program than through the Assisted Home Performance Program. However, some of these Trade Allies still contributed a large number of Assisted Home Performance projects. One very active Trade Ally completed over 200 projects in 2013, 70 of which were through the Assisted Home Performance Program. Three Trade Allies said they did more work in the Assisted Home Performance Program than with the Home Performance Program.

Trade Allies gave varied responses when asked how they determined when to promote the Assisted Home Performance Program, but all responses could be grouped into the following five approaches:

- Told all their customers about Assisted Home Performance Program (3)
- Told some customers to look into it on their own, if Trade Ally perceives they may qualify, because the Trade Ally does not want to pry (6)
- Only mentioned it if the customer asks, because the Trade Ally feels the Program has fewer options, is less profitable, or is more confusing than the Home Performance Program (5)
- Never mentioned it, but respond to leads for customers that have been already been approved by the call center (3)
- Never mentioned it, assume customers do not qualify (income too high) (3)

The three Trade Allies who did work primarily through the Assisted Home Performance Program (rather than the Home Performance Program) were among the contractors who mentioned the Program only if they thought their customers might qualify. One of these mentioned it only to customers who could also benefit from the WPS bonus incentives. Two of these Trade Allies also limited their Home Performance Program promotion, the one because he thought it was confusing and the other because several of his clients were low-income and participated in the Weatherization Assistance Program.

When asked what they would change about the Program, two Trade Allies stated that the Assisted Home Performance Program does not pay as well as the Home Performance Program. Two said they would like the Program to add sill box and crawlspace insulation to the eligible measures because these are already available to “Reward Level 1” customers. Four Trade Allies wanted higher Program incentives.

One Trade Ally noted that it was not unusual to find customers who had no interest in moving forward but just “wanted the free light bulbs” from the audit. For these audit-only customers, the Trade Ally said

the $100 reimbursement was not enough to cover his costs to perform the audit. This was not a frequent complaint.

Two Trade Allies noted occasional language barriers when working with Assisted Home Performance Program customers, but did not specify the foreign language.

Program Cost-Effectiveness

Evaluators commonly use cost-effectiveness tests to compare the benefits and costs of a demand-side management program. The benefit/cost (B/C) test used in Wisconsin is a modified version of the total resource cost (TRC) test. Appendix I includes a description of the TRC test.

Table 88 lists the CY 2011-2013 incentive costs for the Assisted Home Performance with ENERGY STAR Program.

Table 88. Assisted Home Performance with ENERGY STAR Program Incentive Costs

	CY 2013	CY 2011-2013
Incentive Costs	$1,416,780	$3,562,831

The Evaluation Team found the CY 2013 Program to not be cost-effective (a TRC benefit/cost ratio above 1). Table 89 lists the evaluated costs and benefits.

Table 89. Assisted Home Performance with ENERGY STAR Program Costs and Benefits

Cost and Benefit Category	CY 2013	CY 2011-2013
Costs		
Administration Costs	$138,670	$107,100
Delivery Costs	$316,230	$244,236
Incremental Measure Costs	$1,373,644	$65,557
Total Non-Incentive Costs	$1,828,545	$416,894
Benefits		
Electric Benefits	$610,159	$6,815
Gas Benefits	$4,016,790	$36,664
Emissions Benefits	$822,850	$9,551
Total TRC Benefits	$5,449,799	$53,030
Net TRC Benefits	**$3,621,254**	**($363,864)**
TRC B/C Ratio	**2.98**	**0.13** [1]

[1] The cost-effectiveness ratio is for CY 2012 only.

Evaluation Outcomes and Recommendations

The Evaluation Team identified the following outcomes and recommendations to improve the Assisted Home Performance Program.

Outcome 1. The Program successfully navigated a surge in uptake without running out of funds.

Cross-marketing with the *Me*^{2} initiative led to a marked increase in interest and uptake of the Assisted Home Performance Program. Program Implementer staff worked with Program Administrator staff to obtain additional funding and increase goal targets.

Outcome 2. Contractors may not be as active in the income-qualified market as they are in the regular market because they feel they are less likely to make a sale, because there are fewer rebated measures, and because determining the customer's eligibility is a delicate conversation.

The Assisted Home Performance Program was designed to be contractor-driven, and indeed participants in the Home Performance Program most frequently reported they learned about the Program through their contractor. However, participants in the Assisted Home Performance Program indicated that they primarily learned about the Program from friends, family, and utility bill inserts.

The majority of Trade Allies reported that they did more work through Home Performance than through Assisted Home Performance. In addition, seventeen of 20 Trade Allies acknowledged they did not actively promote the Assisted Home Performance Program, because the income conversation was too delicate, because they assume their customers would not qualify, or because they feel they would make more money if they did not mention Assisted Home Performance.

Because Trade Allies reported being far less active in marketing to income-qualified customers, the Program may need to devise different delivery channels to reach its target population.

Recommendation 1. Segment marketing for Home Performance and Assisted Home Performance customers. Create print materials specifically targeting Assisted Home Performance customers. Deliver marketing through channels that rely on known, trusted messengers, such as the utility company, or on recommendations from friends or family. Find alternative delivery mechanisms for these Reward Level 2 materials, such as churches or additional utility mailings. Utilities, community action agencies, or other community groups may be able to provide Focus on Energy with segmentation data or lists of eligible customers. Meet with *Me*^{2} staff to learn how they marketed the initiative and whether or not these channels can be adapted to the Program. (Note this should be done as soon as possible, as the *Me*^{2} program may shut down due to lack of funds.)

Recommendation 2. Identify contractors willing to work in this market, and focus on them when launching new marketing initiatives for Reward Level 2. Some contractors reported working with low-income customers far more than other contractors. Any contractors who participated in *Me*^{2} may have gained valuable experience with this market. Identify the contractors who are interested in and have experience working with income-qualified customers and consult with them to create and launch targeted marketing materials. Provide these Trade Allies with additional training on how to use new materials.

Outcome 3. Customers report needing more and better information from Trade Allies.

Of all components of the Program, customers expressed the least satisfaction with the contractor's ability to answer their questions. While survey respondents did not specify any unanswered questions or indicate if they wanted technical or Program-related information, there may be at least some gap between customer expectations for information and what the trade allies are providing. This needs additional investigation to confirm and identify issues to be able to document this possible gap. Means of additional investigation include surveys and/or interviews with customers and Trade Allies.

Surveys also indicated that 19% of retrofit participants and 15% of audit-only participants did not receive a written audit report, which is a required component of the Program. This report could also answer customers' questions and be an easy reference for forgotten details.

Finally, some Trade Allies noted that they do not provide information about the Program to customers or only provide it if the customer asks. Some Trade Allies also reported that they may mention the Program, but would leave it up to the customer to go to the website and review the eligibility criteria.

Recommendation 3. Ensure Trade Allies are easily able to explain Program benefits—both financial and technical—to customers. In the training for new, targeted materials (Recommendation 2), incorporate a review of the benefits available for lower-income customers. Training should also address ways to help customers determine if they qualify for the Program, without simply abandoning them to review eligibility criteria online on their own. Include other topics that may be of particular interest and concern for low-income participants, such as tips for energy savings and information on other programs for low-income families, seniors, and groups that may overlap with low-come households.

Recommendation 4. Ensure Trade Allies deliver the audit report to participants and provide feedback on report layout and information. Establish a step in the Program's Quality Assurance protocol to ensure that the contractor is providing the written audit report to the customer. The protocol should make sure the contractor has completed all appropriate technical and Program information and made a copy for the customer. Ideally, reports should include results from the audit and describe recommended measures in simple language with estimated cost, payback, and available incentive amounts.

Trade Allies often have their own report formats that they prefer to use. However, some Trade Allies may not have developed a template, or they may not have one that looks attractive or works well. Consider providing all Trade Allies with a one-time review of their audit report template to recommend improvements. In addition, consider developing an audit report template that Trade Allies can use if they choose. Regardless, the Program should enforce that Trade Allies provide their customers with a written report.

Outcome 4. As with the Home Performance Program, retrofit homes in the Assisted Home Performance Program appear to be smaller than audit-only homes in the Assisted Home Performance Program.

This result was not unexpected, because the cost to insulate and air seal was directly proportional to the size of the house. This result could indicate that the existing incentive scale (based on percentage of cost, plus a savings bonus) may not be large enough to cover the added cost for larger homes.

Outcome 5. Young families are more likely to be audit-only customers.

Young families may have a lot of expenses to manage and little available time to work through complicated Program steps, which may explain why they were more likely to be audit-only participants than households with older, particularly retired, people.

Recommendation 5. Marketing materials should be targeted at the type of participant who is more likely to complete a retrofit, which includes older homeowners, and smaller homes. Consider targeting, and supporting Trade Allies to target customers who are more likely to engage in a retrofit after receiving an audit. While the per-audit cost was minimal for the Program ($100), there is a cost burden on Trade Allies for audits that do not convert to retrofits. Most Trade Allies perform both audits and retrofit work, and they prefer to focus on leads that are more likely to move forward after an audit.

Outcome 6. Federal grant programs, no longer in operation, were a major participation driver in CY 2013.

Anecdotal evidence indicates that *Me*^{2}, was important in driving CY 2013's increased participation. The Program Implementer perceived it to be a driver, Trade Allies mentioned they worked with *Me*^{2}, and customers reported a very different mode of entry into the Program—word of mouth—than anticipated by Program design, which could be explained by *Me*^{2} activity.

Recommendation 6. Consider a financing pilot directed to Reward Level 2 participants. Now that the federal grant programs in Milwaukee has ended, the Assisted Home Performance Program may experience a drop in participation in the coming year. Focus on Energy should consider launching a financing pilot to fill the void in the market left by the grant program, with a particular focus on the Reward Level 2 market. Program staff should meet with the *Me*^{2} and possibly the Green Madison staff to learn what aspects of the financing program were the most successful. The Evaluation Team has found that low-income financing can be successful, as low-income households do not necessarily have poor credit scores. To serve those that do have poor credit, alternative underwriting such as bill pay history may be an option, but would require a higher level of cooperation with the utilities.

Energy-efficiency financing programs are becoming more and more common across the country. They can be a more cost-effective tool for encouraging deeper participation in retrofit programs than increasing incentives. While it is difficult to quantify the degree to which a financing program increases

participation, most program managers consider that financing makes a difference, particularly in terms of the number of measures or savings level per retrofit.

In addition, several program managers have said that the combination of rebates and financing appears to be the best way to motivate the market. Focus on Energy may want to review the Michigan Saves Program, the Mass Save Heat Loan Program in Massachusetts, or the Manitoba Hydro Residential Loan Program may be useful program models.

The Evaluation Team recommends a program design that is based on offering a credit enhancement such as a loan loss reserve to a third-party lender (such as local credit union or specialized energy-efficiency lender like AFC First) and allowing the lender partner to manage all aspects of underwriting and servicing the loans. Any financing program should be offered as a pilot, perhaps in a limited area, and then expanded to serve the whole Focus on Energy territory if the pilot is successful.

New Homes Program

The Evaluation Team conducted both an impact evaluation and a process evaluation of the New Homes Program. The annual *ex post* verified total gross savings for CY 2013 are 3,543,042 kWh and 788,938 therms.

Focus on Energy delivers the New Homes Program to eligible homeowners throughout Wisconsin through a Program Implementer (Wisconsin Energy Conservation Corporation), participating homebuilders, and Building Performance Consultants. Home builders hire a Building Performance Consultant affiliated with the Program to guide them on better building techniques and to model and verify the new home's energy performance. The home builder typically receives Program incentives to help offset the cost of achieving one of four Focus on Energy New Home incentive levels.

The Program Administrator and Program Implementer did not make significant changes to the Program in CY 2013. Table 90 lists the Program's actual spending, savings, participation, and cost-effectiveness from CY 2011 through CY 2013.

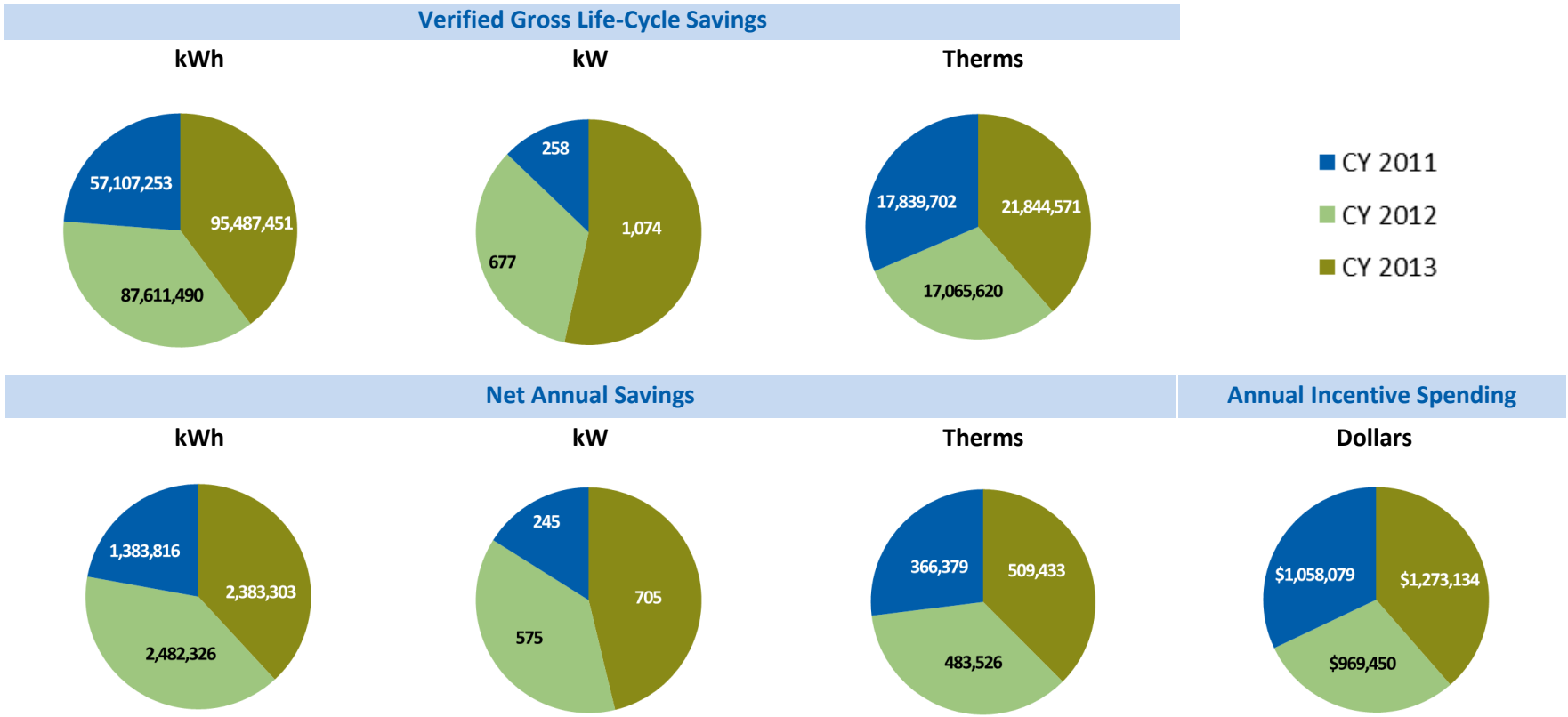
Table 90. New Homes Program Actuals Summary[1]

Item	Units	CY 2013 Actual Amount	CY 2011-13 Actual Amount
Incentive Spending	$	$ 1,273,134	$ 3,300,663
Verified Gross Life-Cycle Savings	kWh	95,487,451	240,206,194
	kW	1,074	2,009
	Therms	21,844,571	56,749,893
Net Annual Savings	kWh	2,383,303	6,249,445
	kW	705	1,525
	Therms	509,433	1,359,338
Participation	Homes	1,947	5,319
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	3.62	3.01 [2]

[1] This table presents gross life-cycle savings to allow comparison with Focus on Energy's quadrennial gross life-cycle savings target, and net annual savings to allow assessment of the Program Administrator and Program Implementer's achievement of net annual savings.
[2] The cost-effectiveness ratio is for CY 2012 only.

Figure 79 provides a summary of savings and spending in 2011, 2012, and 2013.

Figure 79. New Homes Program Three Year (2011-2013) Savings and Spending Progress



Measurement and Verification Approach

The Evaluation Team conducted impact and process evaluations for CY 2013. These key questions directed the Evaluation Team's design of the M&V approach:

- What are the Program savings?
- How can the Program increase its energy and demand savings?
- How well is the Program operating?
- How effective is the marketing strategy?
- What changes can increase Program awareness?
- What is the level of customer satisfaction with the Program?

The Evaluation Team designed its M&V approach to integrate multiple perspectives in assessing Program performance. Table 91 lists the specific data collection activities and sample sizes the Evaluation Team used to evaluate the Program.

Table 91. New Homes Program Data Collection Activities and Sample Sizes

Activity	CY 2013 Sample Size (n)	CY 2011-2013 Sample Size (n)
Program Database Review	Census (1,947 homes)	Census (5,319 homes)
Builder Survey	30	30
Participant Home Buyer Survey	15	15
Nonparticipant Home Buyer Survey	15	15
Participant Trade Ally Interviews	44	44
Stakeholder Interviews	2	6

Impact Evaluation

To calculate gross savings, the Evaluation Team reviewed tracking data in SPECTRUM, the Program database. To calculate net savings, the Evaluation Team used builder survey data to determine freeridership and spillover.

Evaluation of Gross Savings

Table 92 shows the overall tracked and verified gross energy impacts (kWh, kW, and therms) for the Program in CY 2013. The Evaluation Team reviewed the CY 2013 data contained in SPECTRUM for completeness and quality. The Evaluation Team used deemed assumptions and algorithms coupled with Program data to verify measure-level savings. All measures were nearly identical to the reported unit-energy savings, with the exception of a few data entry errors that resulted in differences between the reported savings and the records in SPECTRUM. The Program's renewable measures include ground source heat pumps, solar photovoltaic, and solar thermal.

Table 92. New Homes Program Gross Savings Summary

Savings Type	Gross			Verified Gross		
	kWh	kW	Therms	kWh	kW	Therms
Annual Renewables	477,988	61	2,564	477,988	61	2,564
Life-Cycle Renewables	8,929,994	61	53,053	8,929,994	61	53,053
Annual (without renewables)	3,065,054	1,013	786,374	3,065,054	1,013	786,374
Life-Cycle (without renewables)	86,557,457	1,013	21,791,518	86,557,457	1,013	21,791,518
Annual (inclusive of renewables)	**3,543,042**	**1,074**	**788,938**	**3,543,042**	**1,074**	**788,938**
Life-cycle (inclusive of renewables)	**95,487,451**	**1,074**	**21,844,571**	**95,487,451**	**1,074**	**21,844,571**

Tracking Database Review

The Evaluation Team reviewed the CY 2013 data contained in SPECTRUM for completeness and quality. With the exception of a few data entry errors that resulted in differences between the reported savings and the records in SPECTRUM, the Evaluation Team determined that all participating homes met the minimum requirements for both the percentage of savings and the number of measure packages (listed below) for the applicable incentive level.

The home builder receives an incentive based on the home's efficiency at one of four incentive levels, which are based on the Wisconsin Uniform Dwelling Code (UDC). During CY 2013, the UDC was equivalent to the 2006 International Energy Conservation Code (IECC). The four incentive levels are:

- Level 1 (10%-19.9% better than Wisconsin UDC)
- Level 2 (20%-29.9% better than Wisconsin UDC)
- Level 3 (30%-39.9% better than Wisconsin UDC)
- Level 4 (40% or more better than Wisconsin UDC)

This Program database tracks results from the certification work done by onsite contractors. These data include the MMBtu usage of the home and the percentage energy savings over the baseline home, which are based on results from the energy analysis modeling software (REM/Rate,™ developed by Architectural Energy Corporation).[23] This software is widely used in the residential new-construction industry to calculate energy use, code compliance, and efficiency rating. For the New Homes Program, Architectural Energy Corporation collaborated with the Program Implementer and the Program's technical director to create special baseline models and reporting tools in REM/Rate.

In early CY 2013, the Evaluation Team interviewed the Program's technical advisor and did a primary review of the specialized Program reports built into REM/Rate. Based on the review and the established

[23] REM/Rate produces a home energy rating report based on RESNET® National HERS Technical Standards.

credibility of REM/Rate software, the Evaluation Team found sufficient evidence for using it as a savings calculator and certification tool for the Program.

Table 93 lists incentives and participation for each CY 2013 incentive level for homes with electric and natural gas (Eligibility A) and homes with electric only (Eligibility B).

Table 93. CY 2013 New Homes Program Incentive and Participation by Level

Incentive Levels	Measure Packages Required	Incentive Eligibility A Electric and Natural Gas	Incentive Eligibility B Electric Only	Participation (A and B)	Percentage of Total Participation
Level 1	None Required	$200	$100	630	32%
Level 2	Any 2 Required	$750	$200	1,088	56%
Level 3	Any 3 Required	$1,000	$300	205	11%
Level 4	Any 4 Required	$1,500	$400	24	1%

Through the Program, Focus on Energy seeks to encourage and increase the market share of energy-efficient homes in Wisconsin by targeting builders as the primary market actors. Builders are required to work with Focus on Energy Building Performance Consultants who will mentor the builders on energy-efficiency practices that exceed the Wisconsin UDC by at least 10% and conduct onsite reviews of the home's performance at several building stages.

For a home to qualify for Focus on Energy incentives:

- The builder must hire a Building Performance Consultant to verify home eligibility throughout the building process.
- Building Performance Consultants must confirm the expected savings with building simulation modeling.

The Program has packages for both energy-efficiency technology and renewable-energy technology. The builder can install a specific number of energy efficiency technology packages to receive a larger incentive. The energy-efficiency technology package options are available to boost the energy-efficiency rating of the home. The savings from a renewable energy system does not count towards the certification level as the incentive is separate from the energy efficiency technologies. The Program's rewards are multi-tiered and performance-based and are intended to "ratchet up" reward levels and energy savings as more technology packages are chosen and implemented. The energy-efficiency technology packages offered are:

- **Lighting**
  - ENERGY STAR-qualified light bulbs (CFLs and LEDs)
  - ENERGY STAR-qualified light fixtures (CFLs and LEDs)

- **Building Shell**
  - Energy-efficient windows
  - Exterior above-grade wall insulation: R5 or greater
  - Rim and band joist spray foam insulation
- **Space Heating**
  - Furnace with an electronically commuted motor (ECM): 90% AFUE or greater
  - Gas Boiler: 90% AFUE or greater
- **Water Heating**
  - Indirect water heater
  - Tankless (0.82 EF or greater)
  - Storage: power-vented (0.67 EF or greater)
  - Storage: condensing (90% TE or greater)
  - Storage: electric (0.93 EF or greater)

The renewable-energy technology packages are (the savings from a renewable energy system does not count towards the certification level):

- Ground source heat pumps
- Solar water heating
- Solar photovoltaic

In addition, the Program offers a bonus for affordable housing that doubles the reward amount. Qualifying affordable housing agencies must have non-profit 501 (c)3 status or be a unit of local government.

In CY 2013, the Program's most popular technology packages were:

- Rim and joist spray insulation (31% adoption rate)
- Power vented storage water heaters (22% adoption rate)
- CFLs (20% adoption rate)
- Wall insulation (12% adoption rate)
- Furnaces (11% adoption rate)

All of the other technologies offered through the Program had very low (less than 1%) adoption rates.

The forecasted participation share for each incentive level proved to be highly accurate in CY 2013 (see Table 94). The majority of Program homes (88%) qualified for the two lowest efficiency tiers: Level 1 and Level 2.

Table 94. New Homes Program Participation by Level

Incentive Levels	Forecast	Actual
Level 1 (10%-19.9% better than code)	32%	32%
Level 2 (20%-29.9% better than code)	59%	56%
Level 3 (30-39.9% better than code)	8%	11%
Level 4 (40% or more better than code)	1%	1%

Realization Rates

In the SPECTRUM database, savings are generally assigned to the incentive level for each home. (That is, individual efficiency measures were not assigned savings but were aggregated at the whole-home level.) Thus, it was impossible for the Evaluation Team to apply a technology-specific realization rate. The exceptions to this limitation are the renewable energy systems.

The Evaluation Team verified that all of the gross savings reported in the tracking databases were achieved in accordance with the Program operating and evaluation criteria. These savings resulted in a realization rate of 100% for CY 2013, as shown in Table 95.

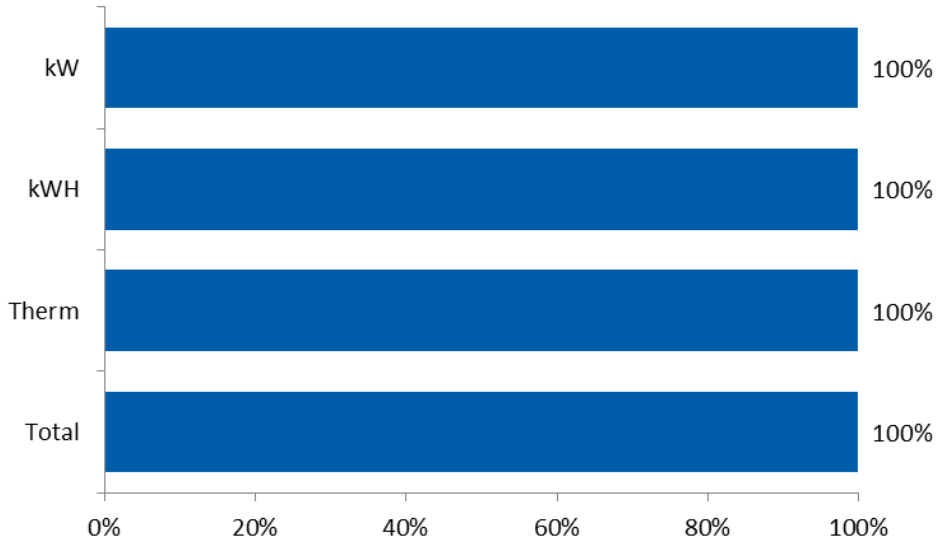
Table 95. New Homes Program Realization Rate

	Realization Rate
New Homes Program (overall)	100%
New Homes Renewables Measures	100%

The Evaluation Team notes that the practice of reporting savings for energy-efficiency measures at the home level does not facilitate an analysis of which measures are providing the most savings because any savings are assigned the same lifetime values (even though the technologies have different lifetimes).

Figure 80 shows the realization rate by fuel type.

Figure 80. New Homes Program Realization Rate by Fuel Type



Evaluation of Net Savings

Net-to-Gross Analysis

The Program evaluation required a different approach to assessing freeridership and spillover than other Focus on Energy residential programs because the builder, rather than the homeowner, is the decision-maker. The Evaluation Team surveyed participating builders to assess the net-to-gross ratio.

Since the Program includes multiple measures and not specific equipment, survey questions concerned the builders' sales of Focus on Energy-certified homes and the influence of the Program on the types of homes they built. Key questions were:

- In an average year, about how many homes do you build in Wisconsin?
- In 2013, what percentage of the homes you built were certified by Focus on Energy?
- Overall, how much influence did the Program, including the rebates, have on your decision to build Focus on Energy homes?
- If the Focus on Energy New Homes Program had not been available, would you still have built homes that would have qualified as Focus on Energy homes?
- If you would not have built homes to qualify as a Focus on Energy home, how would the homes you built have been different?

Freeridership Findings

To calculate freeridership, the Evaluation Team weighted each surveyed builder's freeridership score by the percentage of total homes in the sample that the builder represents (derived from Questions 4 and 5 in the builder survey).

Table 96 lists the questions and weighting the Evaluation Team used to calculate freeridership scores.

Table 96. New Homes Program Freeridership Weighting

Freeridership Score	How important is the Program in your decision to build energy-efficient homes?	If Focus on Energy did not offer the Program, would you build the same number of energy-efficient homes, fewer, or more?	If you would have built the same number of energy-efficient homes without the Program, to what standard would you build?
0%	Very important	Less	N/A
25%	Very important	Same	Lower (2006 IECC)
50%	Very important	Same	ENERGY STAR or other energy-efficiency certification
25%	Somewhat important	Less	N/A
50%	Somewhat important	Same	Lower (2006 IECC)
75%	Somewhat important	Same	ENERGY STAR or other energy-efficiency certification
50%	Not too important or not at all important	Less	N/A
75%	Not too important or not at all important	Same	Lower (2006 IECC)
100%	Not too important or not at all important	Same	ENERGY STAR or other energy-efficiency certification

This weighting method accounts for size differences between the interviewed builders and ensures that builders that constructed the most Focus on Energy homes contributed to the freeridership score more than firms that constructed the fewest Focus on Energy homes. The Evaluation Team used the following equation to calculate freeridership:

$$ParticipationWeightedFreeridership = \frac{\sum[Respondent\ Score] * [Respondent\ \#\ of\ Homes\ Built]}{[Total\ Homes\ All\ Respondents]}$$

Overall, the Program had an average freeridership of 35% across all respondents (see Appendix L for additional freeridership scoring details).

Spillover Findings

The Evaluation Team did not calculate spillover for the Program as the builders did not have a direct influence on the home buyers' decisions to purchase additional measures. Therefore, the Program spillover is assumed to be zero.

Net-to-Gross Ratio

Based on the freeridership and spillover results, the Program net-to-gross ratio can be calculated as:

$$NTG = 1 - Freeridership\ Ratio$$

From another perspective (but with the same result), net-to-gross can be described as the ratio of net savings to verified gross savings. The evaluated freeridership of 35% and spillover of 0% generates an overall 65% net-to-gross ratio for the Program, as shown in Table 97. The 85% net-to-gross that was applied in the CY 2012 evaluation was based on the Program Implementer's planning assumptions, while the CY 2013 value is based on current evaluation research.

In accordance with the evaluation criteria established in the Program-specific evaluation plan (and accepted by the Evaluation Work Group and the Wisconsin PSC), the Evaluation Team applied a 0.85 net-to-gross value for the Program's renewables measures.

Table 97. New Homes Program Net-To-Gross Ratios

	Net-To-Gross Ratio
New Homes Renewables Measures	85%
New Homes Non-Renewables Measures	65%
New Homes Program (overall weighted average)	**65%**

Net Savings Results

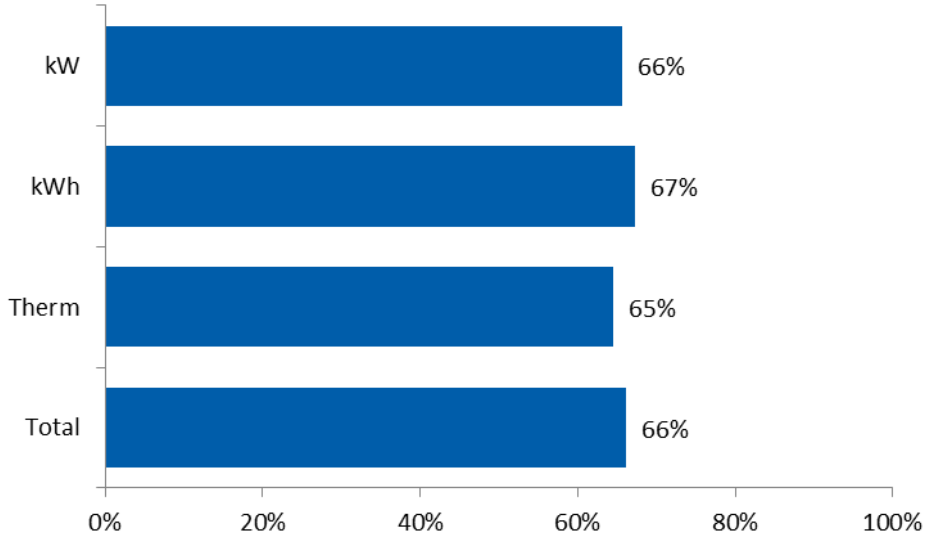
Table 98 shows the net energy impacts (kWh, kW, and therms) for the CY 2013 Program. The Evaluation Team attributed these savings net of what would have occurred without the Program.

Table 98. New Homes Program Net Savings

Verified Net			
Savings Type	**kWh**	**kW**	**Therms**
Annual	2,383,303	705	509,433
Life-Cycle	63,453,963	705	14,100,631

Figure 81 shows the net savings as a percentage of the *ex ante* gross savings by fuel type.

Figure 81. New Homes Program Net Savings as a Percentage of *Ex Ante* Savings by Fuel Type



Process Evaluation

The Evaluation Team conducted interviews with these Program stakeholders and market actors:

- Program Administrator and Program Implementer staff
- Participating builders
- Participating and nonparticipating Building Performance Consultants
- Buyers of Program-certified and non-Program new homes

The Evaluation Team used the results of these interviews to evaluate Program performance, opportunities for improvements, Program awareness, and influence on home buyer decision-making, builder satisfaction and to follow up on issues identified in prior evaluations. Key recommendations from the CY 2012 evaluation were:

- Streamlining data collection into one database
- Expanding marketing efforts to home buyers
- Enhance written resources for Building Performance Consultants and builders as the Program expands

Program Design, History, and Goals

The Program has been a part of the Focus on Energy residential segment offering since 1999. Focus on Energy designed the Program to encourage builders to use energy-efficiency best practices in residential new construction. In previous years, Focus on Energy based the Program design on ENERGY STAR standards, but it developed new standards in CY 2011 after statewide market actors raised concerns

about ENERGY STAR Version 3. The Program Administrator and Program Implementer made no Program design changes in CY 2013.

In CY 2013, Program Implementer staff reported that the Program benefited from the gradual recovery in Wisconsin's building market, but they noted that a statewide shortage of skilled construction labor limited the number of new homes constructed. During CY 2013, homes that once took three months to build took six to nine months because of the post-recession labor shortage.

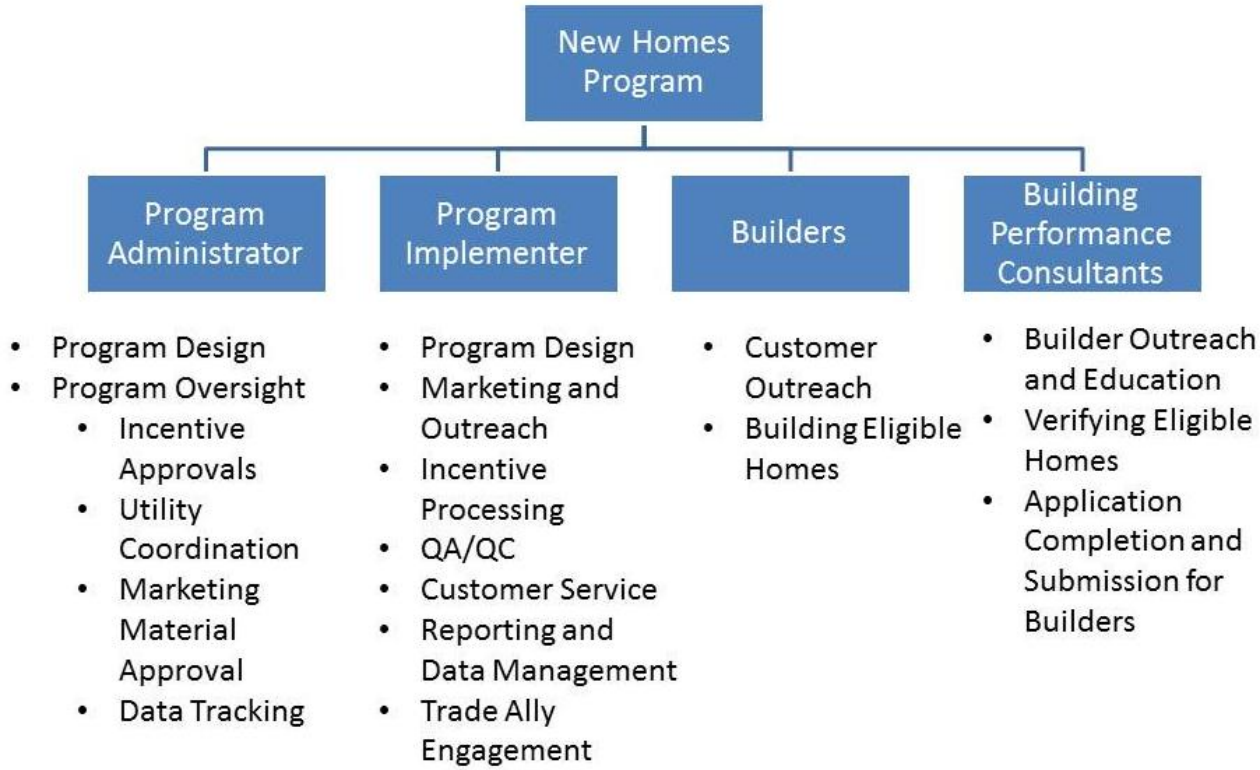
Program Management and Delivery

This section describes the Evaluation Team's assessment of the various Program management and delivery aspects.

Management and Delivery Structure

Under the Program Implementer's guidance and training, approximately 38 Building Performance Consultants advised more than 228 builders on the construction of Program-qualifying homes. Figure 82 shows a diagram of the key Program actors.

Figure 82. New Homes Program Key Program Actors and Roles



Focus on Energy designed the Program so that the Building Performance Consultants provide builders with the skills and knowledge required to build energy-efficient homes that will lead to market transformation.

The Implementer trains the Building Performance Consultants to be the Program's energy-efficiency experts. They then recruit and develop partnerships with builders, providing education and oversight on building homes that qualify for the Program. Builders contract with Building Performance Consultants for their services. Builders, in turn, market their Program-qualifying homes to prospective home buyers.

In order to participate, Builders must complete an online Focus on Energy Trade Ally application. Implementer staff reported that builders have expressed frustration with the online application process in the past. According to the Implementer staff, several new builders indicated that they completed the on-line application several times and never received a confirmation email as promised on the application. The Implementer is particularly concerned that the Program may have lost new builders because they became so frustrated with the online application that they simply gave up trying to become a Program builder.

Also, because the system does not have the designated field to indicate which Building Performance Consultant the builder works with, he or she must e-mail the information to the Program Implementer.

The Program also offers an additional incentive to builders who construct affordable housing units in partnership with approved 501 (c)3 affordable housing agencies such as Wisconsin Habitat for Humanity affiliates and the Milwaukee Housing Authority.

Program Data Management and Reporting

The Evaluation Team found that the Program Implementer captured all Program-required data in a comprehensive Microsoft® Excel workbook.

Building Performance Consultants collect and submit data for Program-qualified homes from a minimum of two required site visits. The data collection process involves several steps. The Building Performance Consultant:

- Receives the architectural plans from the builder.
- Extracts data based on the plans and enters it into the Excel workbook and REM/Rate.
- May then provide the builder with recommendations to ensure the home will meet all Program requirements and may suggest areas of improvement to boost the home's likely incentive level.
- Once insulation is installed, conducts an insulation installation and framing review, enters additional data into Excel, and updates the REM/Rate file.
- Once the home is completed, performs a second onsite performance test of air tightness and ventilation capacity (as appropriate) and confirms that the builder met Program standards.
- Submits Excel sheet and the REM/Rate file to the Program Implementer for certification.

The Evaluation Team interviewed 10 Building Performance Consultants. Eight of the respondents reported that the Program project applications involved duplication of work because several required data fields in REM/Rate were also required in the Program's Excel sheet. They reported that these data entry duplication was a burden and took unnecessary time.

Additionally, nine respondents said they recorded data by hand and later entered these data into Excel. Three of ten Building Performance Consultants suggested the Program Implementer delete these duplicate data fields in Excel and create a tablet application for onsite data entry so they could eliminate recording data on paper.

New Homes Program Marketing and Outreach

Target Audiences

The Program consists of two target audiences: home builders and home buyers. Builders serve as the primary Program marketers to buyers, and Building Performance Consultants serve as the primary Program marketers to builders.

These marketing materials were available to increase awareness of the CY 2013 Program:

- Focus on Energy website
- *Sense of Place* brochure for home buyers
- *Build Better Homes* brochure for builders
- *Building the Dream* fact sheet
- Building standards fact sheet for general audience
- Focus on Energy plaque for a Program-certified home's electrical box
- Focus on Energy Yard Sign
- Template Ad 1
- Template Ad 2
- Homeowner Testimonial
- Table-top partner sign

The Program Implementer estimated that the Program comprises from 20% to 30% of the new home market statewide. By reviewing Wisconsin Builders Association data, the Evaluation Team determined that the Program's participation market share is again 26%.[24]

[24] Wisconsin Builders Association (WBA). http://www.wisbuild.org/site/publisher/files/Housing%20Starts/2013/Jan-Dec%202013%20Housing%20Permits.pdf

Marketing to Builders

In CY 2013, the Program operated as designed: Implementer staff recruited Building Performance Consultants and they recruited builders to participate in the Program. No new Building Performance Consultants joined the Program in CY 2013, but 62 new builders did.

While Implementer staff conducted outreach to home builder associations, building suppliers and various home shows around the state, mentoring and educating the Building Performance Consultants provided to new builders was the Program's most influential recruitment tool.

Historically, Focus on Energy has paid for the Program's membership in each of Wisconsin's 24 home builder associations (approximately $13,000 a year in total). During the CY 2013 interviews, Implementer staff reported that these memberships were not bringing in many builders, therefore they were reconsidering this allocation. Implementer staff also reported that, over the last few years, the builder associations did not seem to be as active as they had been previously.

Implementer staff provides Program brochures to registered builders for their reference and distribution to home buyers. Implementer staff also informs builders of the cooperative advertising reimbursement—builders can use Program logos in their marketing materials and, upon approval of the collateral, can then submit receipts to reimburse up to $2,000 in materials costs. In CY 2013, Implementer staff reported that builders did not use the reimbursement as much as anticipated, but they lacked feedback from builders to understand why. The Trade Ally Experience section discussed the cooperative advertising reimbursement in more detail.

Marketing to Home Buyers

Builders are supposed to market the Program to home buyers by distributing brochures and educating buyers on a Program-certified home's features. Nine of 20 builders said they only build Program homes, while six of 10 builders who build Program and non-Program homes said they did not market their Program homes any differently than their other homes. Builders said this was, in part, because they already used energy-efficient building practices on all of their homes, even when they elected not to seek Program certification or incentives.

Without verifying non-Program homes, the Evaluation Team was unable to confirm if builders use energy-efficient practices that match Program efficiency levels or if they use some, but not all, of the energy-efficient practices incented by the Program.

Implementer staff reported that Building Performance Consultants and builders requested more substantive Program marketing efforts, particularly with the expectation that Implementer staff would conduct more mass advertising. Historically, the Program budget has not accommodated marketing efforts beyond printing and updates to existing brochures and fact sheets. Implementer staff said they would like to allocate more funds for marketing to the home buyer population.

The Program Administrator and Program Implementer did not track marketing metrics formally. Rather, they relied on builders and Building Performance Consultants to ask customers how they learned about the Program.

Energy-Efficient Mortgage Program

Up until midyear CY 2013, Focus on Energy maintained a partnership with North Shore Bank, which offered mortgages to buyers of energy-efficient Program-certified homes. The bank offered a reduced down payment and a reduced interest rate and accepted a higher debt-to-income ratio. This partnership dissolved due to the departure of a key Program ally at the bank.

As is true for many new home and home-retrofit programs that offer an energy-efficient loan or mortgage, the financial product did not drive participation on its own. Implementer staff has been discussing the possibility of working with the same individual to champion a similar program at his new place of employment, Bank Mutual.

None of the participant home buyers interviewed reported using or being aware of the energy-efficient mortgage offered by North Shore Bank. The Evaluation Team notes that while the bank offered the mortgage statewide, its retail locations are in the Green Bay and Milwaukee areas, and the responding home buyers came from communities throughout the state. Bank Mutual, the new energy-efficient mortgage partner, has locations around the state.

Customer Experience

The Evaluation Team surveyed new home buyers—15 Program participants and 15 nonparticipants—on topics such as satisfaction with their new home, awareness of the Program, and influences on their purchase decisions. Unlike other Focus on Energy residential programs the builder, rather than the homeowner, is the decision-maker. As such the builder survey assessed freeridership and spillover; the customer survey addresses Program satisfaction, awareness, and influence.

Satisfaction

All of the Program home purchasers reported satisfaction with their new home's features and said they were likely to recommend the Program to a friend. The majority of participants that provided a response to this question (11 of 13) reported they were "very satisfied" with their new home's energy-efficiency features,[25] and two of the 13 responded they were "somewhat satisfied."

Participants thought Focus on Energy homes offered greater comfort and quality than standard homes. Eleven of 15 participants "strongly" or "somewhat" agreed with the statement that Focus on Energy

[25] Participant and nonparticipant home buyer population numbers fluctuate due to responses of "refused" or "don't know."

homes are more comfortable than standard homes. Fourteen agreed that Focus on Energy homes provide additional quality and lower energy bills. One respondent declined to comment.

Overall, Program home buyers reported satisfaction with their new homes. Only three offered suggestions for improving the Program. All three said the builders should emphasize the Program more and spend more time educating customers about the Program early in the purchasing process.

For example, one participant wanted to learn more about Program details, saying, "It wasn't clear which features the builder was installing that were directly tied to the New Homes Program or what differentiated this from other certifications. I'd like to understand that." Another participant said, "Builders who participate in it should talk more about the Program and what the standards are." A third participant would have appreciated "more emphasis from the builder about Focus on Energy up front."

Awareness

Both participants and nonparticipants exhibited awareness about Focus on Energy in general and the Program in particular. All 15 participant respondents and nine of the 15 nonparticipants reported being aware of the Focus on Energy New Homes Program certification.

Only four participants recalled how they heard about Focus on Energy (in general) and cited these sources:

- Television (two respondents)
- Print media (one respondent)
- "I've just known about it forever" (one respondent)

Four of 15 participants reported awareness of other Focus on Energy programs, such as the Appliance Recycling and Residential Rewards Programs. None had participated in other Focus on Energy programs.

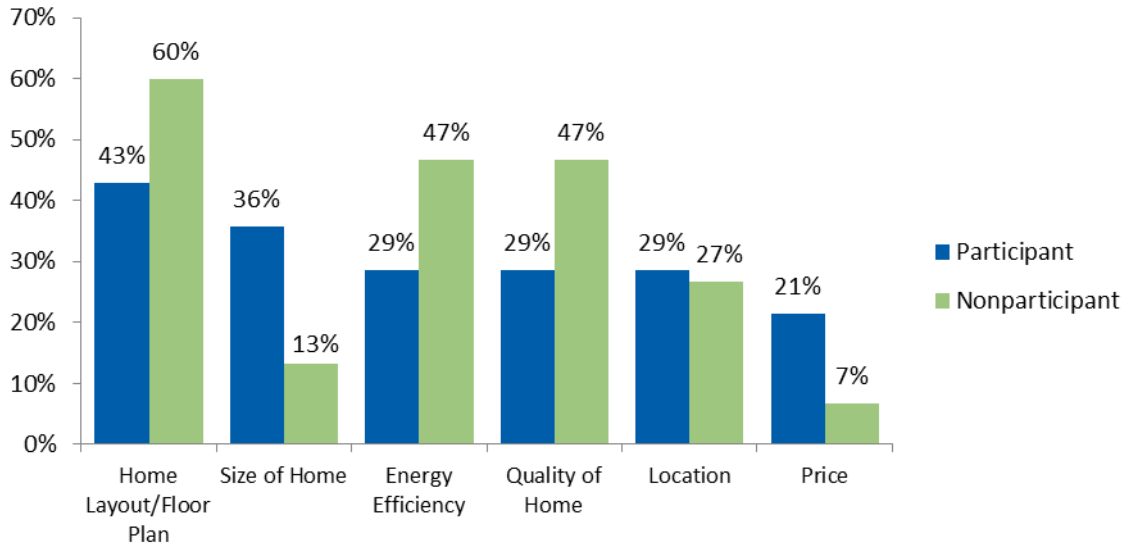
Participants did not know about the Focus on Energy New Homes Program prior to looking for a new home. Only one of 15 participants claimed to have learned about it before starting the home search. A majority (11 of 15) said they learned about the Focus on Energy New Home certification at some point during the home search. Three of the 15 participants said they learned about the certification after they purchased the home.

Builders represent a key source of information about a home's Focus on Energy status. A majority (nine of 15) of the participants reported that they learned their home was a Focus on Energy-certified home from their builder. Six of 15 said they received a letter from Focus on Energy recognizing their home as a Program home, and one participant learned about the certification because of a plaque or label on the home. (Multiple responses were allowed for the questions about Program awareness).

Path to Purchase

Participants and nonparticipants considered similar aspects as most important in their home search, such as home layout, size, and energy efficiency. As shown in Figure 83, nonparticipants ranked home layout, energy efficiency, and quality of home as the most important aspects; however, participants ranked the home layout and size as most important and location, energy efficiency, and quality of home as slightly less important. All 15 nonparticipants reported that the new home they purchased was energy efficient, although none of their homes had energy-efficient certification.

Figure 83. New Homes Program Path to Purchase: Most Important Aspects Considered



Source: Participant Home Buyer Survey (D3) and Nonparticipant Home Buyer Survey (C3).
"When looking for a new home, what were the most important aspects that you considered?"
(Participant, n≥14; Nonparticipant, n≥15; Multiple responses allowed)

Participants relied on builders more than any other source for information throughout the home-buying process. Figure 84 shows that 11 of 13 participants that provided a response (85%), compared to five of 14 nonparticipants (36%), relied upon information from their builder in making their purchase decision. Eight of nine participants reported that the builder was “very” or “somewhat” important in their decision to buy a specific home, and six of nine participants said that their builder was “very” or “somewhat” knowledgeable about the Focus on Energy certification.

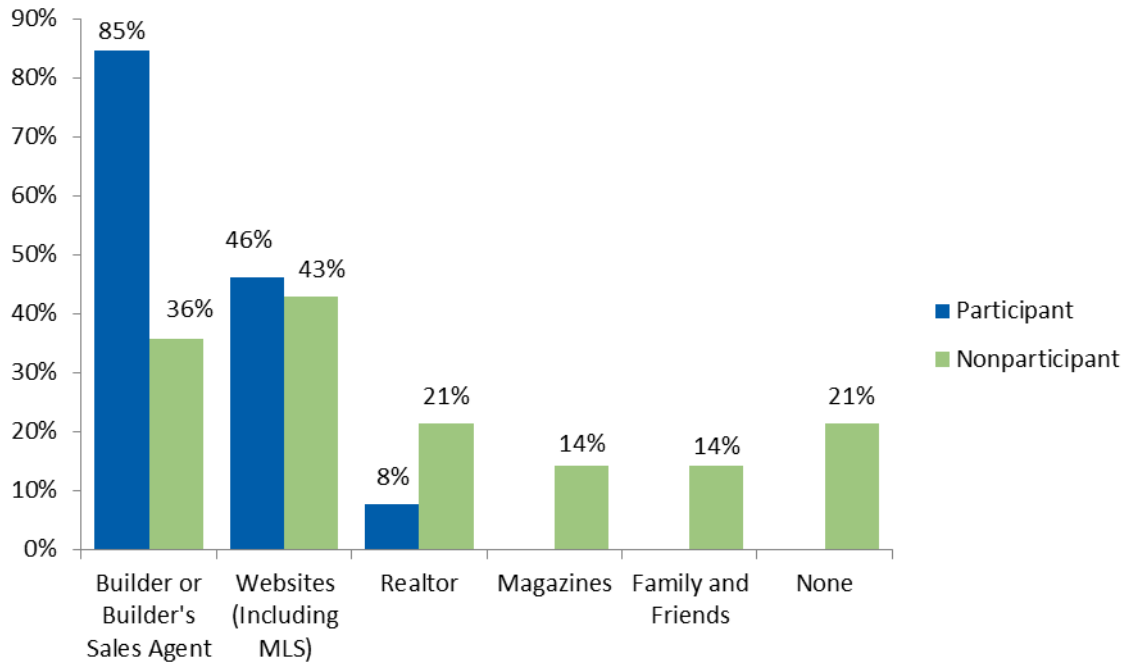
Nonparticipants also indicated that builders were more influential than any other party in their decision to buy their specific home; 11 of 15 nonparticipants said the builder was “very” or “somewhat” important in their decision.

Realtors played a lesser role than builders in the home-selection process for participants and nonparticipants, but more nonparticipants used realtors. Only three of 11 participants used a realtor to

assist in their home-buying process. A greater number of nonparticipants used realtors, consulted magazines and print publications, and conferred with family and friends for information during their home search. All 15 nonparticipants said the realtor was "not too important" or "not at all important" in their decision to buy their specific home.

Participants and nonparticipants also relied upon websites, including the Multiple Listing Service (MLS), as sources of information in their home search.

Figure 84. New Homes Program Home Buyer Sources of Information



Source: Participant Home Buyer Survey (B3) and Nonparticipant Home Buyer Survey (C4).
"What sources of information did you rely on when looking to buy your new home?"
(Participant, n≥13; Nonparticipant, n≥14; Multiple responses allowed)

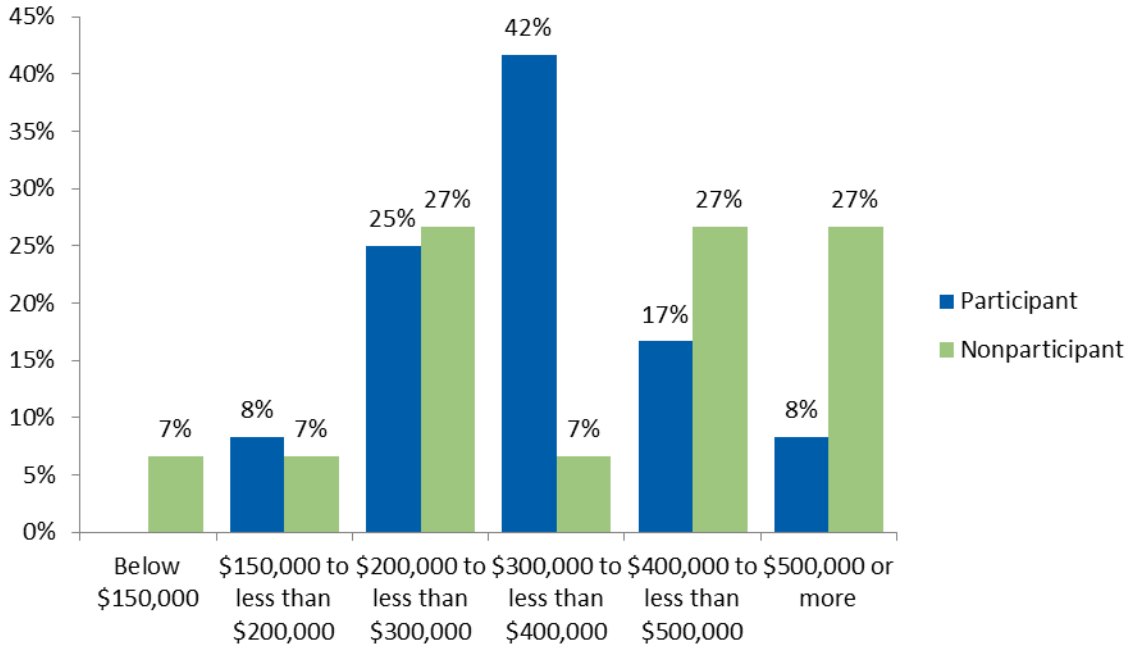
Demographics

The survey found that Program participants tended to live in homes valued at over $300,000 and with square footage greater than 2,500. In addition, participants tended to be:

- Between ages 25 and 44
- Have annual income between $100,000 and $200,000
- Have a graduate or professional degree

As depicted in Figure 85, five of the 12 participants interviewed purchased a Program home that cost between $300,000 and $400,000. Three of 15 nonparticipants built their own home.

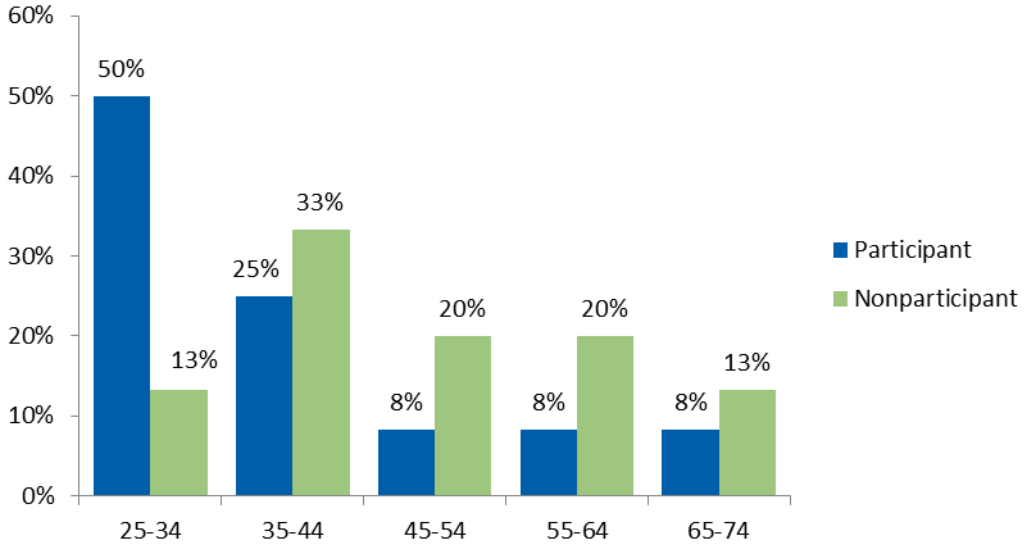
Figure 85. New Homes Program Cost of Home



Source: Participant Home Buyer Survey (G1) and Nonparticipant Home Buyer Survey (H2). "Approximately how much did your home cost?" (Participant, n≥12; Nonparticipant, n≥15)

Although the difference is not statistically significant due to small sample sizes, interviewed participant and nonparticipant home buyers represented different age groups, as shown in Figure 86. Participant home buyers were younger than nonparticipants.

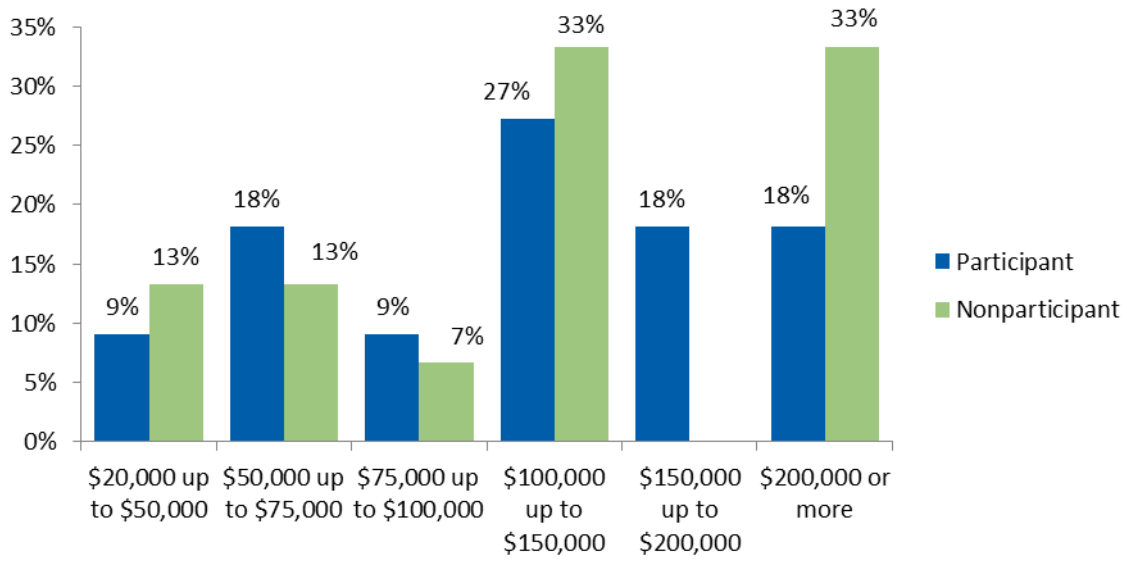
Figure 86. New Homes Program Home Buyer Age



Source: Participant Home Buyer Survey (K2) and Nonparticipant Home Buyer Survey (H3).
"Which of the following categories best represents your age?"
(Participant, n≥12; Nonparticipant, n≥15)

Home buyer income was similar between participants and nonparticipants (see Figure 87).

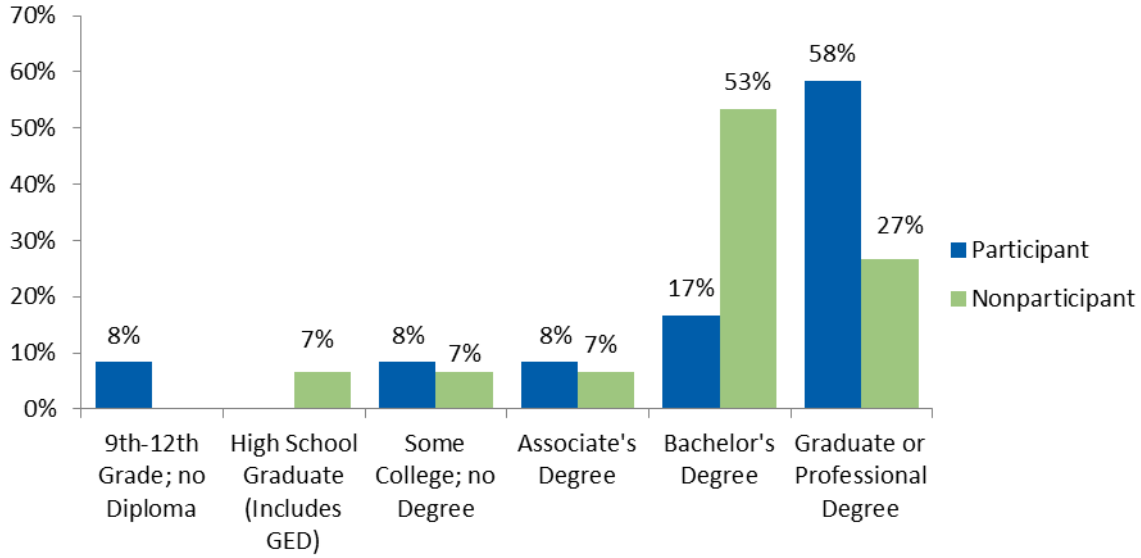
Figure 87. New Homes Program Home Buyer Income



Source: Participant Home Buyer Survey (K4) and Nonparticipant Home Buyer Survey (H5).
"Which category best represents your total household income in 2012 before taxes?"
(Participant, n≥11; Nonparticipant, n≥15)

As shown in Figure 88, the interviewed participants were highly educated; the majority (seven of 12) had a graduate or professional degree. The majority of interviewed nonparticipants (eight of 15) had a bachelor's degree.

Figure 88. New Homes Program Home Buyer Level of Education



Source: Participant Home Buyer Survey (K3) and Nonparticipant Home Buyer Survey (H4): "What is the highest level of school that someone in your home has achieved?" (Participant, n≥12; Nonparticipant, n≥15)

Trade Ally Experience

The Evaluation Team interviewed participant builders and participant and nonparticipant Building Performance Consultants on topics such as reasons for participation, observations about customer awareness, changes in the Wisconsin building market, and challenges encountered.

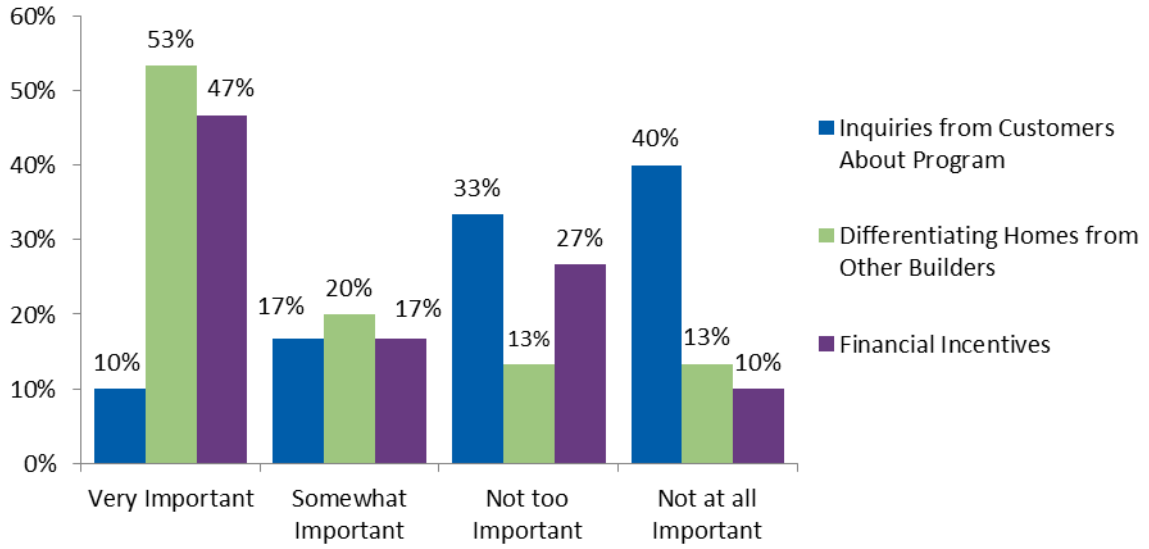
Builders

The Evaluation Team interviewed 30 participant builders about their Program experience.

Reasons for Participation

Builders elected to participate in the Program for a variety of reasons, but they cited the financial incentives and the ability to differentiate their homes from other builders' as the most important reasons (see Figure 89). Two-thirds noted that customer inquiries about the Program were not important in their participation decision.

Figure 89. Influences on New Homes Program Participation



Source: Participant Builder Interviews. "How important were inquiries from customers regarding the Focus on Energy Program in your decision to participate?", "How important was the opportunity to differentiate your homes from other builders' homes in your decision to participate?", "How important were the Program's monetary incentives in your decision to participate?" (n≥30)

On average, participating builders construct 85% of their homes to the Focus on Energy standard. Seventy percent construct all of their homes to Focus on Energy standards. Builders who do not build all of their homes to Focus on Energy standards reported that in those situations the customer either did not want to pay for the certification or the customer chose a new home design, such as a log cabin, that might not qualify for the Program.

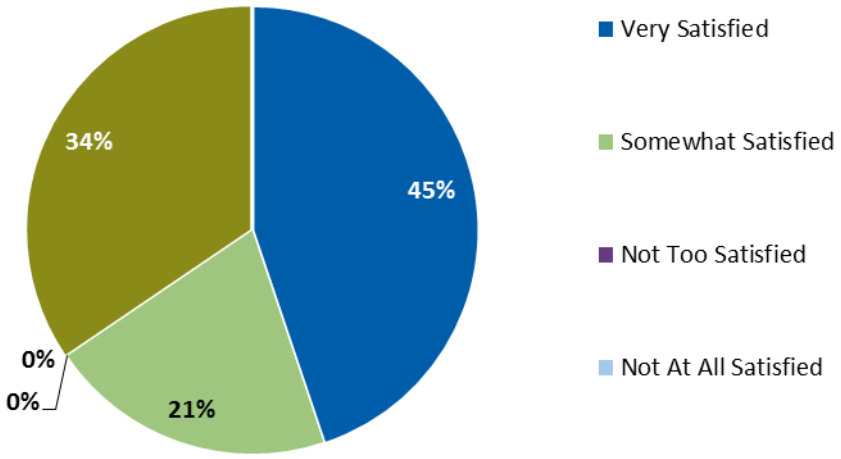
Satisfaction

Builders reported satisfaction with the Program, their interactions with Focus on Energy New Homes Administrator staff and Implementer staff, and the Building Performance Consultants with whom they work. Builders said they appreciated the Building Performance Consultant as a partner in building, that the Program made them a better builder, and that the Program pushes the envelope with energy efficiency. *"It's meaningful and attainable,"* said one builder.

As depicted in Figure 90, nearly half the builders were "very satisfied" with their communication with Administrator staff and Implementer staff. These builders noted the following about Implementer staff:

- "I can call up Joe or Andy at any time and they'll find the answer. Joe will even visit homes."
- "Staff puts out great info; really seem to stay on top of new technology and building science."
- "They keep me up to date."

Figure 90. Satisfaction with New Homes Program Communication



Source: Participant Builder Interviews. "How satisfied are you with your communication with Wisconsin Energy Conservation Corporation and Focus on Energy staff?" (n≥29)

Builders said that they received e-mail updates from Implementer staff and phone calls for more important Program information. One-third of the builders said that they communicated directly with their Building Performance Consultant about Program matters, not with Implementer staff. Builders who indicated they were "somewhat satisfied" with communication reported a long approval process, lack of information in previous years, and the need for shorter e-mails. A few builders identified the following areas for improvement:

- Builders would prefer more frequent and regular communication (two builders)
- Program seems like it may not reach out to small builders (two builders)
- Send hard copy mailings in addition to e-mails for the most important communications (two builders)

Most builders said they received Program training from their Building Performance Consultant. Seven of 30 builders said they attended Program training from the Program Implementer, and all were "very" or "somewhat" satisfied with the training. One of those builders appreciated options for getting more building education, but said he would have preferred extensive training on many topics. Another builder would have liked to receive training on spray-foam technologies, especially for attic and wall-sealing applications, and on air-handling technologies.

Builders reported satisfaction with their interactions with their Building Performance Consultant, noting they are generally very responsive and very knowledgeable. Many builders viewed the Building Performance Consultant as a business partner who helped them do a better job. The majority (26 of 30)

of builders said they were "very satisfied" with their Building Performance Consultant. Three of 30 were "somewhat satisfied," and one of 30 was "not too satisfied." The builder who said he was "not too satisfied" noted his Building Performance Consultant always made the same suggestions. Builders identified the following attributes of their Building Performance Consultants:

- "The whole process is great. Builder and Building Performance Consultant are a team."
- "Great attention to detail."
- "Constantly pushing us."
- "Helps me resolve issues."
- "He's practical and balances what is going too far in terms of a long payback time."
- "He knows me and my business and my methods."

Very few builders said that their Building Performance Consultant needed to improve performance. Two builders said their Building Performance Consultants could not explain the Program incentive structure, and one builder thought two visits from the Building Performance Consultant was too much and indicated an inefficient and inconvenient Program process.

Cooperative Advertising Reimbursement

Builders reported awareness of the Program's cooperative advertising reimbursement. Most builders (26 of 29) had heard about the reimbursement. Thirteen of 29 builders interviewed used the reimbursement in the past; however, many of those builders had not used it since 2011, when the Program followed ENERGY STAR guidelines, or had another employee handle it. Two of 11 builders were "very satisfied" with the cooperative advertising reimbursement. Eight of 11 were "somewhat satisfied," and one of 11 was "not too satisfied." Builders made the following comments:

- "It takes too long. Make it simpler."
- "Increase the [$2,000] cap."
- "My office manager deals with it. It took a long time because the requirements are lengthy. It used to be easy but now it isn't."
- "It would be nice if there was a place on the web or someone to contact to let builders know how much they have left for advertising as well as example advertising."

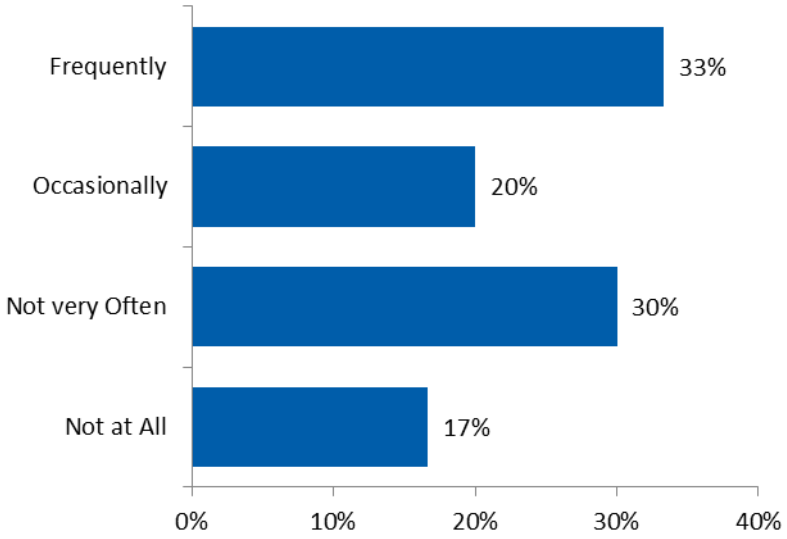
Customer Observations

Builders reported different perceptions regarding customer awareness of the Program. While half of builders interviewed said that very few of their customers knew about the Program, the other half noted that most if not all of their customers were familiar with the Program. In general, builders said that about half of their customers had heard about the Program before they discussed it in greater detail and that Program awareness was higher among metropolitan area customers than among rural customers.

The responding builders agreed that home buyers were more aware and more interested in energy efficiency than they were even a few years ago. Builders said that buyers they worked with were more knowledgeable about energy efficiency, expected new homes to be energy-efficient, and were more conscious about saving money even when natural gas prices are low.

However, when asked how often customers asked about energy efficiency when visiting model homes or planning the design of a new home, builders' responses varied. As depicted in Figure 91, one-third (10 of 30) of builders said that buyers asked "frequently" about energy efficiency, and one-third (nine of 30) said that buyers do not ask "very often." Two builders said that customers who noticed Focus on Energy marketing materials at a builder's office tended to inquire about the Program.

Figure 91. How Often Buyers Asked Builders about Energy Efficiency



Source: Participant Builder Interviews. "How frequently do buyers ask about energy efficiency when they visit your model homes/speak with you about a new home?" (n≥30)

With more customers inquiring about energy efficiency, half (16 of 30) of the builders interviewed thought that customers were more inclined to buy an energy-efficient home with the Focus on Energy certification. However, most agreed that the certification was not the determining factor in a home purchase. One builder commented that he thought the certification mattered more to buyers of homes within a planned development and less to custom home buyers because they are more involved in the home design.

Builders reported the following about customers who bought a Program home:

- "The homeowners look at me as the builder as more thoughtful about the construction details and comfort."
- "They have the Program emblem they can put on their utility box and it will matter someday [for resale]."
- "They get something that's been measured and tested and verified. That's a level of confidence."
- "How much less expensive it is to live in their home. I have customers who e-mail me their bills monthly to show me how much less expensive it is."

Suggestions for Improvement

Builders identified many different areas in which stakeholders could improve the Program. Builders most frequently reported that the Program changed too often (four of 30) and said they would like to see higher incentives to cover the costs associated with Program homes (three of 30). While some builders reported the Program changed too often, others said the Program did not push builders far enough in adopting energy-efficient building practices. Builders also made the following suggestions:

- Improve contact with small builders/the current Program is too focused on large tract home builders (three builders)
- Offer more training in shorter sessions, like the lumber yard session (one builder)
- Create an online portal for cooperative advertising reimbursements (one builder)
- Show more detail on incentive checks, such as to which house it applies to (one builder)

Building Performance Consultants

The Evaluation Team interviewed 10 participant and four nonparticipant Building Performance Consultants regarding their experience with the Program (participants), awareness of the Program (nonparticipants), and observations about the Wisconsin building market.

Experience

Participant Building Performance Consultants are experienced with the Program and are also qualified to certify homes in other energy-efficiency standards such as ENERGY STAR, GreenBuilt, or LEED. The interviewed Building Performance Consultants have worked with the Program for an average of eight years. Only one of 10 Building Performance Consultants did not participate in other voluntary certification programs.

Three of 10 Building Performance Consultants said they also worked with the Focus on Energy Home Performance with ENERGY STAR Program. An additional five said they worked with Home Performance with ENERGY STAR before that Program's delivery model changed. One of the 10 respondents reported working with the Focus on Energy Small Business Lighting Program.

All four nonparticipant Building Performance Consultants reported they were aware of the New Homes Program, but they said they needed to choose between the Home Performance with ENERGY STAR Program and the New Homes Program because the programs operated so differently. All four were active in the Home Performance with ENERGY STAR Program. These nonparticipant Building Performance Consultants said that they did not participate in the New Homes Program either because they felt more comfortable in the existing homes market or they could not justify the cost nor pay the fees ($300-$400 per year) to be active in the Program. One said he would be more likely to participate if the New Homes Program offered an apprenticeship option so he could learn, hands-on, about energy-efficient new homes.

Participating Building Performance Consultants reported that they spend a lot of time with builders new to the Program to ensure that they understood the building science, techniques, and materials needed to qualify for the Program. They also reported that they troubleshot issues with builders, helped identify tax credits or other certifications, and helped with marketing, none of which are part of their formal Program role.

Satisfaction

The 10 participating Building Performance Consultants expressed a moderate level of satisfaction with the Program. Two said they were "very satisfied," seven said they were "somewhat satisfied," and one was "not too satisfied." The dissatisfied Building Performance Consultant said that builders have a difficult time marketing the Program due to stale marketing materials and lack of training opportunities.

Satisfied Building Performance Consultants said that the Program did a good job of driving better building, educating builders, and communicating with them and with builders. They also described Implementer staff as "wonderful" and said that they appreciated their knowledge and communication.

- Eight of 10 Building Performance Consultants were" very satisfied" with their communication with Implementer staff.
- Two of 10 were "somewhat satisfied."
- Building Performance Consultants cited the responsiveness of Implementer staff as the reason for their satisfaction.

The Building Performance Consultants were also moderately satisfied with their interactions with builders, with four reporting they were "very satisfied" with builders, five reporting they were "somewhat satisfied," and one was "not at all satisfied." Building Performance Consultants said they would prefer to work with builders instead of project managers, that builders had a difficult time with changing Program requirements, and that builders in rural markets did not see as much value in the Program because their customers were less interested in energy efficiency.

As reported in the Program Data Management and Reporting section, all Building Performance Consultants interviewed reported inefficiencies in the Program's data collection process.

Building Market Observations

Building Performance Consultants expressed mixed opinions about the Program's impact on building practices. Half of participant Building Performance Consultants interviewed thought that the Program positively changed building techniques and technologies as well as builder understanding of energy efficiency. The other half did not think the Program influenced builders. One said he thought Wisconsin builders were regressing in their energy-efficient building practices, stating that the code or the Program needed to change to catch up with other states.

Building Performance Consultants said the most significant improvements in building techniques are in air tightness; whole-house ventilation; HVAC; better insulation, framing, water heating; and reduction in square footage.

Suggestions for Improvement

Building Performance Consultants identified several areas for improvement. First, three said that the Program requires duplicate data entry that could be simplified by entering data on tablets and eliminating the extra data workbook. Second, they said they would like more opportunities to interact with their peers or to receive field trainings to improve their skills and knowledge. A few suggested meeting at least once annually with Administrator staff and Implementer staff and builders.

Eight of 10 Building Performance Consultants said they were concerned about cutbacks made to the Program's marketing and incentive budgets; some reported they thought those cuts caused the Program to lose momentum and market share and did not improve customer awareness. One said he was worried that low customer awareness will limit the Program's future progress.

Program Cost-Effectiveness

Evaluators commonly use cost-effectiveness tests to compare the benefits and costs of a demand-side management program. The benefit/cost (B/C) test used in Wisconsin is a modified version of the TRC test. Appendix I includes a description of the TRC test.

Table 99 lists the CY 2011-2013 incentive costs for the New Homes Program.

Table 99. New Homes Program Incentive Costs

	CY 2013	CY 2011-2013
Incentive Costs	$ 1,273,134	$ 1,273,134

The Evaluation Team found the CY 2013 Program to be cost-effective (a TRC benefit/cost ratio above 1). Table 100 lists the evaluated costs and benefits.

Table 100. New Homes Program Costs and Benefits

Cost and Benefit Category	CY 2013	CY 2012
Costs		
Administration Costs	$284,881	$313,548
Delivery Costs	$649,656	$715,030
Incremental Measure Costs	$3,846,211	$4,798,235
Total Non-Incentive Costs	$4,780,749	$5,826,813
Benefits		
Electric Benefits	$3,999,342	$4,024,689
Gas Benefits	$10,387,502	$10,477,967
Emissions Benefits	$2,917,289	$3,020,408
Total TRC Benefits	$17,304,133	$17,523,064
Net TRC Benefits	**$12,523,385**	**$11,696,250**
TRC B/C Ratio	**3.62**	**3.01**

Evaluation Outcomes and Recommendations

The Evaluation Team identified the following outcomes and recommendations to improve the New Homes Program.

Outcome 1. High Program awareness but low customer home buyer demand indicates the Focus on Energy brand may not resonate with many new home buyers.

Nonparticipants value energy efficiency and were aware of the Program, yet they chose to purchase non-Program new homes. Nine of 15 nonparticipants indicated awareness of the Program, and all 15 stated they lived in an energy-efficient home (but not one that carried a third-party certification). Additionally, nonparticipant survey results indicate that respondents placed a high value on energy efficiency and quality of the home when shopping for a new home. Nonparticipants may not associate the Focus on Energy brand with additional value, quality, or assurance that their home was energy-efficient, or they may lack the energy-efficiency knowledge to discern the quality of a Program home from a non-Program home.

Building Performance Consultants and builders have requested more substantive Program marketing efforts, but anticipated Program budget limitations in 2014 will not accommodate such efforts beyond printing and updates to brochures and fact sheets.

Outcome 2. Although based on a small sample size, half of the surveyed participant home buyers were between 25 to 34 years old. Nonparticipants tended to be older, live in larger homes, and pay more than $400,000 for their homes.

This may reflect the fact that more first-time home buyers entered the market in CY 2013 or that energy-efficiency certification resonates more with younger home buyers. However, because this

finding is based on a small sample it may be an anomaly in CY 2013 and should be monitored in future evaluation to track demographic trends.

Outcome 3. The Program Implementer's memberships in home builder associations no longer benefits Program awareness and builder recruitment.

Implementer staff reported that the Program historically spends approximately $13,000 per year in dues to maintain memberships with the 24 home builder associations around the state. In recent years, these organizations have become less active and have not offered opportunities to connect with builders or to promote the Program as they once did. Furthermore, the Program maintains a large number of affiliated builders.

Recommendation 1. To address outcomes 1 through 3, enhance marketing to home buyers by reallocating funding from home builder association dues. Capitalize on participants' satisfaction and beliefs that Focus on Energy homes afford additional quality to attract new home buyers who value quality. Use marketing materials to emphasize the importance of the third-party verification for retaining resale value. Continue marketing the value of third-party verification to non-program builders as well as home buyers. If, over the next evaluation year, Program staff note a trend of younger participant buyers, target younger buyers through mobile and online advertising. Other new homes programs, such as EmPOWER Maryland, are successfully employing these strategies with a similar target audience. For example:

- Develop case studies featuring participant home buyer, home details, and customer quotes.
- Develop messaging around the value of the Focus on Energy certification for resale purposes.
- Provide new materials to builders and offer training about the purpose of the revised messaging.
- Consider using Google AdWords, Trulia, Zillow, Facebook, or Bing as advertising platforms.
- Implement tracking metrics to capture click-through rates, page views, open rates, or other metrics as appropriate to begin tracking marketing spend impact over time.
- Consider cross-marketing efforts with other Focus on Energy programs.

Outcome 4. Builders offer the most important source of information for prospective home buyers, but may lack the time or sales skills to actively promote the Program and use the cooperative advertising reimbursement.

Participant home buyers looked to builders as one of the most important sources of information and influence regarding their home purchase, yet several participants said they wished their builder had discussed the Program in greater detail. Builders reported they do not market Focus on Energy homes differently than their other homes, and while they reported being aware of the cooperative advertising reimbursement, they lacked the time to pursue it or needed additional information about how to use it.

Recommendation 4. Leverage builders as the primary source of information for home buyers by developing sales training and instructions for cooperative advertising reimbursement. For example:

- Offer sales training during the smaller continuing education classes or as part of the annual Building Performance Consultants meeting. Include builders' sales staff and emphasize selling the Focus on Energy brand, which provides additional quality and extra assurance about the home's energy-efficiency status.
- During sales training, conduct step-by-step instructions on how to use the cooperative advertising reimbursement and emphasize its advantages. Offer examples of how others have used the reimbursement.
- Ensure builders are aware that Building Performance Consultants can receive all or part of the cooperative advertising incentive to facilitate Program advertising for builders.

Outcome 5. Building Performance Consultants found the Program data entry process redundant and inefficient.

Building Performance Consultants reported they must enter home data twice in order to comply with Program Implementer's tracking database, a step that can add up to two hours of additional data entry for each home processed. Currently, Building Performance Consultants model home data in REM/Rate and then must re-enter certain data fields in a spreadsheet for Implementer staff use.

Recommendation 3. Explore using a tablet interface with REM/Rate that would allow Building Performance Consultants to enter data once and provide required data to Implementer in compatible software.

Outcome 6. Due to the lack of participation in the Program's most efficient incentive tiers, the Program has an opportunity to encourage builders to achieve greater savings per home.

Nearly 90% of participation occurred in incentive tiers that achieved 20% or less energy savings above UDC. Therefore, the CY 2013 Program did not encourage builders to achieve maximum efficiency per home. The Evaluation Team understands that in CY 2014 incentive amounts will be lower, which may perpetuate this issue.

Recommendation 4. Explore ways to encourage deeper savings in each home. Possibilities include increased emphasis on the most efficient tiers in Program materials, assessing need for additional training opportunities, or revisiting incentive structure to incent builders to pursue higher-tier homes.

Residential Rewards Program

The Residential Rewards Program (Program) offers residential customers a range of prescriptive incentives (also known as rewards) for qualified energy-efficient equipment (such as heating, ventilation and air conditioning equipment), home improvements, and renewable-energy technologies. The Program expanded its measure offerings in CY 2013 to include a heating and air conditioning bundle, a duct sealing pilot, and attic insulation.

Table 101 provides a summary of the Program's targets and actual spending, savings, participation and cost-effectiveness.

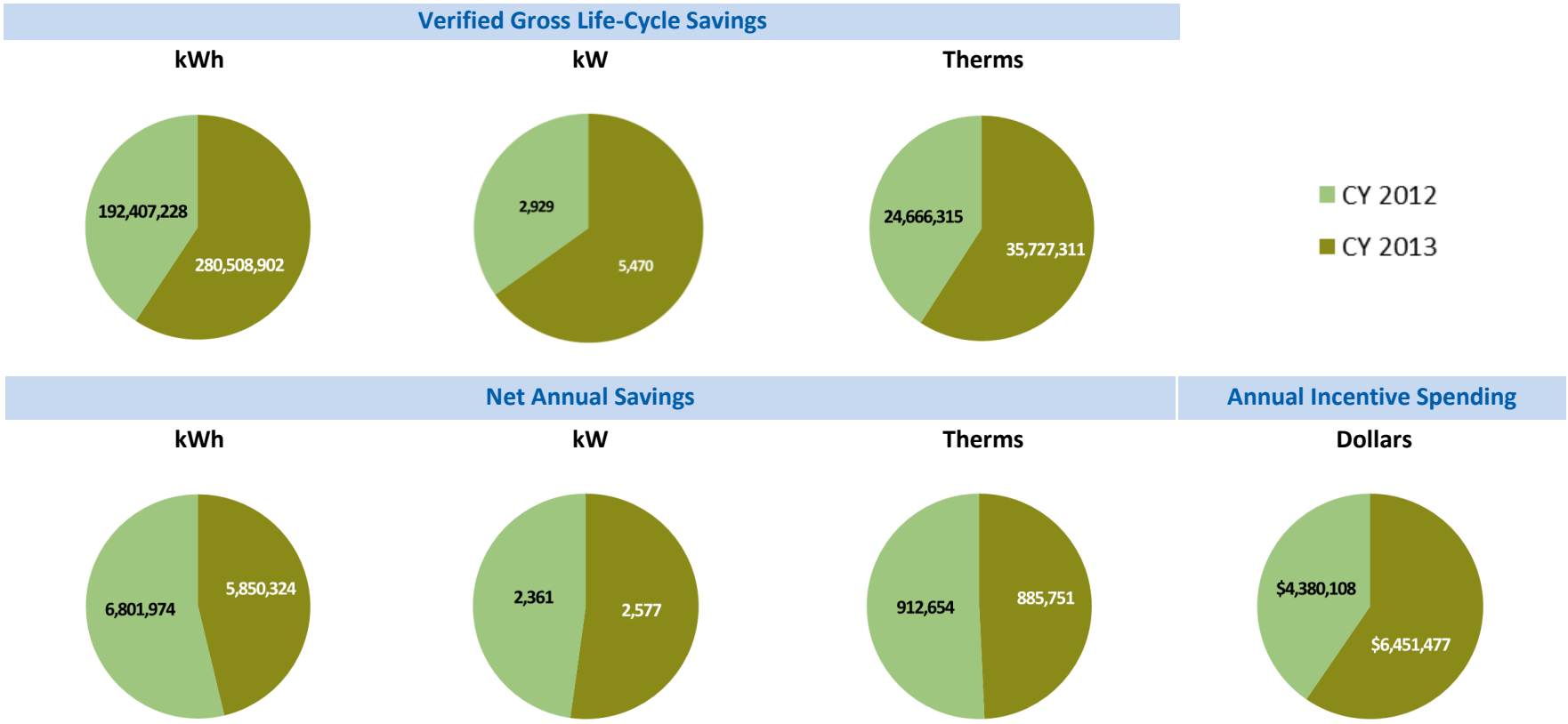
Table 101. Residential Rewards Program Actuals Summary[1]

Item	Units	CY 2013 Actual Amount	CY 2012-2013[2] Actual Amount
Incentive Spending	$	$ 6,451,477	$ 10,831,585
Verified Gross Life-Cycle Savings	kWh	280,508,902	472,916,130
	kW	5,470	8,399
	therms	35,727,311	60,393,625
Net Annual Savings	kWh	5,850,324	12,652,298
	kW	2,577	4,938
	therms	885,751	1,798,404
Participation	Number of Participants	22,177	36,785
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	1.19	1.96 [3]

[1] This table presents gross life-cycle savings to allow comparison with Focus on Energy's quadrennial gross life-cycle savings target, and net annual savings to allow assessment of the Program Administrator and Program Implementer's achievement of net annual savings.
[2] The Program launched in 2012.
[3] The cost-effectiveness ratio is for CY 2012 only.

Figure 92 provides a summary of savings and spending progress made in CY 2012 and CY 2013.

Figure 92. Residential Rewards Program Two-Year (2012-2013) Savings and Spending Progress



Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted impact and process evaluations for CY 2013. These were the key questions that directed the design of the EM&V approach:

- What are the gross and net electric and gas savings?
- How can the Program increase its energy and demand savings?
- What is the Program process? Are key staff roles clearly defined?
- What are the barriers to increased customer participation and how effectively is the Program overcoming those barriers?
- How is the Program leveraging the current supply chain for measures and what changes can increase the supply chain's support of the Program?
- What is customer satisfaction with the Program?

The Evaluation Team designed its EM&V approach to integrate multiple perspectives in assessing Program performance. Table 102 lists the specific data collection activities and samples sizes used to evaluate the Program.

Table 102. Residential Rewards Program Data Collection Activities and Sample Sizes

Activity	CY 2013 Sample Size (n)	CY 2011-2013 Sample Size (n)
Impact		
Program Database Review	Census (22,177)	Census (36,785)
Electronically Commutated Motors (ECM) Metering[1]	80	109
Participant Customer Surveys (impact and process)	140	140
Process		
Stakeholder Interviews	2	3
Participant Trade Ally Interviews	10	20
Materials Review[2]	All New Materials	Census
Benchmarking[3]	All Measures	All Measures

[1] The sample sizes represent the number of heating seasons captured, not the number or homes installed with meters, as some participants opted to leave the meters installed for an extra year.

[2] The Evaluation Team only conducted a materials review of new Program and marketing materials created in CY 2013.

[3] The Evaluation Team only conducted benchmarking on measure offerings, measure incentive amounts, and customer satisfaction

Data Collection Activities

For the CY 2013 evaluation, the Evaluation Team conducted ongoing impact and process data collection activities for a three-year period that included metering study of ECMs as well as interviews and surveys with trade allies, the Program Administrator, the Program Implementer, and Program participants.

ECM Metering Study

Understanding how the participants used ECM furnace blowers was a top priority for this evaluation. Manufacturers claim energy savings can be as high as 80% if consumers replace existing permanent split capacitor indoor blower motors with high-efficiency indoor blower motors (ECM blowers).

Energy savings and demand reductions for the Program, however, depend significantly on how participants use the fan; for example, anticipated savings will decrease if the fan runs longer than the furnace.

Forthcoming Research

The Evaluation Team will retrieve the 57 ECM meters installed in fall 2013, and report on the results of this study in the CY 2014 evaluation.

In CY 2012, the Evaluation Team launched two-phase effort to install meters on ECM furnaces. Field staff installed thirty meters on ECM furnaces in February 2012. Of those homes, 23 participants opted to leave the meters installed for another year.

Field staff installed an additional 56 meters in participant homes in fall 2013 to capture the CY 2013-2014 heating season. In total, the Evaluation has collected and continues to collect data on a total of 109 heating seasons through this metering study.

In order to capture the entire CY 2013-2014 heating season, the Evaluation Team must leave the most recently installed meters until the end of March, 2014, which means the results are not included in the *CY 2013 Evaluation Report*. The Evaluation Team will submit an interim memo in June 2014 presenting the final findings of the study.

Interviews

The Evaluation Team conducted interviews with staff from the Program Administrator and the Program Implementer. Topics covered in the interviews included Program status and changes in CY 2013, marketing and outreach activities, customer and Trade Ally experience, and Program administration and data management.

Interviews included a random selection of 10 participating contractors. Topics covered included Program experience and satisfaction. The Evaluation Team defined participating contractors as those who participated in the Program in CY 2013, regardless if they were registered Trade Allies. Eight of the 10

contractors interviewed were registered Trade Allies. All 10 of the contractors interviewed provide HVAC services; one also provides water-heating services.[26]

Surveys

The Evaluation Team fielded participating customer surveys in two waves. The first survey wave included participating customers who purchased a 95% AFUE furnace. The second wave included customers who purchased any other eligible measure. Both surveys inquired about Program experience, awareness, participation motivation, and satisfaction as well as freeridership and spillover. The Evaluation Team defined participating customers as those who installed a qualifying measure in CY 2013.

Impact Evaluation

To calculate gross savings, the Evaluation Team conducted a tracking database review of reported installations and verified installation rates. To calculate net savings, the Evaluation Team used participant survey data as well as data on market conditions.

Evaluation of Gross Savings

This section describes how the Evaluation Team assessed gross Program savings.

Tracking Database Review

The Evaluation Team reviewed the CY 2013 data contained in SPECTRUM (the Program database) for completeness and quality. SPECTRUM contained all of the data fields necessary to perform the CY 2013 evaluation activities. However, the CY 2012 evaluation's recommendations regarding improved Program tracking still apply (such as tracking more measure specific fields, for example, size of the unit).

Gross and Verified Savings Analysis

As described in the Residential Rewards Program Specific Evaluation Plan, most gross impact evaluation activities, such as engineering reviews, occurred during the CY 2012 evaluation in order to report early results for updates to claimed savings. Therefore, in addition to reviewing Program data, the Evaluation Team used deemed assumptions and algorithms in CY 2013 to verify the measure-level savings.

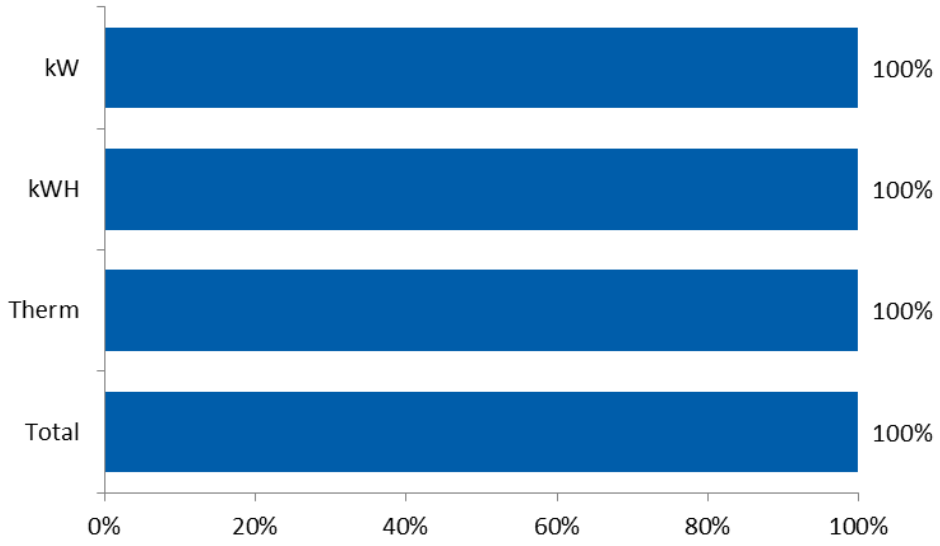
Realization Rates

Overall, the Program achieved an evaluated realization rate of 100%. Thus, the Evaluation Team verified the gross savings reported in the Program tracking database, in accordance with the Program operating criteria and previously agreed upon evaluation criteria.

Figure 93 shows the realization rate by fuel type.

[26] The 10 interviewed HVAC contractors are a representative sample of Program Trade Allies (despite the lack of contractors offering other Program measures such as renewables) as furnace installs comprise the majority of the Program participation.

Figure 93. Residential Rewards Program Realization Rate by Fuel Type



Gross Savings and Verified Gross Savings Results

Table 103 lists the total and verified gross savings achieved by the Program in CY 2013.

Table 103. Residential Rewards Program Gross Savings Summary

Project Type	Ex Ante Gross			Verified Gross		
	kWh	kW	Therms	kWh	kW	Therms
Current Annual	12,550,786	5,470	1,582,401	12,550,786	5,470	1,582,401
Current Life-Cycle	280,508,902	5,470	35,727,311	280,508,902	5,470	35,727,311

Evaluation of Net Savings

This section describes how the Evaluation Team assessed net Program savings.

Net-to-Gross Analysis

The Evaluation Team assessed net savings based on two key components: freeridership and spillover.

Freeridership Findings

Freeriders are participants who would have purchased the same efficient measure at the same time without any influence from the Program. For CY 2013, the Evaluation Team used three different methodologies to assess freeridership:

- Measures included in the Market Baseline Study or where adequate market baseline data were available from other sources. The Evaluation Team applied a SMP methodology to determine freeridership. This methodology estimates net savings based on data on market conditions, rather than participant survey data.

- Measures not included in the Market Baseline Study but captured in the participant survey. The Evaluation Team applied a self-report methodology and derived the participants' freeridership score by converting their survey responses into freeridership scores and then applying a consistent, rules-based calculation to obtain the overall freeridership score.
- Measures that were neither included in the Market Baseline Study nor had significant sample sizes from the participant survey. The Evaluation Team applied a ratio developed from the weighted average of the SMP measures' net of freerider savings to the *ex ante* savings. The savings achieved by these measure groups is minimal as each comprised 2% or less of the Program savings.

Table 104 shows which methodology was applied for each measure group within the Program, and the sample size for the measure-level analysis.

Table 104. Residential Rewards Program Freeridership Methodology by Measure Group

Measure Group Name	Sample Size	% of Program Savings (MMBtu)
SMP Measures		
Boiler	37	5%
Furnace (gas savings)	424	61%
Water Heater	N/A[1]	3%
Self-Report Measures		
Furnace (electric savings)	87	15%
Furnace and Air Conditioner	28	13%
Measures Weighted by SMP and Self-Report Results		
Adjustment	N/A	0%
Duct Sealing	N/A	0%
ECM (standalone)	N/A	0%
Heat Pump	N/A	1%
Insulation	N/A	0%
Renewable Energy	N/A	2%

[1] The distribution of efficient water heaters comes from the Department of Energy report "Energy Conservation Program: Energy Conservation Standards for Residential Water Heaters, Direct Heating Equipment, and Pool Heaters; Final Rule."

Overall, the Program had an average net-of-freeridership of 51% across all respondents, after the Evaluation Team weighted survey responses and SMP analysis for each measure by savings.

Table 105. Residential Rewards Program Net-of-Freeridership Percentage Estimates by Measure Group

Measure Group Name	Net-of-Freeridership Percentage Estimate (Based on MMBtu Savings)
Adjustment	48%
Boiler	46%
Duct Sealing	53%
ECM	44%
Furnace	50%
Furnace and Air Conditioner	52%
Heat Pump	44%
Insulation	53%
Renewable Energy	44%
Water Heater	110%
Overall	**51%**

Spillover Findings

Spillover results when customers invest in additional efficiency measures or make additional energy-efficient behavior choices beyond those rebated through the Program. Participants reported that the Program was highly influential in their purchase and installation of energy efficient refrigerators and clothes washers as well as insulation and windows (Table 106).

Table 106. Residential Rewards Program Spillover Measures

Measure Name	Quantity	Per-Unit MMBtu Savings[1]	Total MMBtu Savings[1]
Refrigerator	1	0.39	0.39
Clothes washer	1	1.21	1.21
Insulation	250[2]	0.04	10.54
Windows	2	9.08	18.15
Total			**30.29**

[1] The Evaluation Team used MMBtu to weight the responses across participants for both electric and gas savings.
[2] Quantity measured in square footage.

As shown in Table 107, the Evaluation Team estimated spillover at 2.53% of the Program's CY 2013 evaluated gross savings.

Table 107. Residential Rewards Program Spillover Estimate

Spillover MMBtu Savings	Survey Participant MMBtu Savings[1]	Percentage of Spillover
30.29	1,197.43	2.53%

[1] This value represents the CY 2013 evaluated gross energy savings.

Net-to-Gross Ratio

In order to calculate the Program net-to-gross ratio, the Evaluation Team combined the SMP, self-report freeridership, and spillover results. Table 108 shows the net-of-freeridership savings by measure group and overall.

Table 108. CY 2013 Residential Rewards Program Annual Net-of-Freeridership Savings by Measure

Measure Group Name	Annual Net-of-Freeridership Savings			
	kWh	kW	Therms	MMBtu
Adjustment Measures[1]	(1,748)	(1)	(63)	(12)
Boiler	-	-	42,922	4,292
Duct Sealing	45	-	87	9
ECM	29,756	12	-	102
Furnace	3,534,604	1,414	619,100	73,970
Furnace and Air Conditioner	1,047,907	783	128,948	16,470
Heat Pump	30,126	5	-	103
Insulation	705	1	534	56
Renewable Energy	626,855	195	1,205	2,259
Water Heater	264,557	30	52,984	6,201
Total	**5,532,808**	**2,439**	**845,718**	**103,450**

[1] Adjustment measures are applied to correct for data entry errors in Program savings, such as incomplete entries, duplicate entries, and typing errors.

Based on these results, the Program net-to-gross ratio can be calculated as:

$$NTG = 1 - Freeridership\ Ratio + Spillover\ Ratio$$

From another perspective (but with the same result), net-to-gross can be described as the ratio of net savings to verified gross savings.

This yielded an overall net-to-gross estimate of 54% for the Program. Table 109 shows total net-of-freeridership savings, spillover savings, and total net savings in MMBtu, as well as the overall Program net-to-gross ratio.

Table 109. Residential Rewards Program Savings and Net-to-Gross Ratio

Total Annual Net-of-Freeridership Savings (MMBtu)	Total Spillover Savings (MMBtu)	Total Annual Net Savings (MMBtu)	Program NTG Ratio
103,450	5,087	108,537	54%

Net Savings Results

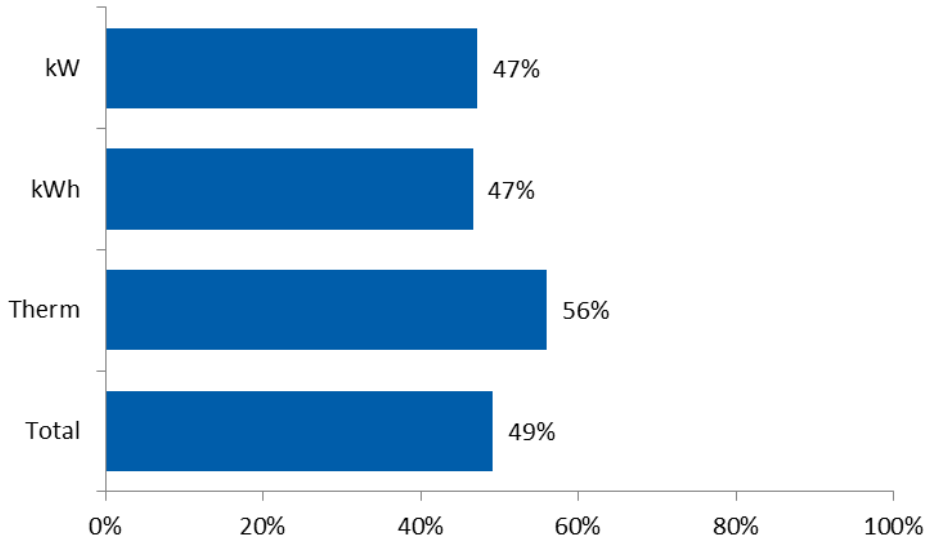
Table 110 shows the net energy impacts (kWh, kW, and therms) for the Program. The Evaluation Team attributed these savings net of what would have occurred without the Program.

Table 110. Residential Rewards Program Net Savings

		Verified Net		
		kWh	KW	Therms
Current Program	Annual	5,850,324	2,577	885,751
	Life-Cycle	129,329,294	2,577	19,710,654

Figure 94 shows the net savings as a percentage of the *ex ante* gross savings by fuel type.

Figure 94. Residential Rewards Program Net Savings as a Percentage of *Ex Ante* Savings by Fuel Type



Process Evaluation

To evaluate Program performance and opportunities for improvement, the Evaluation Team's process evaluation included perspectives from the Program Administrator, the Program Implementer, participating contractors, and participating customers. Through interviews and surveys, as well as a review of Program materials and benchmarking against similar programs, the Evaluation Team assessed and evaluated:

- Program status and changes in CY 2013
- Program processes and management
- Participation experiences and satisfaction

The Evaluation Team also followed up on issues identified in the CY 2012 evaluation. Key recommendations from CY 2012 included:

- Exploring ways to improve participation in the renewables component
- Updating the operations manual regarding Trade Ally and customer processes

- Providing an online application for Program participants
- Electronically tracking measure-specific information

Program Design, History, and Goals

Focus on Energy launched the Program in January 2012, replacing the Energy Efficient Heating and Cooling Incentive Program. The Program Administrator and Program Implementer initially launched the Residential Rewards Program with a similar measure mix to the Energy Efficient Heating and Cooling Incentive Program to avoid market disruption in CY 2012. However, the new Program's measure mix expanded in CY 2013 to include the measures and rewards listed in Table 111.

Table 111. Residential Rewards Program Measure Offering in CY 2013

Equipment	Reward
90% AFUE Furnace with ECM (Natural Gas, Propane, or Oil-Fired)	$125
95% AFUE Natural Gas Furnace with ECM (Natural Gas only)	$275
95% AFUE Natural Gas Furnace with ECM and 16 SEER Central Air Conditioner (New for CY 2013)	$400
ECM Replacement	$125
Natural Gas Home Heating Boiler 90% AFUE	$300
Natural Gas Home Heating Boiler 95% AFUE	$400
Air Source Heat Pump 16+ SEER (New for CY 2013)	$300
Indirect Water Heater for Home Heating Boiler	$100
Condensing Storage Water Heater	$100
Storage Water Heater, EF > 0.67	$50
Tankless Water Heater, EF > 0.82	$100
Electric Water Heater	$25
Heat Pump Water Heater (New for CY 2013)	$300
Geothermal Heat Pump	$650
Solar Electric System[1]	$600 per kilowatts DC (kWDC) rated capacity with a 0.5 kWDC minimum, $2,400 maximum
Solar Hot Water System, Natural Gas Back-up[1]	$6.00 per therm saved, $1,200 maximum
Solar Hot Water System, Electric Back-up[1]	$0.35 per kWh saved, $1,200 maximum
Attic Insulation (New for CY 2013)	75% of installed cost up to $300
Duct Sealing Pilot (New for CY 2013)	$375

[1] The Wisconsin PSC issued an order that suspended solar rewards beginning mid-August 2013 through the end of the year. Focus on Energy resumed the rewards in January 2014.

In summary, the measures introduced in CY 2013 included:

- A heating and air conditioning bundle
- Air source heat pump
- ECM replacement

- Heat pump water heater
- Attic insulation
- A duct sealing pilot offering

The heating and air conditioning bundle was popular with customers in 2013, with over 3,000 participants installing the bundle. The air source heat pump had 46 participants and the heat pump water heater had over 130 participants install the measure. However, few participants were interested in the attic insulation and duct dealing measures with only 10 and one participant(s) installing these measures respectively.

In CY 2013, the Program Implementer offered attic insulation through the Program to supplement the Home Performance with ENERGY STAR Program for customers who were not interested in the whole-home approach. Therefore, only Home Performance with ENERGY STAR Trade Allies were allowed to offer attic insulation through the Residential Rewards Program as they were familiar with insulation offerings and could install the measure or hire subcontractors.

However, not many of those Trade Allies actively participated and offered the measure to their customers in CY 2013. To test the duct-sealing pilot, the Program Implementer offered this measure to four communities in Wisconsin starting midyear CY 2013. The duct-sealing measure also had limited Trade Ally and customer participation.

In an effort to compare the Program offerings to the measures and incentives offered through other programs around the country, the Evaluation Team conducted a benchmarking review of similar residential prescriptive programs, which are listed in Table 112.

Table 112. Residential Rewards Program Benchmarked Programs

Utility	Location	Type of Prescriptive Program
Midwestern Utility A	Ohio	Gas
Midwestern Utility B	Illinois	Gas and electric
Midwestern Utility C	Indiana	Electric
Midwestern Utility D	Minnesota	Gas and electric
Western Utility A	Washington	Gas and electric
Western Utility B	Idaho	Gas and electric
Southern Utility A	Arkansas	Electric
Southern Utility B	Arkansas	Electric

This review found that the Program offers a similar variety of measure categories as other programs reviewed but it is only one of two programs reviewed that offers renewable measures with its residential prescriptive offerings. However, some of the other benchmarked programs offer more

variety within measure categories, such as additional weatherization measures, or offer measures such as appliances (not included in the Program).[27]

Table 113. Residential Rewards Program Measure Offerings Benchmarked Against Similar Programs

Utility	HVAC	Water Heating	Weatherization	Renewables	Appliances
Focus on Energy	**x**	**x**	**x**	**x**	
Midwestern Utility A	x	x			
Midwestern Utility B	x	x		x	x
Midwestern Utility C	x		x		
Midwestern Utility D	x			x[1]	
Western Utility A	x		x		x
Western Utility B	x	x	x		x
Southern Utility A	x	x	x		
Southern Utility B	x		x		

[1] This utility did not offer renewable rebates through its residential prescriptive programs, but did offer solar rebates through a separate program in the portfolio

Furnaces, specifically the 95% AFUE furnace with an ECM, make up more than 70% of the Program's energy savings. Because of this, the Evaluation Team benchmarked the Program's furnace offerings and incentives against similar furnace offerings around the country. Table 114 lists these findings. Compared to similar programs, the Program offers a slightly higher incentive for the 95% AFUE furnace. In addition, most of the furnace offerings do not require an ECM motor, unlike the Residential Rewards Program. Finally, several of the benchmarked programs offer incentives for 96% or higher AFUE furnaces, while the Program does not.

Table 114. Benchmarking Furnace Incentive Amounts Against Similar Programs

Utility	Incentive Amount			
	90-94% AFUE	95% AFUE	96% AFUE or Greater	ECM
Focus on Energy	$125[1]	$275[1]	N/A	$125
Midwestern Utility A	N/A	$200	$200	N/A
Midwestern Utility B	N/A	$200	$300	N/A
Midwestern Utility C	$150	$250	N/A	$60
Midwestern Utility D	$50	$50	$300	$100
Western Utility B	N/A	$200	N/A	N/A

[1] Requires ECM

The Evaluation Team also benchmarked the Program's measure offerings and reward amounts for all measures against other similar residential prescriptive programs. Appendix N contains a complete account of these benchmarking results.

[27] Focus on Energy offers appliance incentives through the Residential Lighting and Appliance Program.

In CY 2013, the new measures were added that more closely aligned the Program with the Enhanced Rewards Program (formerly the Home Heating and Assistance Program), which offers residential prescriptive incentives for income-qualified customers. Both the Implementer and Administrator staff reported that the closer affiliation between the two programs made marketing easier by combining outreach materials, which made it easier for Trade Allies and customers to understand the programs.

Beginning in June 2013, the Program offered a new benefit to Trade Allies—the instant discount option. Offered only for home heating and water heating applications, the instant discount gives registered Trade Allies the option to receive the Program reward and credit the customer on the invoice for that amount, meaning customers get the discount upfront.

According to the Program Implementer, this service benefits participants by offering a lower-cost product to the customer and, in turn, helps Trade Allies sell more high-efficiency equipment.

Program Goals

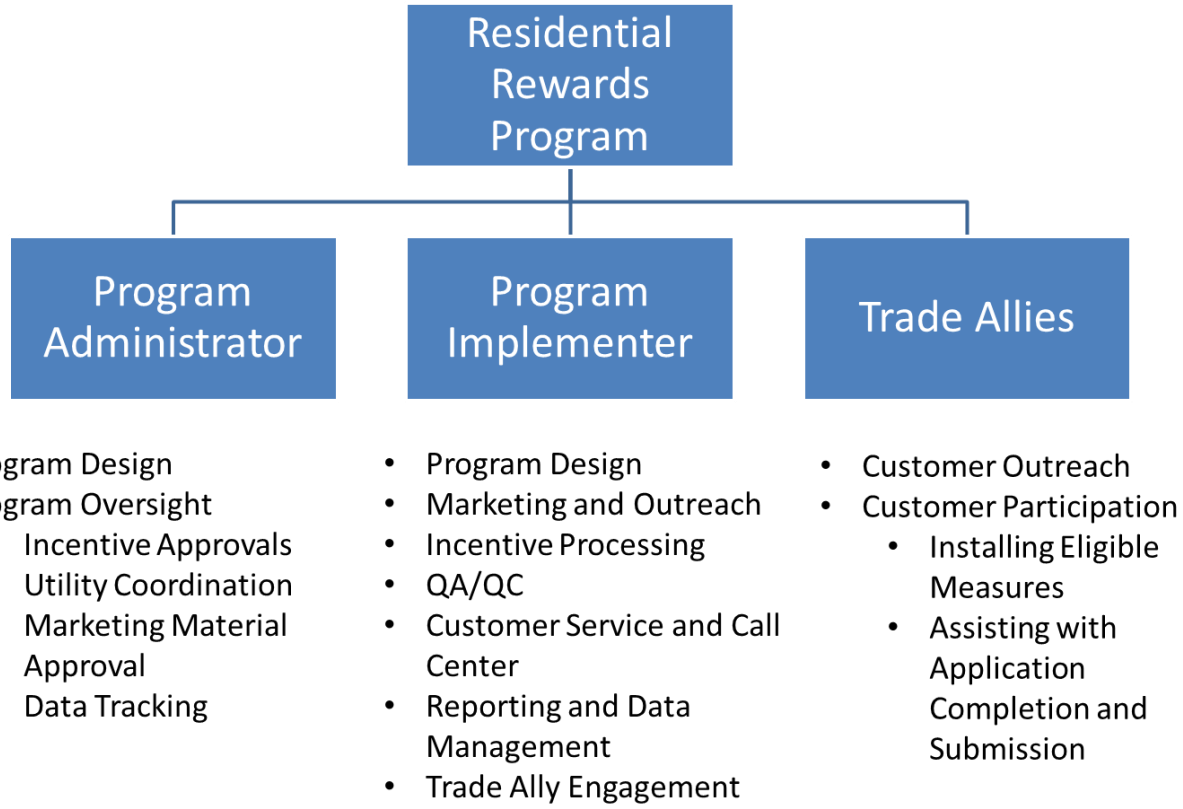
The Program performed in line with the Program Administrator and Program Implementer's expectations regarding the Program's internal participation and energy-savings goals in CY 2013, reaching internal targets by the end of September. Administrator staff reported that because of high participation, it became clear the Program would exhaust its reward dollars before the end of the year if the Program Administrator did not increase funding and energy goals. Consequently, the Program Administrator increased the funding and the internal energy-savings goals.

Administrator staff attributed the higher participation and energy savings to increased marketing efforts. In CY 2013, Implementer staff marketed the Enhanced Rewards Program and the Residential Rewards Program together.

Program Management and Delivery

This section describes the Evaluation Team's assessment of the Program's management and delivery processes. Figure 95 shows a diagram of key actors and their roles in the Program.

Figure 95. Residential Rewards Program Key Program Actors and Roles



Management and Delivery Structure

Administrator and Implementer staff reported that Program delivery worked well in CY 2012, so they did not make changes for CY 2013. As in CY 2012, Trade Allies continued to play a critical role in Program delivery, driving customer participation.

Implementer staff reported that they followed the delivery and implementation procedures outlined in the Program's operations manual. Although the delivery procedures did not change for CY 2013, the Program Implementer updated other sections of the operations manual, such as goals. The updated manual provides the following information on all Program design and delivery aspects:

- Program goals
- Implementation and operations
- Trade Ally management
- Application processing
- Quality assurance/quality control
- Customer service and engagement

Despite the well-designed delivery processes, the Program Implementer still encountered market barriers during Program implementation—specifically, low Trade Ally and customer participation in the new attic insulation and duct sealing measures.

Attic Insulation Participation

Implementer staff reported receiving fewer applications for attic insulation than anticipated, which they attribute to the small number of Trade Allies marketing the measure. Additionally, the attic insulation offered through the Residential Rewards Program competed against insulation measures offered through the Home Performance with ENERGY STAR Program. The Implementer found it challenging to encourage Home Performance with ENERGY STAR Trade Allies to participate in the Residential Rewards Program. Since the Home Performance with ENERGY STAR Program offered higher insulation incentives, the Trade Allies found it easier to sell to customers.

The Implementer also noted that bonus incentives through other programs, such as GreenMadison, provided additional incentives to Trade Allies who sold insulation measures through the Home Performance with ENERGY STAR Program. The Implementer said contractors were able to procure enough business through that program, so they had no need to market attic insulation for the Residential Rewards Program. Implementer staff reported that they believe there is a market for the attic insulation measure through the Residential Rewards Program.

In addition, according to the Program Implementer, the Home Performance with ENERGY STAR Program Trade Allies who participated in the Residential Rewards Program were not distributed evenly throughout the state, with most located in Wisconsin's major cities. As such, it was challenging to provide the attic insulation measure to the full eligible customer base outside of Wisconsin's major urban areas.

Duct Sealing Participation

Implementer staff reported the duct sealing pilot also had trouble gaining traction. The Program Implementer found it difficult to identify an appropriate pilot market, which led to low participation. In an attempt to increase participation, Implementer staff focused marketing efforts on mobile home park managers since mobile homes are often good candidates for duct sealing. Implementer staff also reported that it was difficult to locate Trade Allies to participate in the pilot because not many Trade Allies conduct duct sealing work.

During CY 2013, the Program Implementer focused on recruiting Trade Allies for the pilot through one-on-one communication and marketing. Due to Program budget restrictions, the Implementer discontinued the pilot for CY 2014, but plans to resume the pilot only if funding becomes available.

Key Program Processes

During CY 2013, the customer sign-up process differed little from the CY 2012 Program. Customers worked with a contractor or registered Trade Ally to install energy-efficient or renewable-energy

equipment. After purchasing and installing the eligible equipment, the customer or contractor submitted the Cash-Back Reward application to the Program Implementer. The Program Implementer's application process entailed validating the application for completeness and for verifying customer and equipment eligibility.

In CY 2013, the Program Implementer created separate applications for each measure group:

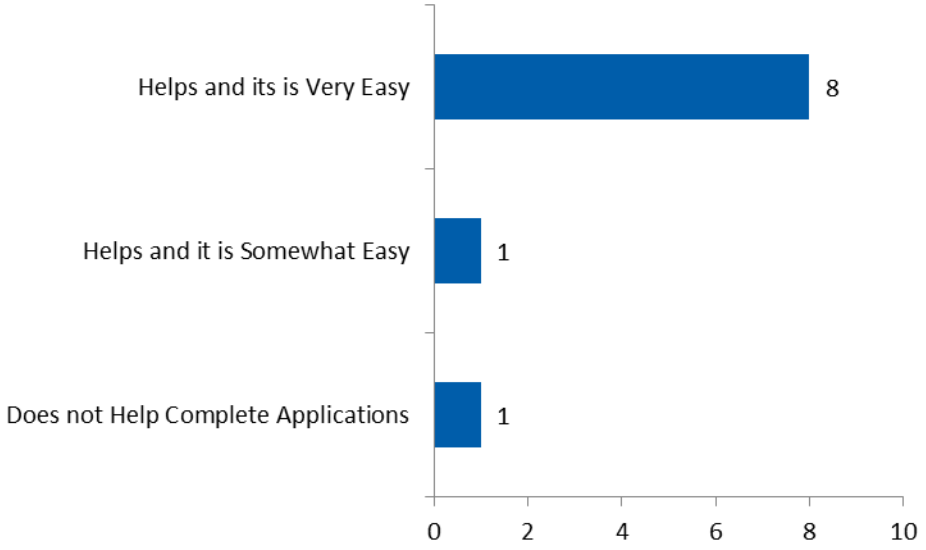
- Home heating and cooling
- Water heating
- Attic insulation and air sealing
- Geothermal
- Solar

The Implementer posted each application to the Program website, where it was available as a downloadable PDF. Customers could complete the application on the computer or by hand and submit it to the Implementer (along with the invoice) through e-mail, fax, or mail. Administrator staff reported they were planning to implement an online reward application, which customers will be able to submit through the website in CY 2014.

When surveyed, nine of the 10 contractors reported that they had helped their customers complete the application,[28] and one contractor said that he completed the reward application for his customers because his customers did not want to do it. All nine of the contractors who assisted customers with the applications found that the application process easy (see Figure 96).

[28] Participating contractors included eight registered Trade Allies and two nonregistered contractors.

Figure 96. How Easy Contractors Found the Application Process



Source: Participant Contractor Interview: D2, D3. "Do you often help your customers fill out the Residential Rewards application?" and "How easy was the application to fill out?" (n = 10)

The contractor who said that the application was "somewhat easy" to complete explained that, while the process was easy for the contractor, it was challenging for the customer because the customer did not understand how to obtain all of information needed for the application (e.g., the product unit number).

Customer surveys indicated that 97% of participating customers were satisfied with the application process; only 3% of the customers reported difficulty filling out the application or frustration with the application processing. When asked to recommend Program improvements, 3% of the customers requested a simplified application.

Program Data Management and Reporting

The Implementer continued to use the SPECTRUM database to track Program data. Implementer staff entered data from the completed applications into SPECTRUM, including customer information, equipment, installations, and reward amounts.

In CY 2013, the Implementer developed additional database capabilities to improve data reporting and tracking. Specifically, in CY 2013, the Implementer began using SPECTRUM's library function. The library is a database that contains all of the equipment make and model numbers. Implementer staff continuously update library as they add new equipment to the Program.

The Implementer also began using SPECTRUM's opportunities function. This function helped Implementer staff determine whether the customer had applied to the correct program (i.e., the Enhanced Rewards Program or the Residential Rewards Program). Implementer staff reported that the

process to incorporate the new SPECTRUM functions was smooth and that having the functions helped ensure data quality. Implementer staff also began using SPECTRUM, instead of an external customer relationship management software tool, to track Trade Ally interactions and progress in CY 2013. Administrator staff reported that they were pleased with SPECTRUM because it enabled them to provide better quality assurance and provided flexibility and easy access to information.

Implementer staff reviewed all of the submitted reward applications in SPECTRUM for eligibility and completeness, validating all information before submitting the applications for payment approval. To ensure quality installations of the new measures, the Program Implementer required onsite inspections by a third party for attic-insulation and air-sealing projects.

Marketing and Outreach

As discussed under Program Design, History, and Goals, the Implementer marketed the Program together with the Enhanced Rewards Program. Implementer staff developed a combined CY 2013 Marketing and Communications Plan to include marketing tactics, messages, and campaigns for the two programs. Tactics included mass media marketing such as using social media, improving web content, and sending direct mailings. The Implementer also continued to coordinate with utilities to include marketing tactics such as bill inserts, cobranded marketing materials, and mailing content.

Focus on Energy's overall CY 2013 effort included rebranding the Program marketing materials. As part of this effort, the Implementer added the new branding to applications, fact sheets, door hangers, and brochures. The Implementer also updated materials for the Enhanced Rewards Program offerings. The Evaluation Team found the updated materials to be clear and informative, with information applicable to both customers and Trade Allies and appropriate Program contact information.

The Implementer created additional fact sheets and marketing materials for the Program's new measures, specifically for attic insulation, air sealing, and the duct sealing pilot. These new materials provided customers with key information such as eligibility requirements, reward limits, Program descriptions, and how to get additional information.

The target audiences for CY 2013 marketing and outreach continued to be customers and Trade Allies, with a greater emphasis on Trade Ally outreach (similar to efforts in CY 2012). Implementer staff reported they did not change previous Trade Ally outreach tactics in CY 2013; they continued to use e-mail and direct mailings and to reach out through the Implementer's field representatives. Implementer staff reported that Trade Ally participation increased by more than 40% in CY 2013. Additional CY 2013 outreach included an annual Program-update webinar to inform Trade Allies of changes at the beginning of the year, though only one of the Trade Allies interviewed reported attending the webinar.

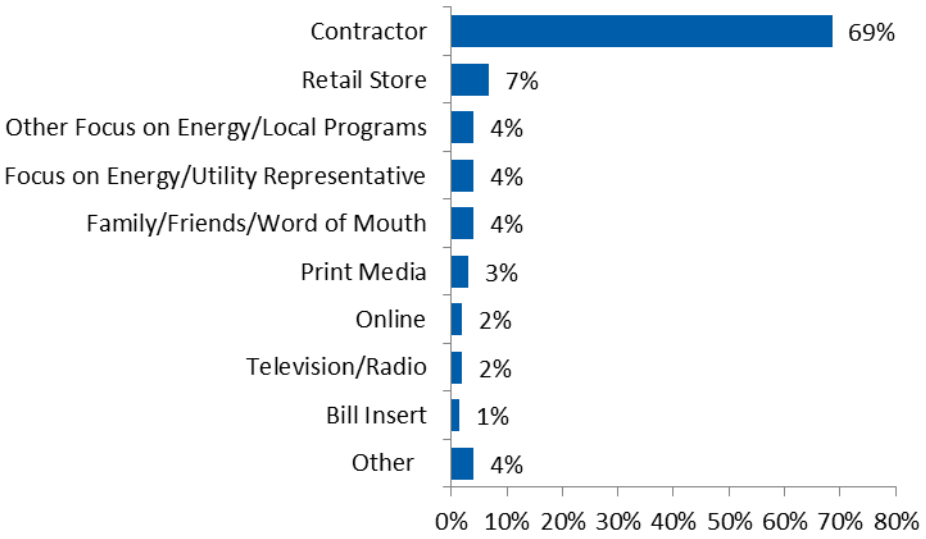
One of the participating contractors interviewed reported learning of the Program through Focus on Energy staff. Four other respondents said they learned of the Program through their supplier. The

remaining five respondents did not remember how they first learned of the Program—all five had participated in Focus on Energy's programs since the Program's inception.

All 10 of the participating contractors interviewed reported marketing the Program to their customers, primarily at the time they provided customers with a price quote. Only five of the 10 Trade Allies said they received marketing materials from Focus on Energy.

When asked what they consider to be the most successful customer marketing tactic, the interviewed contractors were unsure. Three of the participating contractors said that they market the Program most effectively. Customer survey findings support this statement; the Evaluation Team asked customers where they most recently heard about the Program and the majority (69%) reported learning of the Program through a contractor (see Figure 97).

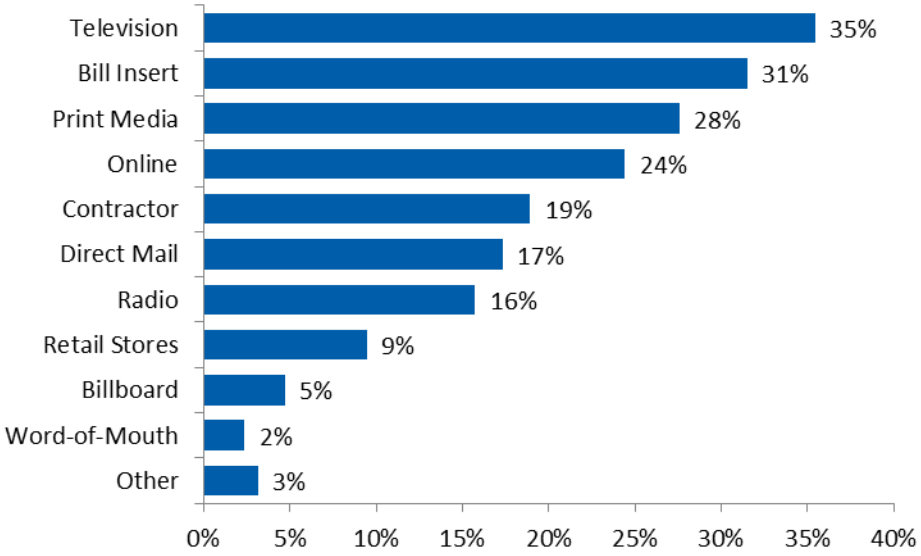
Figure 97. Where Customers Learned About the Program



Source: Participant Customer Survey: B1. "Where did you most recently hear about the Focus on Energy Residential Rewards Program?" (n = 134)

However, when asked how Focus could best inform the public about energy-efficiency programs, the majority of customers reported television and bill inserts.

Figure 98. Customer Preference for Learning of Energy-Efficiency Programs



Source: Participant Customer Survey: B7. "What do you think is the best way for Focus on Energy to inform the public about energy-efficiency programs?" (n = 127)

The Evaluation Team also asked participating customers if they were aware of any other Focus on Energy programs. Thirty-five percent of the customers said that they were familiar with other Focus on Energy programs. Most of those customers mentioned the Lighting and Appliance, Home Performance with ENERGY STAR, and Appliance Recycling Programs. Nineteen percent of customers surveyed reported they had previously participated in one of these other three programs.

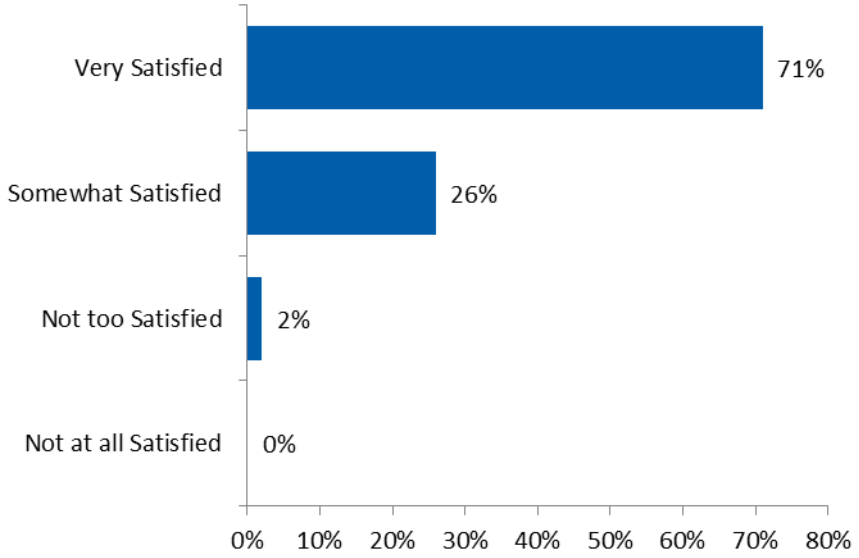
Customer Experience

Program Administrator staff said they received minimal customer feedback in CY 2013 and fewer customer complaints than in CY 2012. In addition, they reported that their own survey indicated high satisfaction with participation in the Program.[29]

The Evaluation Team's participant survey results showed that 97% of customers were satisfied with their CY 2013 Program participation, with most stating they were "very satisfied" (71%), as shown in Figure 99. Based on other evaluation and research, the Evaluation Team finds this satisfaction rating higher than typical energy-efficiency programs.

[29] The Program Administrator provided survey results as of October 2013 from a Focus on Energy postcard survey, which stated on a scale of "very satisfied" (5) to "very dissatisfied" (1). The average satisfaction rating from 805 Residential Rewards Program customers was 4.33.

Figure 99. Customer Satisfaction with the Residential Rewards Program



Source: Participant Customer Survey: D5. "How satisfied are you with Focus on Energy's Residential Rewards Program?" (n = 136)

The Evaluation Team benchmarked Program customer satisfaction against similar residential prescriptive programs. Table 115 shows that the Program has the same or higher reported customer satisfaction than the other programs reviewed.

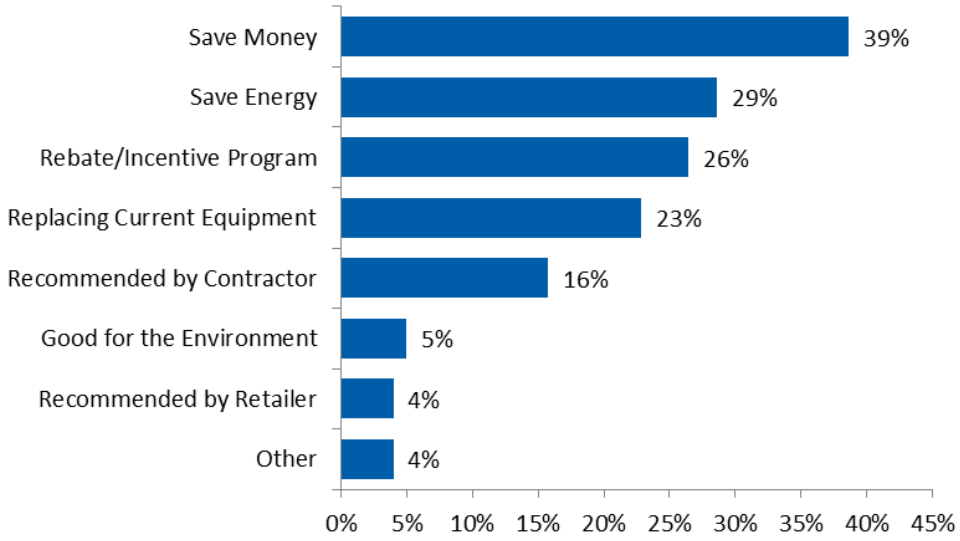
Table 115. Residential Rewards Program Benchmarking of Satisfaction Rates for Similar Programs

Utility	Satisfaction Rating
Focus on Energy	**97%**
Midwestern Utility A	97%
Midwestern Utility B	97%
Western Utility B	96%
Western Utility A	95%
Southern Utility B	94%
Southern Utility A	91%

Ninety-eight percent of customers reported they were satisfied with the reward amount they received through the Program, and 63% of the respondents said they were "very satisfied." Only two customers reported they wanted a larger reward. When asked how likely they would be to recommend the Program to a friend, on a scale of 0 to 10 with 10 being "very likely," 89% of the customers said they would be "very likely" to recommend the Program.

When asked what motivated them to participate in the Program, 39% of customers reported it was to "save money" (see Figure 100). Additional motivations customers reported included saving energy (29%), the rebate or incentive program (26%),[30] and replacing current equipment (23%).

Figure 100. Customer Participation Motivations



Source: Participant Customer Survey: C1. "What motivated you to participate in Focus on Energy's Residential Rewards Program and purchase your [Measure]?" (n = 140; multiple responses allowed)

The Evaluation Team asked customers what challenges they faced when trying to save energy in their homes. Thirty-seven percent of the respondents said they did not face challenges. A quarter of the respondents (25%) reported that having an older, inefficient home was their biggest challenge and 15% reported that they faced difficulty trying to control other household members' energy use. The remaining respondents reported challenges such as not having the money to invest in energy-efficient improvements (9%), having appliances and equipment with high energy use (4%), and having health or comfort issues that required higher energy use (2%). Seven percent of respondents reported they have already done what they could to save energy and the remaining respondents said they either do not know what to do or that energy efficiency is not a priority.

Eight of the 10 contractors interviewed said customers consider the high price of energy-efficiency equipment, even after the rebate, to be the main barrier to participation. The participating customer surveys found that 9% of customers agreed with that statement; those customers indicated that not having the money to invest in energy efficiency was a challenge.

[30] These responses included both the Residential Rewards Program rewards and other local or state incentives.

The Evaluation Team asked the surveyed customers if they had any suggestions for improving the Program; the majority of respondents (81%) said they did not. The few respondents who offered suggestions for improving the Program said to increase marketing and awareness (12%), increase incentives (4%) and simplify the application (3%).

ECM Use

Understanding how participants used furnace ECMs was a key objective for the CY 2013 evaluation. Early results from the first round of site visits conducted in CY 2012 revealed that the ECM savings were likely to be lower than anticipated because of longer fan use. A number of homeowners told the field technicians that they ran their fans only when their old furnaces were delivering heat. After they installed the new furnaces, homeowners said the dealers encouraged them to run the fans constantly for even heat distribution.

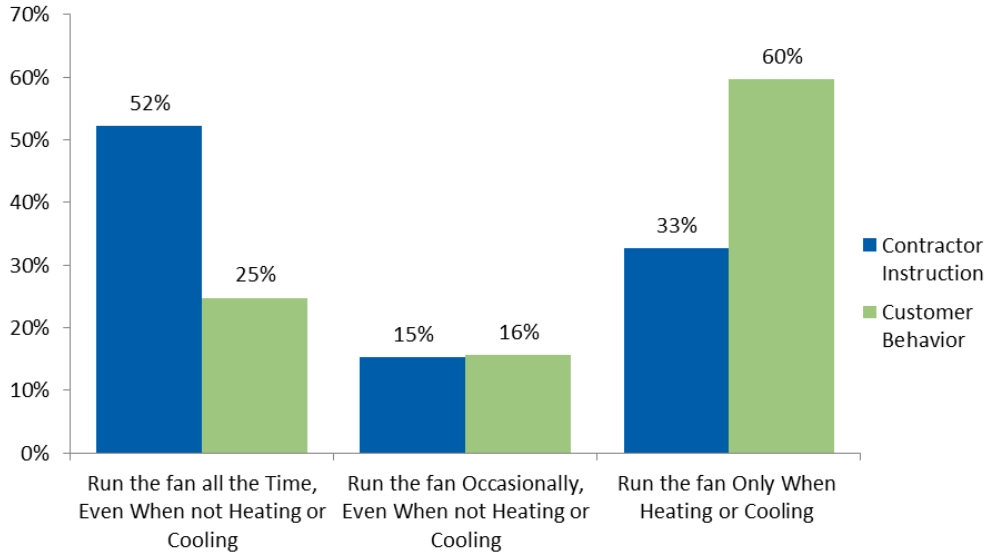
To address this issue in CY 2012, the Program Administrator took the following actions to inform customers and Trade Allies on furnace fan operation:

- Updated the call-center scripts with the correct instructions for furnace fan operation
- Updated the Trade Ally webpage including the FAQ section on furnace fan operation
- Informed the Program Administrator of training opportunities
- Included furnace fan operation in the field staff's outreach topics to Trade Allies
- Referred Trade Allies and customers to the Focus on Energy website HVAC fact sheets
- Issued customer marketing pieces including tips for furnace fan operation

In spite of the Implementer's educational efforts, the Evaluation Team collected anecdotal information through phone surveys from participating customers on both their behavior and their contractors' instructions. The majority of customers (52%) who installed a furnace with an ECM in CY 2013 reported that their contractor told them to run the fan at all times, even when not heating or cooling. However, only 25% of customers reported following that instruction, meaning that 60% of customers ran the blower only when heating or cooling (see Figure 101).[31]

[31] The Evaluation Team did not use these results to determine savings since it is in the process of metering participants' use of the ECMs (due to be completed midyear 2014).

Figure 101. Contractor Instruction and Customer Behavior on ECMs



Source: Participant Customer Survey: E2, E3. "What instructions did your contractor give?" and "Under what circumstances do you run the fan?" (n ≥ 58)

Trade Ally Experience[32]

It is not a requirement for contractors to be registered Trade Allies to participate in the Program. However, the Implementer encourages contractors to register as a Trade Ally to gain Program-specific benefits such as a listing on the Focus on Energy website, communications on Program changes and updates, and marketing materials. Eight of the 10 contractors interviewed were registered Trade Allies, one was not, and one did not know.

All of the participating contractors interviewed were satisfied with their participation in the Program; eight reported they were "very satisfied" and two reported they were "somewhat satisfied." This level of Trade Ally satisfaction is similar to what contractors reported in CY 2012.

When asked why they chose to participate in the Program, more than half of the contractors said it was to benefit their customers, who received cash back (see Table 116).

[32] Due to the small sample size, information presented about contractor experiences is anecdotal and not necessarily representative of the population of participating contractors.

Table 116. Contractor Program Participation Motivations

Participation Motivation	Number of Contractors
To benefit customers	6
Additional business	2
To keep up with other contractors	1
Customers request participation	1

Five of the interviewed contractors had participated in Focus on Energy's programs since their inception. The remaining contractors had participated in Focus on Energy programs for at least two years.

When asked whether participating in Focus on Energy programs generated business, six respondents stated their affiliation with Focus on Energy was "very helpful" and two stated it was "somewhat helpful" at generating business. Of the remaining two respondents, one said his affiliation was "not at all helpful" at generating business but he participated because his customers request participation and he was "very satisfied" with his Program experience. The remaining contractor did not know how helpful Focus on Energy was at generating business.

Though the Implementer offered Trade Allies the instant discount option for home heating and water heating applications in CY 2012, none of the eight registered Trade Allies interviewed were aware of that option. However, Implementer staff reported nearly 40 Trade Allies used the instant discount option in CY 2013. Implementer staff also said that the Trade Allies who did use it provided positive feedback, whereas those who did not use it reported they wanted to avoid the paperwork and required wait time to receive the reward. However, these Trade Allies also told the Program Implementer that if a customer is on the fence about purchasing an eligible measure and an instant discount could lock in the sale, then the Trade Allies would consider offering it.

In addition, Implementer staff said that since participation remained ahead of goals throughout the year, paying full price and waiting to receive the incentive did not appear to be a barrier to customer participation. Consequently, the Implementer did not consider instant discount marketing to be a priority.

The majority of interviewed contractors said they did not face any challenges or receive any customer complaints. One contractor said several of his customers reported receiving rebates faster than expected, so they were pleased with the Program. The few who did report challenges and/or complaints said the call center and the Program representatives provided conflicting information; they found it difficult to understand the equipment qualifications and their applications were returned due to incorrect information; and that their applications were delayed during the busy season, so it took longer to receive the reward.

Program Cost-Effectiveness

Evaluators commonly use cost-effectiveness tests to compare the benefits and costs of a demand-side management program. The benefit/cost (B/C) test used in Wisconsin is a modified version of the total TRC test. Appendix I includes a description of the TRC test.

Table 117 lists the CY 2011-2013 incentive costs for the Residential Rewards Program.

Table 117. Residential Rewards Program Incentive Costs

	CY 2013	CY 2012-2013
Incentive Costs	$ 6,451,477	$ 10,831,585

The Evaluation Team found the CY 2013 Program to be cost-effective (a TRC benefit/cost ratio above 1). Table 118 lists the evaluated costs and benefits.

Table 118. Residential Rewards Program Costs and Benefits

Cost and Benefit Category	CY 2013	CY 2012
Costs		
Administration Costs	$1,197,152	$673,316
Delivery Costs	$2,730,040	$1,535,462
Incremental Measure Costs	$20,714,367	$15,348,786
Total Non-Incentive Costs	$24,641,559	$17,557,564
Benefits		
Electric Benefits	$10,934,108	$11,921,705
Gas Benefits	$13,259,582	$16,491,191
Emissions Benefits	$5,048,142	$6,053,405
Total TRC Benefits	$29,241,832	$34,466,301
Net TRC Benefits	**$4,600,273**	**$16,908,738**
TRC B/C Ratio	**1.19**	**1.96**

Evaluation Outcomes and Recommendations

The Program had a successful year in CY 2013. The Program's closer alignment with the Enhanced Rewards Program helped to increase participation so that it surpassed its energy-efficiency products internal savings goals. Due to increased participation, the Program required a contract amendment to increase funding and internal energy goals to meet customer demand. Customers, participating contractors, and Trade Allies reported high satisfaction with the Program, and they made no notable complaints to Administrator or Implementer staff.

The Program continued to expand its offerings in CY 2013, adding new measures such as the furnace/air conditioner bundle and the attic insulation. The Program also added rebranded marketing materials that included the Enhanced Rewards Program offerings. Contractors marketed the Program directly to their

customers. Trade Ally and customer participation continued to increase and Administrator and Implementer staff developed additional plans for continued Program improvement in CY 2014.

The Evaluation Team identified the following outcomes and recommendations to improve the Program.

Outcome 1. Contractors are a main source of Residential Rewards Program awareness.

All interviewed contractors reported marketing the Program to their customers; contractors reported that the most successful marketing tactic was talking directly to a customer. Nearly 70% of interviewed customers said they heard about the Program through their contractor and nearly 20% said they thought the best way to learn about energy-efficiency programs offered by Focus on Energy is through contractors.

Recommendation 1. Continue to orient marketing and outreach toward Trade Allies, and ensure they are aware of all available resources that can support their Program marketing. Given the success Trade Allies have had marketing the Program, and the number of customers who reported that contractors were their main source of awareness, Focus on Energy should continue focusing marketing and outreach efforts on Trade Allies. The Program should both recruit more contractors to sign up as Trade Allies and continue to provide marketing materials that will encourage them to market the Program. Because the surveyed Trade Allies did not know about the instant discount option in CY 2013, the Program should consider increasing Trade Ally outreach around that option. If Trade Allies know about the instant discount, they will have another option to help them sell the Program to customers.

Outcome 2. The Program had a strong year in CY 2013, and surpassed its overall Program energy-savings goals, even while fewer than expected customers installed the newly available attic insulation measure.

More customers installed attic insulation during the last quarter of CY 2013, but the small number of qualified Trade Allies limited how widely the option could be offered. Current Home Performance with ENERGY STAR Program Trade Allies are preapproved to install attic insulation through the Residential Rewards Program, but few are actually doing so.

Recommendation 2. Take action to recruit more Trade Allies to install attic insulation, and increase marketing to those who already qualify. Focus on Energy should conduct targeted marketing to eligible Home Performance with ENERGY STAR Program Trade Allies, focusing on the benefits of offering the measure through the Residential Rewards Program. In addition, Focus on Energy should consider including additional budget to provide training to other qualified Trade Allies, which will increase the number of Trade Allies eligible to market the measure and ensure broader customer coverage throughout Wisconsin.

Outcome 3. Despite Focus on Energy's education efforts, contractors continued to provide incorrect instructions for running an ECM motor.

According to customer surveys, 67% of customers reported receiving instructions from their contractor to run their ECM motor all the time, or occasionally, even when not heating or cooling.

Recommendation 3. Increase contractor education on ECM motor use. Focus on Energy should continue contractor awareness and education efforts on appropriate ECM motor use. This can include the current tactics of providing information through the call center, Trade Ally webpage, fact sheets, and field-staff outreach as well as new materials such as customer leave-behinds that provide instructions on proper fan use. In addition, consider conducting QA/QC site visits during installation to ensure Trade Allies are providing proper instructions to their customers.

Outcome 4. Customers still find application requirements difficult to understand.

Trade Allies reported the application process to be easy. But, they also said that their customers found the application to be difficult, so nearly all the Trade Allies interviewed helped their customers complete the applications. Three percent of surveyed customers found the application process to be difficult and suggested Focus on Energy simplify the application. While the application process is not a significant barrier to Program participation, customers continue to report it is a challenge.

Recommendation 4. Continue with plans to implement an online application in CY 2014. As noted in the CY 2012 evaluation, an online application will make it easier for customers and Trade Allies to submit applications and will help to reduce data transcription errors.

Enhanced Rewards Program

The Enhanced Rewards Program encourages income-eligible residents to increase the energy efficiency, affordability, and comfort of their homes by offering incentives for replacing older or failed home heating equipment with high-efficiency units.

The Program targets customers who earn from 60% to 80% of the SMI. These customers may be financially unable to participate in the Program but do not qualify for, or choose not to participate in, the Wisconsin Weatherization Assistance Program or the Home Energy Plus program offered by the Wisconsin Department of Administration. In 2013, the Implementer worked with the Department of Administration to deliver the Program to customers who qualified for emergency furnace replacement through Home Energy Plus.[33]

The Program was first implemented in CY 2012 under the name Home Heating Assistance Program. In CY 2013, the Program Implementer aligned the Program more closely with the Residential Rewards Program and changed its name to Enhanced Rewards. The Implementer combined marketing efforts and now presents both programs jointly to customers and Trade Allies. The Implementer also added an air conditioning bundling option to the measure list and modified the income-qualification application to allow customers to submit tax returns instead of pay records.[34]

[33] Home Energy Plus is an overarching program that administers the heating assistance and weatherization programs (WHEAP – Wisconsin's Home Energy Assistance Program and Weatherization Assistance Program).

[34] Participants receiving the air conditioner bundling option must also receive a furnace replacement.

Table 119. Enhanced Rewards Program Actuals Summary[1]

Item	Units	CY 2013 Actual Amount	CY 2012-2013[2] Actual Amount
Incentive Spending	$	$1,203,175	$1,358,325
Verified Gross Life-Cycle Savings	kWh	13,739,050	15,637,199
	kW	278	310
	Therms	4,130,468	4,589,830
Net Annual Savings	kWh	597,350	679,878
	kW	278	310
	Therms	180,187	200,232
Participation	Homes	1,313	1,511
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	2.11	0.77 [3]

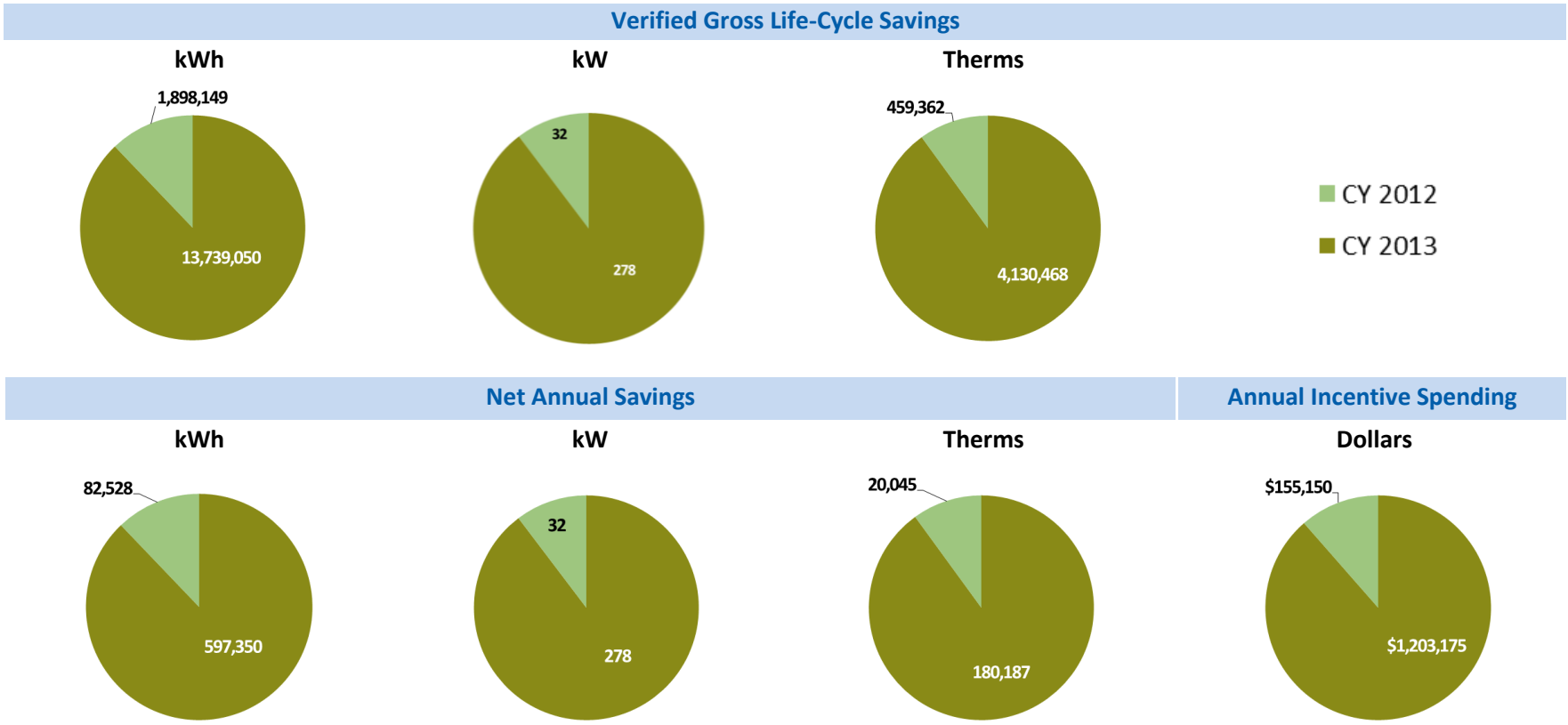
[1] This table presents gross life-cycle savings to allow comparison with Focus on Energy's quadrennial gross life-cycle savings target, and net annual savings to allow assessment of the Program Administrator and Program Implementer's achievement of net annual savings.

[2] The Program launched in 2012.

[3] The cost-effectiveness ratio is for CY 2012 only.

Figure 102 presents the savings and spending progress made in 2012 and 2013. The Program launched in CY 2012, exceeded project goals in CY 2013 and is on target to meet its quadrennial goal.

Figure 102. Enhanced Rewards Program Two-Year (2012-2013) Savings and Spending Progress



Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted the following impact and process evaluations for CY 2013:

- What are the gross and net electric and gas savings?
- How can the Program increase its energy and demand savings?
- What are the barriers to increased customer participation and how effectively is the Program overcoming those barriers?
- How is the Program leveraging the current supply chain for measures and what changes can increase the supply chain's support?
- What is customer satisfaction with the Program?

The Evaluation Team designed its EM&V approach to integrate multiple perspectives in assessing Program performance. Table 120 lists the specific data collection activities and sample sizes used.

Table 120. Enhanced Rewards Program CY 2013 Data Collection Activities and Sample Sizes

Activity	CY 2013 Sample Size (n)	CY 2011-2013 Sample Size (n)
Tracking Database Review	Census (1,313 homes)	Census (1,511 homes)
Participant Surveys	70	70
Nonparticipant Surveys	2	2
Participant Trade Ally Interviews	8	8
Stakeholder Interviews	2	2

Data Collection Activities

The Evaluation Team collected data through surveys and interviews with a sample of participating and nonparticipating customers and Trade Allies:

- **Telephone survey of participating customers.** The Evaluation Team worked with St. Norbert's College Strategic Research Institute to conduct the survey in November 2013. The survey used a simple random sample of customers who participated in the Program between January 1, 2013, and November 12, 2013.
- **Telephone survey of nonparticipant customers.** The Evaluation Team used a list of inactive customers provided by the Program Implementer. Inactive customers are defined as those who had submitted an income-qualification application, but had not yet participated in the Program. The Evaluation Team attempted each of the 13 customers at least four times but was only able to reach two respondents.[35]

[35] The Evaluation Team encountered two disconnects and one customer with a language barrier. Two of the 13 customers completed the interview.

- **Telephone interviews of random samples of participating and nonparticipating Trade Allies.** The Evaluation Team defined participating Trade Allies as those who completed a project in the Program in CY 2013, while nonparticipating Trade Allies were defined as those who did not complete a project during CY 2013.

Impact Evaluation

To calculate gross savings, the Evaluation Team reviewed tracking data in the Program database (SPECTRUM). To calculate net savings, the Evaluation Team leveraged applicable findings from SPECTRUM and the Implementer's database.

Evaluation of Gross Savings

This section describes how the Evaluation Team assessed gross Program savings.

Tracking Database Review

The Evaluation Team reviewed the CY 2013 data contained in SPECTRUM for completeness and quality, and found that these data were thorough and complete; SPECTRUM contained all of the data fields necessary to verify Program savings. The Evaluation Team identified no missing savings values, no duplicate savings for measures installed under the Program, and no duplicate participants.

The Program Implementer used an adjustment measure to correct savings that had already been recorded in the database. This adjustment changed the total CY 2013 savings by 1,500 kWh, 0.6 kW, and 23,704 therms, equal to 11.8% of the Program's overall annual energy (MMBtu) savings.

It is not possible to determine from available documentation or data contained in SPECTRUM exactly why the adjustment measure was applied. The Program Administrator reported that it typically resulted when an application was processed in the Residential Rewards Program but the applicant actually qualified for the Enhanced Rewards Program. Other possibilities are that the Implementer may have discovered additional installations of measures that had not been included previously or vice versa or may have corrected improper deemed savings values used in the database.

Gross and Verified Gross Savings Analysis

In addition to reviewing the Program database, the Evaluation Team used deemed assumptions to review the measure-level savings.

Engineering Review

To validate the tracked deemed savings for the Program, the Evaluation Team relied on:

- Assumptions from the deemed savings values previously used by the Program Implementer
- Program tracking database, which contains deemed measure-level savings

The Evaluation Team also conducted a metering study to assess energy savings and demand reductions associated with the optional installation of ECM fans. Participants receiving measures with an ECM were provided additional incentives.

ECM Metering Study

Energy savings and demand reductions associated with installing ECM fans depend heavily on how participants use the fan; anticipated savings decrease if the fan runs longer than the furnace runs. Some manufacturers claim energy savings can be as high as 80% if existing permanent split capacitor indoor blower motors are replaced with high-efficiency indoor blower motors (ECM blowers).

In order to measure the energy use of ECM blowers installed through the Residential Rewards Program, the Evaluation Team installed meters on 30 furnaces in Wisconsin in February 2012. Twenty-three of the participants opted to leave the meters installed for another year. The Evaluation Team installed an additional 56 meters in participant homes in the fall of 2013, which provides data on a total of 109 furnaces.

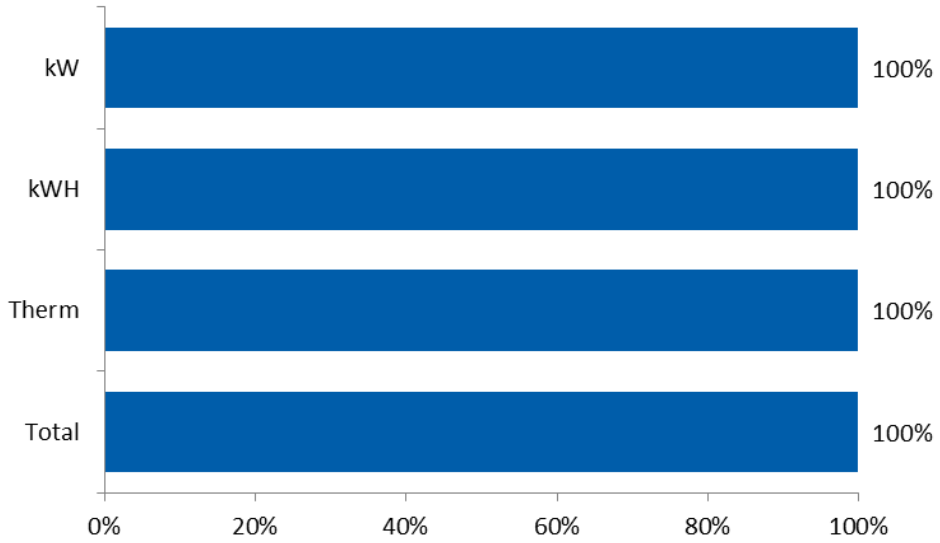
Note that the meters installed in the fall of 2013 will remain in place through the end of March 2014 to capture the 2013-2014 heating season, as a result, the findings from this study component will not be available in time for inclusion in the CY 2013 evaluation report. The Evaluation Team will submit an interim memo in June 2014 to present the final findings of the study, which will then be used to update energy and demand savings for ECM fans installed through the Enhanced Rewards Program. These results will also be summarized in the CY 2014 evaluation.

Realization Rates

Overall, the Program achieved a verified realization rate of 100%. The Evaluation Team verified that the gross savings reported in the Program tracking database have been achieved in accordance with the Program operating criteria and previously agreed upon evaluation criteria.

Figure 103 shows the realization rate by fuel type.

Figure 103. Enhanced Rewards Program Realization Rate by Fuel Type



Gross and Verified Gross Savings Results

Table 121 lists the total and verified gross savings, by measure type, achieved by the Program in CY 2013. Annual *ex ante* energy and demand savings from the tracking database are equal to the annual *ex post* savings.

The Evaluation Team found that there was a 0.04% difference in *ex ante* versus *ex post* life-cycle therms After August 17, 2013, the SPECTRUM database used an EUL of 19 for the Hot-Water Boiler measure. Prior to August 17, the database had used an EUL of 20, which matched the PSC's EUL database. The Evaluation Team applied the PSC's EUL database[36] in the *ex post* analysis.

In one instance, the liquid propane (LP) or Oil Furnace with ECM reported life-cycle therm savings, which was most likely a data entry error. The Evaluation Team believes this to be a data entry error since no other instance of the measure recorded therm savings and thus removed the savings from the *ex post* analysis.

[36] Dated January 2013.

Table 121. Enhanced Rewards Program Gross Savings Summary

Measure Type	Gross Life-Cycle			Verified Gross Life-Cycle		
	kWh	kW	Therms	kWh	kW	Therms
Natural Gas Furnace - 90% AFUE			510,094			510,094
NG Furnace with ECM - 90% AFUE	7,797,000	136	2,443,796	7,797,000	136	2,443,796
LP or Oil Furnace with ECM – 90%+ AFUE (Existing)	1,058,000	18		1,058,000	18	
Furnace and AC with ECM – 95%+ AFUE >=16 SEER	2,584,050	84	317,975	2,584,050	84	317,975
Hot-Water Boiler - 90% AFUE, <300 MBtu/h			43,580			43,580
Adjustment Measure	34,500	1	545,192	34,500	1	542,192
Measures Funded by Department of Administration						
NG Furnace with ECM - 95% AFUE	1,874,500	33	221,191	1,874,500	33	221,191
LP or Oil Furnace with ECM - 95% AFUE	391,000	7		391,000	7	
Hot-Water Boiler >= 95% AFUE, <= 300 MBtu/h			48,640			48,640
Total Life-Cycle	**13,739,050**	**278**	**4,130,468**	**13,739,050**	**278**	**4,130,468**

Evaluation of Net Savings

Net-to-Gross Analysis

Similar to CY 2012, the Evaluation Team did not conduct a net-to-gross analysis during the CY 2013 evaluation. The Evaluation Team has experienced that net-to-gross ratios and spillover are not influential factors in similar income-eligible programs. The PSC accepted a net-to-gross ratio of 1 for all income-qualified programs in the Program Specific Evaluation Plans for CY 2013. As such, the Evaluation Team applied a net-to-gross ratio of 1.

Net Savings Results

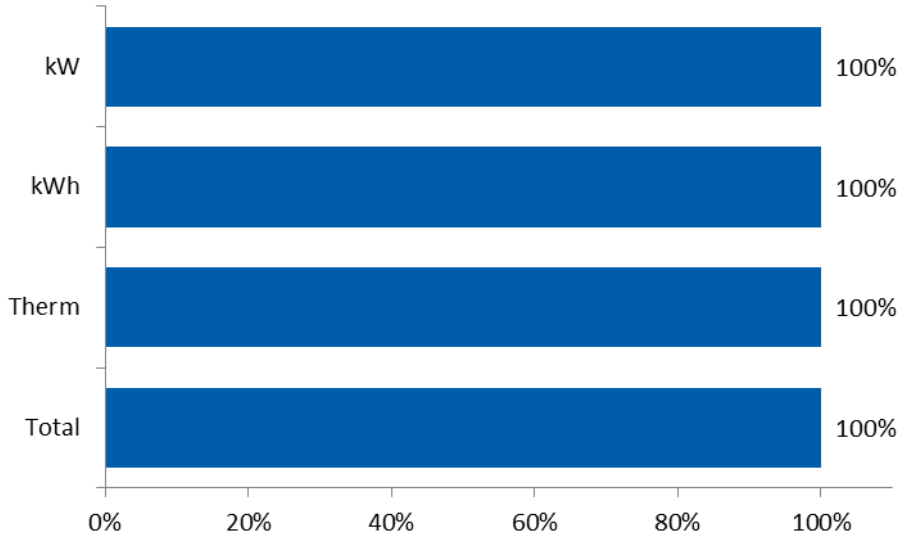
Table 122 shows the Program's net energy impacts (kWh, kW, and therms). The Evaluation Team attributed these savings to be net of what would have occurred without the Program.

Table 122. Enhanced Rewards Program Net Savings

Measure Type	Verified Net Annual		
	kWh	kW	Therms
NG Furnace - 90% AFUE			22,178
NG Furnace with ECM - 90% AFUE	339,000	136	106,252
LP or Oil Furnace with ECM – 90%+ AFUE (Existing)	46,000	18	
Furnace and AC with ECM – 95%+ AFUE and >=16 SEER	112,350	84	13,825
Hot-Water Boiler - 90% AFUE (<300 MBtu/h)			2,179
Adjustment Measure	1,500	1	23,704
Measures Funded by Department of Administration			
NG Furnace with ECM - 95% AFUE	83,500	33	18,871
LP or Oil Furnace with ECM - 95% AFUE	17,000	7	
Hot-Water Boiler >= 95% AFUE (<= 300 MBtu/h)			2,432
Total Annual	**597,350**	**278**	**180,187**

Figure 104 shows the net savings as a percentage of the *ex ante* gross savings by fuel type.

Figure 104. Enhanced Rewards Program Net Savings as a Percentage of *Ex Ante* Savings by Fuel Type



Process Evaluation

To evaluate the Program's performance and opportunities for improvement, the Evaluation Team reviewed Program materials and obtained the perspectives of the Program Administrator, Program Implementer, and participating contractors and customers through interviews and surveys. The Evaluation Team assessed and evaluated the Program's status and changes in CY 2013, its processes and management, and Trade Ally and customer participation experiences and satisfaction.

The Evaluation Team focused on CY 2013 Program changes. Key recommendations from the CY 2012 evaluation were to:

- Increase the use of focused marketing campaigns (similar to the campaign conducted in July 2012) and pursue marketing in conjunction with the Residential Rewards Program to increase customer and Trade Ally awareness of the Program.
- Investigate the impacts associated with offering the instant discount option to Trade Allies because this option could help sell the Program to customers.[37]

Program Design, History, and Goals

At the beginning of CY 2013, the Program Administrator and Program Implementer made three key changes to the Program:

- Changed the Program's name from Home Heating Assistance Program to Enhanced Rewards Program in order to increase alignment of the Program with the Residential Rewards Program.
- Aligned the Program's marketing and outreach efforts with the Residential Rewards Program.
- Partnered with the Wisconsin Department of Administration to provide the state agency with funding to install Program-qualified HVAC measures in homes of customers who needed emergency replacements.

Program participation was high in CY 2013's final months. The Program Implementer reported that the Program exceeded its targets and required additional funding to pay out the additional incentives. The Program Administrator approved the additional funding, and the Program Implementer stated that all applications approved in CY 2013 were processed by the end of the year.

Program Management and Delivery

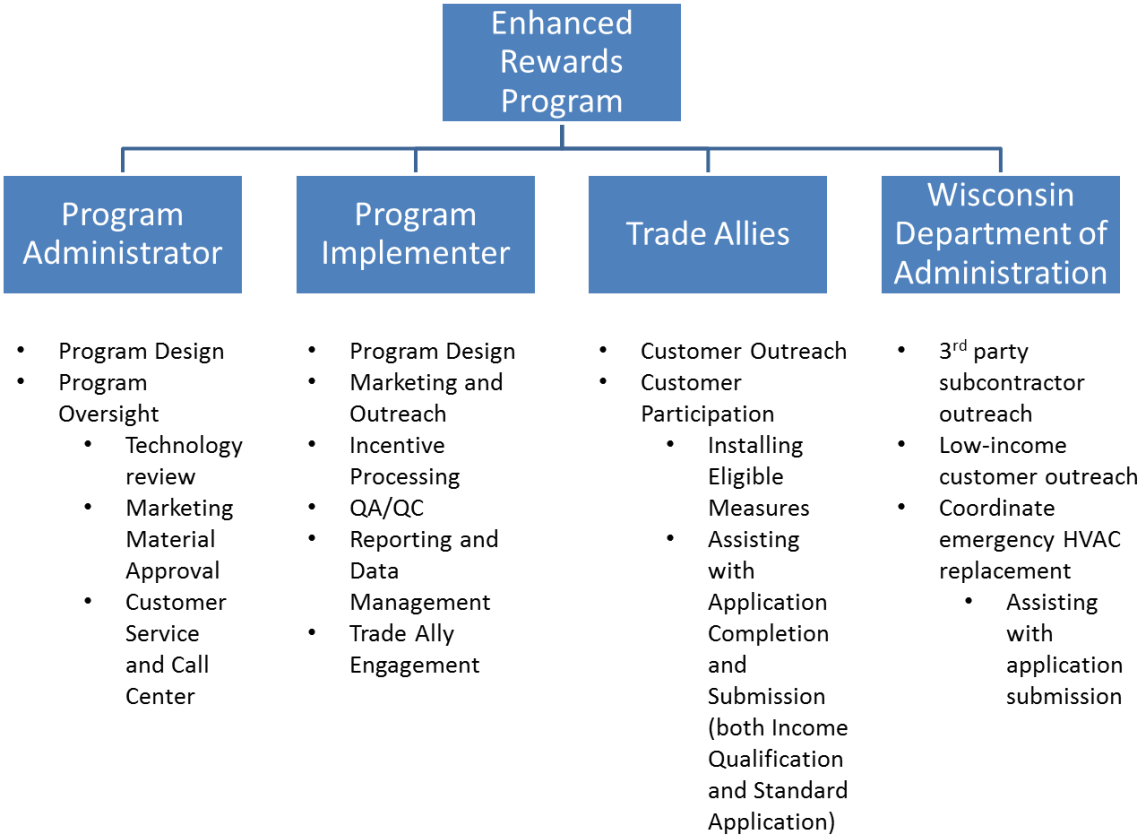
This section describes the Evaluation Team's assessment of various Program management and delivery components.

Management and Delivery Structure

The Program's management and delivery structure in CY 2013 changed only slightly from the previous year with the addition of the Wisconsin Department of Administration. There were no changes to the roles of either the Program Implementer or the Program Administrator. Key Program actors and their roles are shown in Figure 105.

[37] The instant discount option allows Trade Allies to offer the Focus on Energy reward amount as a discount on the customer's invoice. Focus on Energy then reimburses the Trade Allies for the reward amount. The Evaluation Team did not examine the impact of the instant discount on the Program in CY 2013 because it was examined in the Residential Rewards Program evaluation.

Figure 105. Enhanced Rewards Program Key Program Actors and Roles



The joint venture with the Wisconsin Department of Administration impacted the Program's CY 2013 performance. The Program provided customers whose SMI was less than 60% and who needed an emergency HVAC replacement with a 95% AFUE unit with ECM at no cost to the customer. A Department of Administration contractor performed the installations, and the Program paid rebates directly to the contractor.

The Program received credit for savings and participation through this Department of Administration delivery mechanism. These installations accounted for 16% of kWh savings and 7% of therms savings in CY 2013.

Key Program Processes

The Program verifies income eligibility, which requires that customers complete an additional application. This is a paper application completed by the customer with help from the contractor. In CY 2013, the Program Implementer modified the income-qualification application to allow customers to provide tax return information rather than having to verify three months of income (although the latter can still be used). This change, according to the Program Administrator, significantly decreased the number of incomplete applications (the Evaluation Team did not verify this change).

Customers using the standard Program enrollment process (not through the Department of Administration) completed both the Program application as well as the income-qualification application on their own or with Trade Ally assistance.

The Department of Administration partnership began early in CY 2013 to help the Program achieve its total savings goal. This effort was led by the Program Administrator.

However, the higher-than-expected participation through the Program's standard application process prompted the Implementer to re-evaluate the Department of Administration's role. In a follow-up interview with the Evaluation Team, the Program Implementer stated it originally thought the emergency installations through the Department of Administration would account for approximately 30% of total Program savings.

But by the end of the year, these installations accounted for only 16% of kWh savings and 7% of therms savings. The Implementer considered this lower portion of Department of Administration a success, because it reflected higher participation in the standard application process. Because the Program has done so well, the Implementer's planned target for Department of Administration installations in CY 2014 will cover only the CY 2013 carryover installations.

Program Data Management and Reporting

The Program Implementer is responsible for all data entry into SPECTRUM. The application influx led the Program Implementer to hire additional temporary staff to meet demand. According to the Program Administrator, the combination of new staff and high application volume resulted in more data entry errors.[38]

The Program Implementer compared application data errors from both the Residential Rewards Program and the Enhanced Rewards Program. In CY 2012, there were 48 internal errors out of 15,259 applications; in CY 2013, there were 54 errors out of 24,230 applications. The overall error rate fell from 0.31% to 0.22%.

In CY 2013, the Program Implementer updated the SPECTRUM database by adding fields for the specific make and model of the HVAC unit installed. The installed units were on a preapproved list in a drop-down selection in SPECTRUM, which prompted more consistent data entry across all participants. Both the Program Implementer and Program Administrator expressed satisfaction with this improvement to SPECTRUM's functionality from CY 2012.

[38] These errors did not affect reported energy savings, but may have contributed to adding adjustment measures to the database.

Program Materials

In CY 2013, the Program Administrator and Program Implementer aligned the printed marketing materials and presentation to customers of both the Enhanced Rewards Program and Residential Rewards Program. According to the Implementer, this alignment was a primary driver for increasing both programs' customer participation. The combined CY 2013 marketing materials displayed both rewards options—income-qualified and standard-income—so customers could determine which program they qualified for.

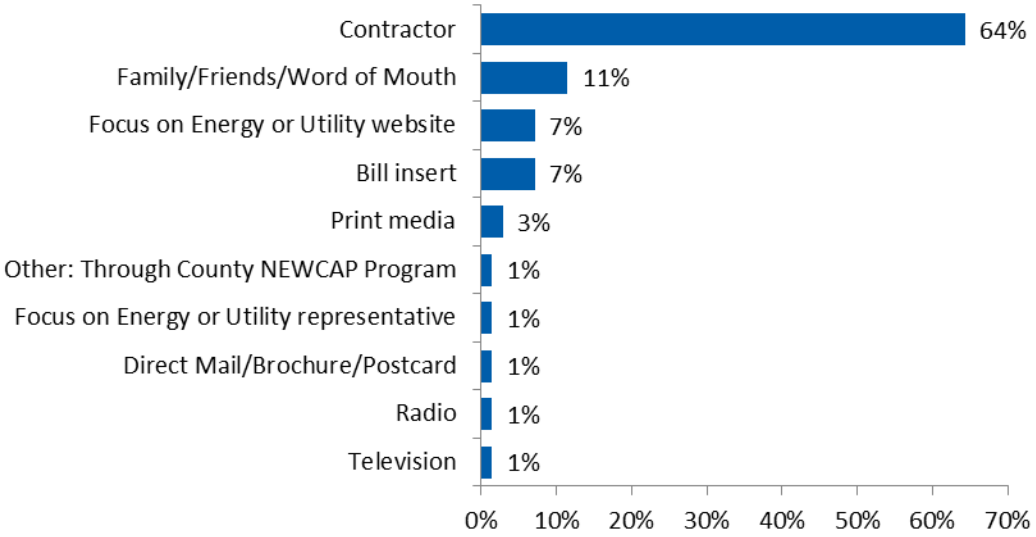
The revised marketing materials made it easier for Trade Allies to compare the programs and explain options to their customers. In CY 2012, Trade Allies reported that the stigma of needing assistance reduced Enhanced Rewards Program customer participation. The redesigned materials addressed this concern by directly presenting both programs to potential customers. The Program website also presents the programs as one; then instructs customers, once they begin the application process, to check an income-qualification chart to see if they are eligible for an Enhanced Reward.

Marketing and Outreach

The Program is delivered primarily through Trade Allies. In CY 2012, the Program Implementer stated that Trade Allies were reluctant to address income with their customers. In CY 2013, the Program Implementer expressed similar concerns during an interview with the Evaluation Team. However, only two of the eight Trade Allies interviewed in CY 2013 said that discussing income qualifications with customers presented a challenge. As noted above, the Program Implementer reported that aligning the marketing materials for the two programs may have alleviated this challenge in CY 2013.

According to the surveyed participants, Trade Allies were a key source of information about the Program. As shown in Figure 106, the majority of customers heard about the Program from Trade Allies.

Figure 106. Where Customers Heard about the Enhanced Rewards Program



Source: Customer Participant Survey Question B1: "Where did you most recently hear about the Focus on Energy Enhanced Rewards Program?" (n=70)

In fall 2012, the Program Implementer launched a successful marketing campaign using newspaper advertising, targeted mailers, and follow-up phone calls to Trade Allies. This campaign helped boost participation during the fall heating season. The Program launched a similar campaign in October 2013. The Program Implementer reported that website traffic during this campaign reached its highest point ever, with 400 hits to the combined Residential Rewards Program and Enhanced Rewards Program page in a single day.

According to survey results, 83% of participating respondents (57 of 70) were not aware of the Program before learning about it from their Trade Ally. The Program Implementer and the Trade Allies were very effective in promoting the Program and enrolling customers.

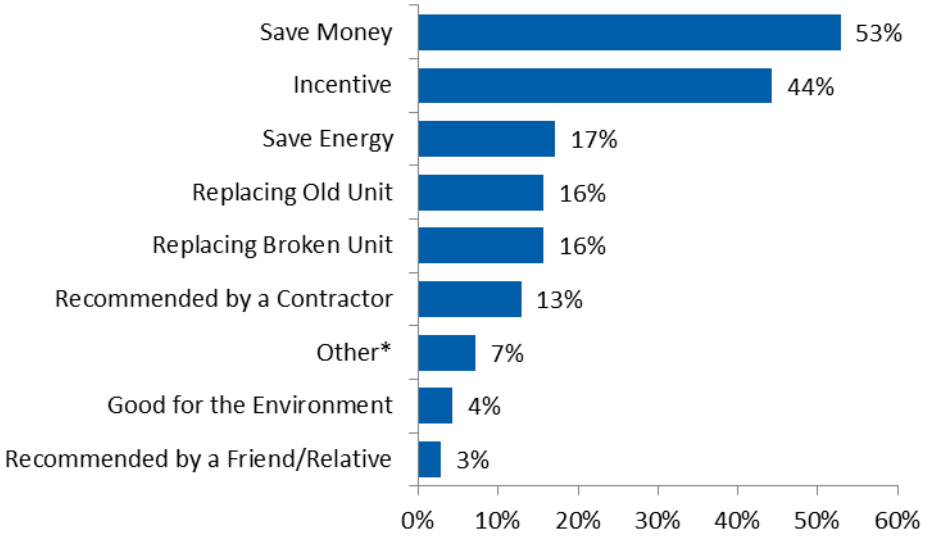
Customer Experience

The Evaluation Team surveyed 70 participating customers and conducted interviews with two nonparticipants to learn about their decision-making and satisfaction with the Program.[39]

Customers said the primary reason they participated in the Program was to save money on energy costs and receive an incentive (Figure 107).

[39] The Evaluation Team sampled 13 customers who submitted an income qualification application but did not sign up for the Program. Each contact was attempted up to four times.

Figure 107. Enhanced Rewards Program Customer Participation Motives



Source: Customer Participant Survey Question C1: "What motivated you to participate in Focus on Energy's Enhanced Rewards Program and install your furnace?" (n=70, multiple responses allowed)

Customers also offered several responses that did not fit into the categories listed in Figure 107 above. These included:

- "I didn't have a furnace for the winter and I needed one."
- "I didn't like the fuel. I didn't like using oil."
- "Qualifying furnace was in stock."
- "The brand of furnace. I go by ratings of brands."
- "The quality of the furnace and the price."

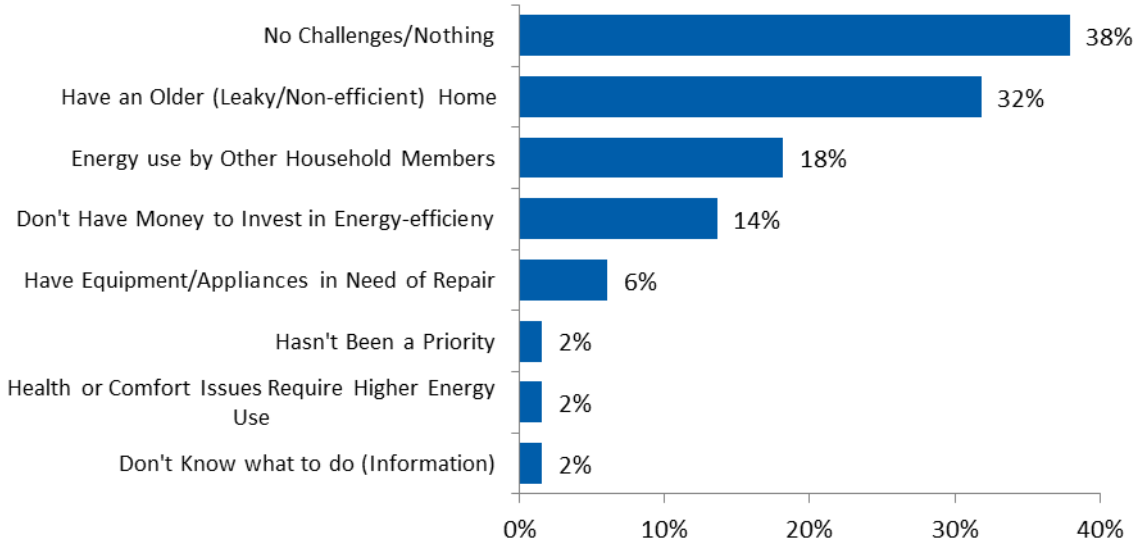
The Evaluation Team spoke with two customers who did not participate for different reasons. One stated that he or she did not qualify for the Program, while the other stated that he or she had misplaced the paperwork and the deadline had passed.

The Evaluation Team asked survey respondents what challenges they faced both to saving energy in their home and to installing the new furnace. Figure 108 shows their responses.

While 38% of customers indicated there was "no challenges/nothing" to saving energy, 32% said their home's condition made saving energy a challenge. Home condition affected customers' decision to purchase; 42% of customers indicated their home's condition was a concern in installing an energy-efficient furnace (Figure 109).

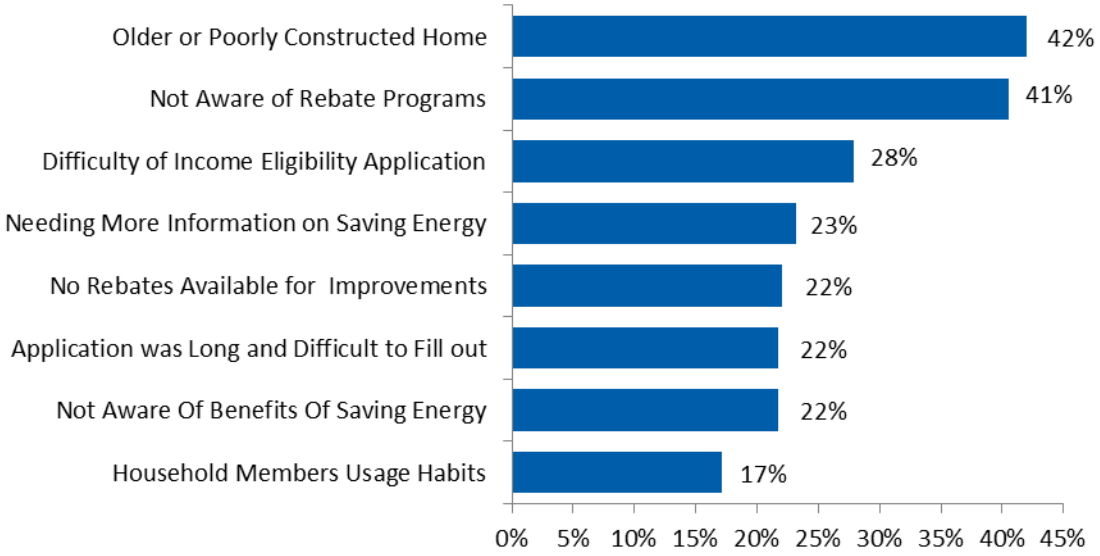
Program awareness was the second largest challenge. Customers were not aware of the Program before learning about it from Trade Allies; therefore, they saw their lack of knowledge as a barrier. Approximately one-third of the respondents indicated the income-qualification application posed a challenge because of its length and requirements.

Figure 108. Enhanced Rewards Program Customer Challenges to Saving Energy



Source: Customer Participant Survey Question C4: "What challenges, if any, make saving energy difficult in your home?" (n=66, multiple responses allowed)

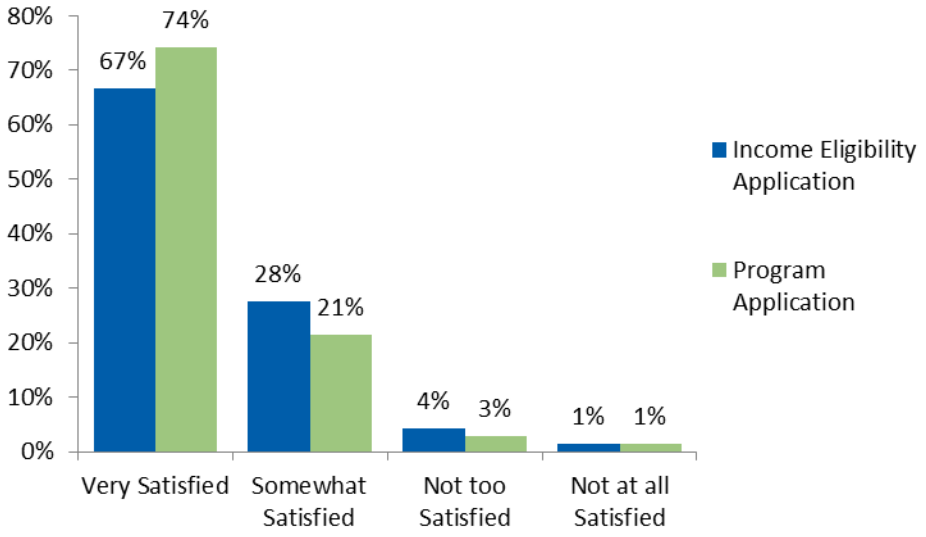
Figure 109. Challenges to Installing an Energy-Efficient Furnace



Source: Customer Participant Survey Question C5: "Did you face any of the following challenges when deciding to install your new furnace?" (n≥68, chart shows "yes" responses)

Customer satisfaction with the Program and its processes was very high. Figure 110 shows satisfaction with the two Program applications.

Figure 110. Satisfaction with Enhanced Rewards Program Application Processes



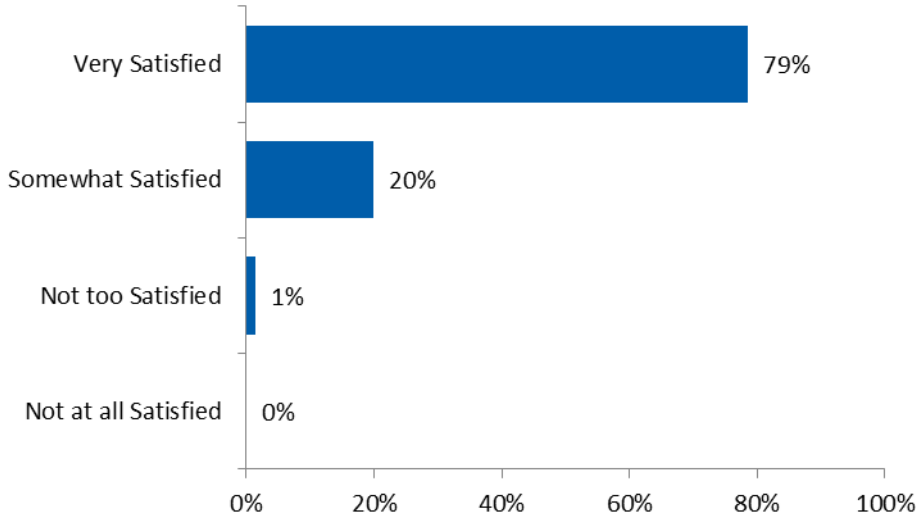
Source: Customer Participant Survey Question D1 & D3: "How satisfied are you with the Enhanced Rewards Cash Back application Process?" and "Specifically regarding the Enhanced Rewards Eligibility Application, how satisfied are you with that?" (n≥69)

Overall, customers were satisfied with the two application processes; only 5% were dissatisfied with the income-qualification application process and 4% were dissatisfied with the Program application process.

Customers who expressed dissatisfaction were asked to provide a reason for their dissatisfaction; customers were dissatisfied with the income-qualification application because of the documentation required to prove eligibility. Customers were dissatisfied with the Program application because of its length and the time it took to complete it.

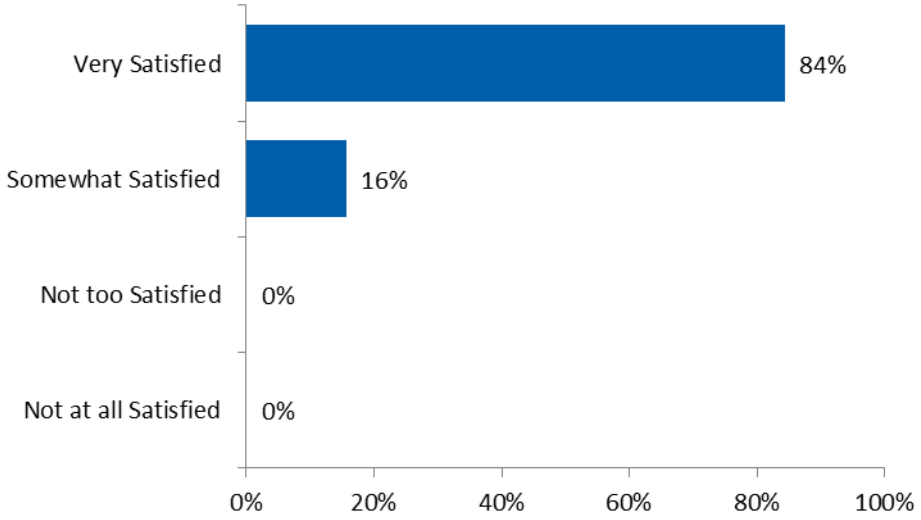
Figure 111 and Figure 112 show high customer satisfaction with the rebate amount and with the Program overall. No customers expressed dissatisfaction with the Program overall.

Figure 111. Satisfaction with the Enhanced Rewards Program Rebate



Source: Customer Participant Survey Question D5: "How satisfied are you with the amount of the reward that you received through the Enhanced Rewards Program?" (n=70)

Figure 112. Satisfaction with the Enhanced Rewards Program Overall



Source: Customer Participant Survey Question D7: "How satisfied are you with Focus on Energy's Enhanced Rewards Program?" (n=70)

The Evaluation Team asked customers if they have any suggestions for improving the Program. Twenty-seven respondents out of 70 offered a suggestion. Twelve participants recommended increasing consumer awareness of the Program, and eight mentioned improving the application process.

Trade Ally Experience

The Evaluation Team interviewed 16 registered Trade Allies, eight of whom participated in CY 2013 and eight of whom did not. Because of the small sample sizes, the results of these interviews do not statistically represent the Trade Ally population, but they do offer anecdotal insight on the Trade Ally perspective.

Six of the eight participating Trade Allies found out about the Program from a Focus on Energy representative.[40] Contractors participated for one of two reasons: to increase their business or to help the customer. Two of the eight participants mentioned both reasons.

Participating Trade Allies marketed the Program to customers in a variety of ways, including radio, TV, and traditional print media. Two Trade Allies stated they do not market the Program at all. Six stated they received materials such as fact sheets and brochures from Focus on Energy to market the Program. None of these six Trade Allies expressed dissatisfaction with the materials.

[40] Respondents did not specify which representative of Focus on Energy.

Only three of the eight nonparticipating Trade Allies received materials from Focus on Energy to market energy-efficiency programs. (Due to the small sample size, the Evaluation Team cannot draw any conclusions about the information received by population of Trade Allies.) Of these three, two used the materials. One of these two Trade Allies stated the materials were "somewhat useful" and the other said they were "not too useful."

Overall, participating Trade Allies were satisfied with the Program and its features. No Trade Ally expressed dissatisfaction (either "not too satisfied" or "not at all satisfied") with the Program overall. All eight participating Trade Allies believed customers were satisfied as well.

Only one of the eight participating Trade Allies mentioned any barriers to customer participation; this Trade Ally considered Program paperwork to be a barrier for their customers.

When asked about the primary barrier for customers in installing high-efficiency equipment, seven of the eight nonparticipants stated it was the increased high-efficiency measure cost.

Program Cost-Effectiveness

Evaluators commonly use cost-effectiveness tests to compare the benefits and costs of a demand-side management program. The benefit/cost (B/C) test used in Wisconsin is a modified version of the TRC test. Appendix I includes a description of the TRC test.

Table 123 lists the CY 2011-2013 incentive costs for the Enhanced Rewards Program.

Table 123. Enhanced Rewards Program Incentive Costs

	CY 2013	CY 2012-2013
Incentive Costs	$1,203,175	$1,358,325

The Evaluation Team found the CY 2013 Program to be cost-effective (a TRC benefit/cost ratio above 1). Table 124 lists the evaluated costs and benefits.

Table 124. Enhanced Rewards Program Costs and Benefits

Cost and Benefit Category	CY 2013	CY 2012
Costs		
Administration Costs	$207,913	$203,020
Delivery Costs	$474,133	$462,977
Incremental Measure Costs	$1,815,186	$105,954
Total Non-Incentive Costs	$2,497,232	$771,952
Benefits		
Electric Benefits	$1,171,779	$124,230
Gas Benefits	$3,256,975	$371,070
Emissions Benefits	$835,170	$101,759
Total TRC Benefits	$5,263,923	$597,058
Net TRC Benefits	**$2,766,691**	**($174,893)**
TRC B/C Ratio	**2.11**	**0.77**

Evaluation Outcomes and Recommendations

In CY 2013, the Program was very successful, particularly when compared to previous years. The Program Implementer's decision to align the Enhanced Rewards Program with the Residential Rewards Program allowed for more widespread marketing and engagement with both customers and Trade Allies. Additionally, the Implementer's persistence in working with and engaging Trade Allies further drove participation. Program participation throughout the year was strong but increased steadily in the latter half of the year, particularly after the heating season began.

The Evaluation Team identified the following outcomes and recommendations to improve the Program.

Outcome 1. The Enhanced Rewards Program exceeded its goals in CY 2013.

Alignment with the Residential Rewards Program and strong enrollment in the second half of CY 2013 contributed to the Program's success.

Outcome 2. The Wisconsin Department of Administration partnership provided additional Program savings but accounted for a smaller portion of savings than anticipated by the Program Implementer.

Participation through the Department of Administration contributed 7.7% of overall savings, substantially less than the 30% the Program Implementer initially anticipated because the Program overall had greater participation than anticipated. The Program Implementer and the Program Administrator had added this partnership in an effort to increase savings over CY 2012. However, since the Program's CY 2013 participation through the standard process was higher than expected, the Department of Administration's contribution had less impact. The Program was able to achieve more savings from its target market of households that earn from 60% to 80% of SMI.

Recommendation 1. Consider continuing the partnership with Department of Administration in future years to achieve additional savings. Although the Department of Administration participation extended the Program to households earning less than 60% of the SMI, the partnership successfully installed high-efficiency equipment in limited-income households.

In determining program design for future years, the Evaluation Team recommends that the Program Administrator and Program Implementer consider the following:

- The Department of Administration-Enhanced Rewards Program partnership provides a valuable source of funding that helps the Department of Administration serve limited-income customers and install high-efficiency equipment in more Wisconsin households.

Outcome 3. Trade Allies were critical to the CY 2013 Program's successful outreach and performance.

More than half of CY 2013 participating customers found out about the Program through Trade Allies. Trade Allies drive customer participation by promoting awareness, distributing marketing materials, and educating customers about saving energy. Participating Trade Allies were satisfied with the Program-provided marketing resources during CY 2013. Not surprisingly, most nonparticipant Trade Allies did not use the available marketing resources.

Recommendation 2. Continue to engage Trade Allies and involve them in the Program. Consider identifying geographical areas that are high in both potential customers and Trade Allies but low in participation. Identify both participating and nonparticipating Trade Allies in these areas and ensure they have the resources they need to promote the Program.

Outcome 4. Customers encountered difficulty with the Program applications.

While most CY 2013 customers did not have problems with the application, some stated that the application process made participation difficult. One Trade Ally also said Program paperwork may be a barrier to participation for some customers.

Recommendation 3. Consider creating an online application option, while continuing to offer the current paper-based application process. An online application would allow customers and Trade Allies to access the application independently. The Evaluation Team understands that plans are underway to establish this option. Online applications would also considerably reduce data entry time, allowing Implementer staff to focus on quality control. The Evaluation Team recommends the following considerations in establishing an online application:

- Make essential entry fields mandatory (name, phone number, etc.) to allow for comprehensive data collection.
- Pre-populate fields as necessary to maintain consistency within the Program (and across all Focus on Energy programs). For example, Trade Allies should be able to select their name from a preapproved list in the online form to maintain consistent spelling and formatting across

multiple projects. This will allow Program staff to monitor performance across standardized categories.

Outcome 5. SPECTRUM does not track the EUL value for each measure type.

Recommendation 4. Specify the EUL for each measure type used to estimate the life-cycle savings and track it in the program's database. The Evaluation Team calculated the *ex ante* EUL values by dividing the life-cycle savings by the annual savings for each measure type as reported in the tracking database as this value was missing in 2013 tracking system database. However, the Evaluation Team understands that changes to the tracking database are underway to contain a variable field for the measure's EUL, and that during 2013 the Program Implementer did not have the ability to change the EUL fields within SPECTRUM.

Outcome 6. SPECTRUM does not include record of whether a participant's home is served by a central cooling system or not.

Recommendation 5. In the Program tracking database, specify if participant homes have a central air conditioning system to ensure that only those homes get credit for demand savings during the summer peak. The inclusion of house and AC unit characteristics can also be used to more accurately calculate demand reductions.

In CY 2013, demand savings were claimed for all participant homes that had ECM fans installed. The Evaluation Team recommends tracking the cooling system type, along with home and AC unit characteristics, in the Program database to ensure that homes without a central air conditioning system are not credited for demand savings associated with ECM fans and to allow a more accurate assessment of electricity energy savings. (This recommendation was also part of CY 2012 Enhanced Rewards Program's evaluation report.)

Express Energy Efficiency Program

The Express Energy Program offers energy-efficiency education, direct install measures, and instant energy savings to residential customers who may not be ready to engage in more substantial upgrades. The Program also serves to make customers aware of other opportunities through Focus on Energy programs. Conservation Services Group (CSG) is the Program Implementer. The Implementer markets the Program through the local utility in the targeted city. The Implementer's technicians visit customers and install the following measures at no cost:

- Compact fluorescent lamps (CFLs), up to 12 per residence
- Faucet aerators and energy efficient showerheads (no limit)
- Water heater pipe insulation (up to six feet)
- Setback on the water heater temperature gauge

Technicians also walk through the home to identify opportunities for deeper savings and inform residents about relevant incentives available from Focus on Energy.

Focus on Energy did not make any significant changes to the Program design for calendar year (CY) 2013.

Table 125 lists the Program's actual spending, savings, participation, and cost-effectiveness.

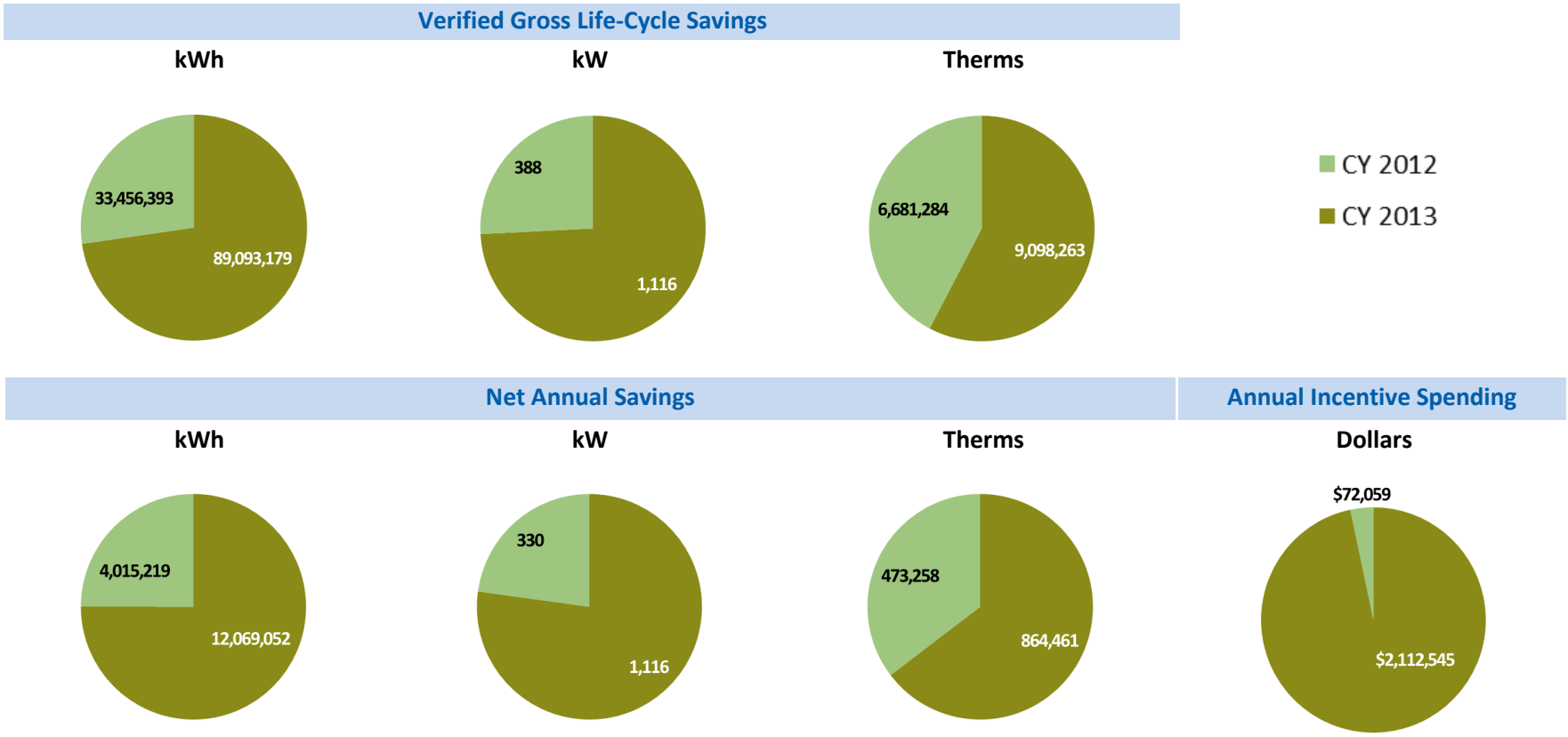
Table 125. Express Energy Efficiency Program Actuals Summary[1]

Item	Units	CY 2013 Actual Amount	CY 2012-2013[2] Actual Amount
Incentive Spending	$	$ 2,112,544	$ 2,184,604
Verified Gross Life-Cycle Savings	kWh	89,093,179	122,528,221
	kW	1,116	1,504
	Therms	9,098,263	16,084,271
Net Annual Savings	kWh	12,069,052	16,084,271
	kW	1,116	1,446
	Therms	864,461	1,337,719
Participation	Customers	24,872	34,727
Cost-effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	4.68	5.34 [3]

[1] This table presents gross life-cycle savings to allow comparison with Focus on Energy's quadrennial gross life-cycle savings target, and net annual savings to allow assessment of the Program Administrator and Program Implementer's achievement of net annual savings.
[2] The Program launched in 2012, so no values for 2011 are provided.
[3] The cost-effectiveness ratio is for CY 2012 only.

Figure 113 shows a summary of savings and spending progress made in CY 2012 and CY 2013. The Program met its targets in CY 2013 and is progressing well.

Figure 113. Express Energy Efficiency Program Two-Year Savings and Spending Progress (CY 2012-2013)



Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted impact and process evaluations for CY 2013. The following key questions directed the Evaluation Team's design of the EM&V approach:

- What are the gross and net electric and gas savings?
- How can the Program increase its energy and demand savings?
- How well is the Program working?
- Is the marketing strategy effective?
- Are the measures still installed?
- What are the usage habits for the measures?
- What is the level of customer satisfaction with the Program?

The Evaluation Team designed its EM&V approach to integrate multiple perspectives in assessing Program performance. Table 126 lists the specific data collection activities and sample sizes used to evaluate the Program.

Table 126. Express Energy Efficiency Program CY 2013 Data Collection Activities and Sample Sizes

Activity	CY 2013 Sample Size (n)	CY 2011-2013 Sample Size (n)
Impact		
Program Database Review	Census (24,872 participants)	Census (34,727 participants)
Verification Site Visits	72	72
Process		
Program Implementer Interviews	1	2
Program Administrator Interviews	1	2
Field Technician Interviews	N/A	7
Community Partner Interview	N/A	10
Customer Telephone Surveys	70	99
Nonparticipant (Drop-out) Surveys	N/A	14
Materials Review	N/A	N/A

Data Collection Activities

The Evaluation Team collected data from several different groups:

- **Site Visits of Participants' Homes.** For the impact evaluation, the Evaluation Team conducted 72 random site visits.
- **Program Administrator and Implementer Interviews.** For the process evaluation, the Evaluation Team conducted an interview with the Program Administrator and a separate interview with the Program Implementer. The Evaluation Team designed the questions to focus on changes since CY 2012, particularly for the areas of improvement identified in the CY 2012 evaluation.

- **Customer Telephone Surveys.** The Evaluation Team conducted surveys with a sample of participating customers to inform both the impact and process evaluation.

Impact Evaluation

To calculate gross savings, the Evaluation Team reviewed the Program tracking data. In addition, the Evaluation Team conducted site visits to physically verify the installed measures and estimate the ISR.

The ISR represents the percent of measures still installed, in use, and operating properly following the installation by the Implementer. The Evaluation Team multiplied the ISR by the total *ex ante* gross energy savings at a measure-level to obtain the Program's total *ex post* gross energy savings and the realization rate. As the measures were directly installed, net-to-gross ratio was assumed to be 1. Directly installed measures are assumed to be provided to customers that were unlikely to purchase the measures on their own in the near future.

Evaluation of Gross Savings

This section describes how the Evaluation Team assessed gross Program savings.

Tracking Database Review

The Evaluation Team conducted a thorough review of the Program tracking database to verify completeness and quality of the data populating the database. The Evaluation Team recorded and addressed any discrepancies or omissions in participant, measure counts, and deemed savings in relation to petitions.

The Evaluation Team found no duplication of savings associated with measures installed under the Program, nor any duplicate participants. The Evaluation Team found three instances where a measure was recorded without savings. Since the reasons behind the omissions was unclear, the Evaluation Team did not assign any savings to these instances in either the *ex ante* or *ex post* savings.

The Evaluation Team noticed there were multiple per-unit deemed savings values assigned to all Non PI[41] measures in the tracking database, as well as various EULs per measure type, throughout CY 2013. The Evaluation Team understands that these changes were a result of requested updates and therefore passed through their deemed savings and EULs when calculating *ex ante* and *ex post* gross savings. A requested update is used to adjust the deemed savings value in advance of the TRM taking effect. For instance the EUL for CFLs increased from six years to eight years, while the EULs for showerheads and aerators decreased.

[41] Measures that were not installed by the Program Implementer (PI) are referred to as "Non PI" measures.

The Evaluation Team found that 32% of the Non PI "CFLs – 19 Watt" measure units reported a demand savings value of 0.0005 kW. However, the deemed demand savings associated with the rest of the measure units was 0.0037 kW. Table 127 shows the different savings found for these Non PI "CFLs – 19 Watt" measures. Given that the low demand savings value was associated with the highest energy savings value, the Evaluation Team thought the demand savings should be at least equal to its lower electric savings counterparts and that this could have been resulted from a data entry error. The Evaluation Team referenced the Focus on Energy work paper for 19W CFLs measure type in the Program. The work paper indicated that the deemed savings value should be 0.005 kW. The Evaluation Team applied this corrected value to the *ex post* savings.

Table 127. SPECTRUM "CFLs – 19 Watt" Savings

kWh Savings	kW Savings
21.32	0.0037
34.38	0.0037
46.52	0.0005 (corrected to 0.005)

Gross and Verified Gross Savings Analysis

In addition to reviewing the Program database, the Evaluation Team used the deemed assumptions and algorithms to verify the measure-level savings and incorporated the ISR determined through onsite data collected for each measure type.

In-Service Rate Analysis

In its calculation of *ex post* savings, the Evaluation Team calculated and applied an ISR derived from physical verification of installed measures.

The Evaluation Team conducted a total of 72 verification site visits, during which it confirmed whether the reported energy-efficiency measures were installed, in use, and operating properly. The Evaluation Team verified the installation of the following Program measures:

- Lighting – CFLs
- Faucet aerators – (kitchen and bathroom)
- Showerheads
- Water heater pipe insulation
- Water heater temperature turn down

During the site visits, the Evaluation Team visually confirmed and measured flow rates (for aerators and showerheads) of the claimed measures obtained from the tracking database. It recorded any discrepancies in order to identify common issues found throughout the Program sample.

As shown in Table 128, the Program's ISRs ranged from 53% for Domestic Hot Water (DHW) Temperature Turn Down measures to 97% for all CFL measures.

Table 128. Express Energy Efficiency Program In-Service Rates

Measure	n	Reported Installations	Verified Installations	Percent Installed	Relative Precision @ 90% Confidence
Lighting–CFLs	67	699	680	97%	3%
Aerator–Kitchen	40	41	31	76%	16%
Aerator–Bathroom	63	101	87	86%	8%
Showerheads	52	69	60	87%	13%
Water Heater Pipe Insulation	46	46	44	96%	5%
Water Heater Temp. Turn Down	18	17	9	53%	39%

Sampling the Verification Site Visits

The Evaluation Team visited 72 random sites in order to establish the ISR. Due to budget constraints, the Evaluation Team chose to sample participants' homes from regions with a large concentration of customers. These were Milwaukee, Madison, Beloit and Janesville, Fond du Lac, Green Bay, Appleton, and the suburbs between Milwaukee and Madison. The Evaluation Team based the allocation on the minimum distance to a region's central ZIP Code and selected the sampled sites randomly, proportional to the number of participants within each region.

The Evaluation Team chose the central ZIP Codes as points of focus of population centers. If a ZIP Code in the dataset was not within 25 miles of any of the regions, the Evaluation Team placed it in the "other" region category, and did not include it in the sample for site visits. This excluded 5.65% of the participants from the sample.

Figure 114. Map of Site Visit Sampling Population

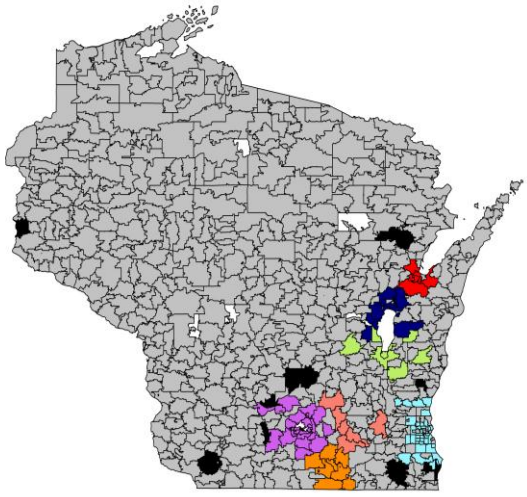


Table 129 presents the distribution of participants. The column labeled "Color" refers to the population regions on the map shown above.

Table 129. Express Energy Efficiency Program Site Visit Sampling Regions

Region	Region Name	Color	Central ZIP Code	Percent (Participation Count)
1	Milwaukee and suburbs	Light Blue	53226	18.72%
2	Fond du Lac	Green	54935	15.23%
3	Green Bay	Red	54304	8.89%
4	Beloit and Janesville	Orange	53511	19.07%
5	Madison and suburbs	Purple	53714	18.63%
6	Appleton	Blue	54952	8.72%
7	Between Milwaukee and Madison	Salmon	53094	5.11%
0	Other	Black		5.65%

Site Visit Verification Findings

Compact Fluorescent Lamps (CFLs)

The Evaluation Team visually verified that 680 of the 699 reported CFL measures were installed and functioning, yielding a 97% installation rate for this direct install measure.

The Evaluation Team interviewed participants to determine the reasons for any discrepancies in the number of CFLs that were recorded as installed and those observed, as shown in Table 130.

Table 130. Express Energy Efficiency Program Discrepancies in Installed CFLs

Reasons for Discrepancy	Number of Instances
Customer could not locate missing bulb(s)	1
Extra bulb(s) stored due to maximum fixture capacity	7
Bulb was not installed	1
Bulb removed/stored due to lack of brightness	1
CFL bulb burnt out	1
Bulb removed due to excess brightness	8

Faucet Aerators

The Evaluation Team verified that 31 of the 41 reported kitchen faucet aerator measures and 87 of the 101 reported bathroom faucet aerator measures had been installed. This yielded ISRs of 76% and 86%, respectively.

The Evaluation Team conducted a flow-rate test by holding a flow meter test bag around each aerator and turning the water fully on for five seconds. Gradations marked on the bag measured the aerator's

operating gallons per minute (gpm). The Evaluation Team conducted this test three times, recorded the gpm, and determined an average flow rate for each aerator. The measured flow rate was compared against the rated flow rate of the installed aerator.

The Evaluation Team interviewed participants to determine the reasons for discrepancies between the reported number of kitchen and bathroom faucet aerators installations and those observed; the results of these interviews are shown in Table 131 and Table 132, respectively.

Table 131. Express Energy Efficiency Program Faucet Aerator – Kitchen Discrepancies

Reasons for Discrepancy	Number of Instances
Removed due to low flow rate / lack of pressure	3
2.0 gpm rated aerator installed versus 1.5 gpm claimed	1
Faucet replaced, aerator(s) not installed on new equipment	1
Aerator incompatible with appliance attachments	1
Removed due to leaking	1

Table 132. Express Energy Efficiency Program Faucet Aerator – Bathroom Discrepancies

Reasons for Discrepancy	Number of Instances
Faucet replaced, aerator(s) not installed on new equipment	2
Unable to verify/access equipment on site	1
Removed due to increase water pressure	3
Removed due to low flow rate	1
Contractor claimed higher measure units than installed	1
Faucet flow rate is different than claimed	1

Showerheads

The Evaluation Team verified that 60 of the 69 reported showerhead measures had been installed, yielding an 87% installation rate. An analogous process to the aerators was followed for measuring flow rates of showerheads.

The Evaluation Team interviewed participants to determine the reasons for discrepancies between the reported number of showerheads installed and those observed; these results are shown in Table 133.

Table 133. Express Energy Efficiency Program Low-Flow Showerhead Discrepancies

Reasons for Discrepancy	Number of Instances
Removed due to low flow rate / lack of pressure	6
Removed due to look/style of showerhead	2
Contractor left equipment, customer chose not to install	1

Water Heater Pipe Insulation

The Evaluation Team visually verified that 44 of the 46 reported pipe insulation measures were still installed at the time of the site visit, yielding a 96% ISR. The Evaluation Team also noted pipe insulation length and calculated an average length of 5.17 feet per household.

At two sites, customers replaced the water heater after the measure was installed, but neither of the new water heaters had pipe insulation installed.

Water Heater Temperature Turn Down

The Evaluation Team verified, both visually and verbally with the customer, that the temperature set point had been lowered on water heaters in nine out of 17 reported installations, yielding a 53% ISR. The Evaluation Team interviewed participants to determine the reasons for the discrepancies; the results of these interviews are shown in Table 134.

Four customers were either unaware of any change made by a contractor and/or the Evaluation Team was unable to visually check the water heater. These sites were removed from the overall sample.

In three instances, the customer replaced the water heater on which the Program contractor had turned down the set points; the customer did not turn down the temperature on the new equipment. Two customers altered their set point on a seasonal basis, and one customer did not like the change and reset the water temperature to its original set point. One customer reported that the Program Implementer did not change the set point. One customer stated that the contractor turned the temperature dial up rather than down, incorrectly increasing the set point temperature.

Table 134. Water Heater Temperature Turn Down Discrepancies

Reasons for Discrepancy	Number of Instances
Replaced water heater since Program equipment installation	3
Set point increased seasonally	2
Set point increased due to contractor turning dial wrong way	1
Customer was told no change needed, measure was still claimed by contractor	1
Set point increased due to water not being hot enough	1

Realization Rates

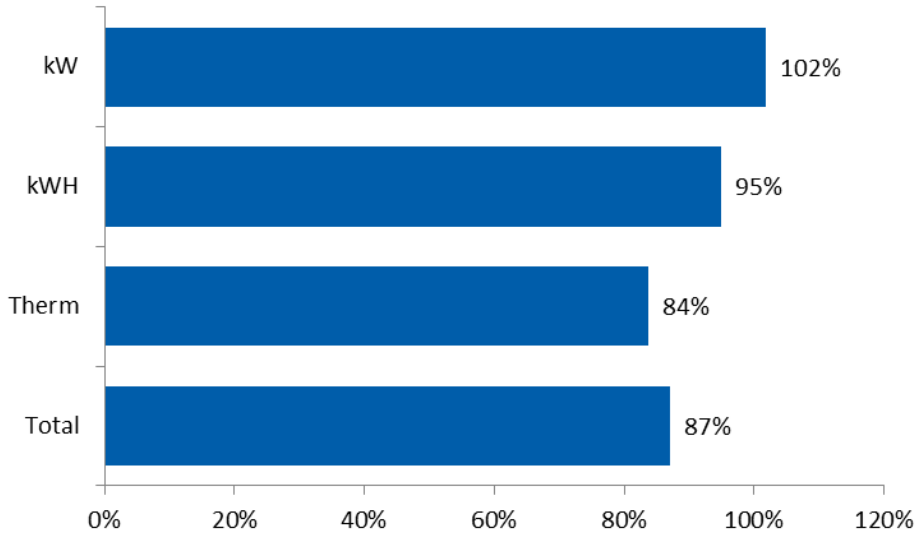
The Evaluation Team used the ISRs, as determined above, to develop an overall realization rate of 87.0% for the Program measures (Table 135). The overall realization rate is weighted by the total savings, in MMBtu, for each program.

Table 135. Express Energy Efficiency Program Realization Rate by Measure

Measure Type	Realization Rate
Lighting–CFLs	97.3%
Faucet Aerator–Kitchen	75.6%
Faucet Aerator–Bathroom	86.1%
Showerheads	87.0%
Water Heater Pipe Insulation	95.7%
Water Heater Temperature Turndown	52.9%
Total	**87.0%**

Figure 115 shows the realization rate by fuel type.

Figure 115. Express Energy Efficiency Program Realization Rate by Fuel Type



Gross and Verified Gross Savings Results

Table 136 presents the total and verified gross savings, by measure type, achieved by the Program in CY 2013. The Evaluation Team applied the realization rates to the gross *ex ante* savings to calculate the verified gross *ex post* savings.

Table 136. Express Energy Efficiency Program Gross Savings Summary

Measure Type	Gross			Verified Gross		
	kWh	kW	Therms	kWh	kW	Therms
Lighting-CFLs	10,211,883	1,096	0	9,934,306	1,116	0
Aerator–Kitchen	413,676	0	141,891	312,779	0	107,284
Aerator–Bathroom	377,564	0	166,112	325,229	0	143,087
Showerheads	1,251,617	0	550,666	1,088,363	0	478,840
Water Heater Pipe Insulation	395,155	0	100,650	377,975	0	96,274
Water Heater Temperature Turn Down	57,424	0	73,624	30,401	0	38,977
Total Annual	**12,707,319**	**1,096**	**1,032,943**	**12,069,052**	**1,116**	**864,461**
Lighting-CFLs	68,674,076	1,096	0	66,807,399	1,116	0
Aerator–Kitchen	2,970,291	0	1,081,195	2,245,830	0	817,484
Aerator–Bathroom	2,690,621	0	1,275,158	2,317,663	0	1,098,403
Showerheads	14,911,332	0	6,577,122	12,966,376	0	5,719,237
Water Heater Pipe Insulation	4,754,404		1,219,058	4,547,691	0	1,166,055
Water Heater Temperature Turn Down	393,305	0	561,159	208,220	0	297,084
Total Life-Cycle	**94,394,030**	**1,096**	**10,713,691**	**89,093,179**	**1,116**	**9,098,263**

Evaluation of Net Savings

The Evaluation Team assigned a net-to-gross ratio of 1 to all measures since the Program offers only direct install measures.

Net Savings Results

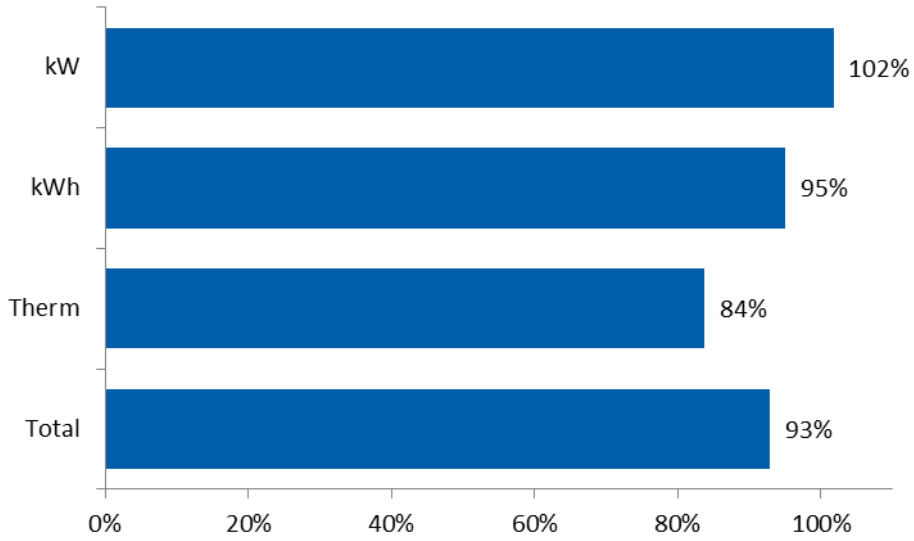
Table 137 shows the net energy impacts (kWh, kW, and therms) for the Program. The Evaluation Team attributed these savings net of what would have occurred without the Program.

Table 137. Express Energy Efficiency Program Net Savings

		Verified Net		
		kWh	KW	Therms
Total Savings	**Annual**	**12,069,052**	**1,116**	**864,461**
	Life-Cycle	**89,093,179**	**1,116**	**9,098,263**

Figure 116 shows the net savings as a percentage of the *ex ante* gross savings by fuel type.

Figure 116. Express Energy Efficiency Program Net Savings as a Percentage of *Ex Ante* Savings by Fuel Type



Process Evaluation

For the process evaluation, the Evaluation Team interviewed the Program Implementer and Administrator and conducted 70 surveys with CY 2013 participants.

For the Program Administrator, Program Implementer, and customers, the Evaluation Team focused on Program changes since CY 2012, and followed up on issues identified in the CY 2012 evaluation. Key recommendations from CY 2012 included:

- Resolving the data-entry issue that prevented bulk upload of project records to SPECTRUM
- Exploring flexible scheduling options to allow more customers to participate in each city
- Improving communication with utilities overall as well as the approach to request marketing assistance for the Program
- Reassessing the brand and style of the faucet aerator to improve customer satisfaction and decrease instances of aerator removal
- Ensuring technicians know to install all of the energy-saving measures and that they do not leave anything behind uninstalled.

Program Design, History, and Goals

Launched in April 2012, the Program provides instant savings to residential customers through a walkthrough assessment and installation of low-cost energy-efficiency measures in their homes. In CY 2013, the Program Implementer used trained technicians to conduct the assessments and install the measures—CFLs, faucet aerators, showerheads, water pipe insulation, and a setback on the water heater temperature—the same measures offered in CY 2012.

The Implementer offered the Program city by city so its staff could consolidate the site visits geographically. Since the Implementer has multiple field teams, it can carry out Program activities in several cities at the same time. Eligible households may participate once per Program cycle (CY 2012-2014); therefore, the Implementer targeted areas in CY 2013 that it did not visit in CY 2012.

The Implementer worked with the local utility to promote the Program in a targeted city before and during the implementation period. Most utilities used direct mailings and did not incorporate market segmentation. While moderate- and low-income households participated, the Program was not designed to target them exclusively. The Implementer worked with local community service organizations (CSOs) to make sure that these hard-to-reach populations were aware of Program offerings.

Program Goals

The CY 2013 Program performed better than expected. The Administrator and the Implementer reported that the Program performed well enough to renegotiate the contract and increase the budget and savings goals midyear CY 2013. The Program exceeded its participation target and served nearly twice as many residential customers as in CY 2012.

According to the Administrator and the Implementer, the CY 2013 Program ran more efficiently than in CY 2012; the ramp-up time in each community was shorter during the second year of implementation. Both said there were very few problems with implementation and that CY 2013 was "smooth and steady." The Program Implementer received several letters during CY 2013 from satisfied customers.

In CY 2012, Administrator reported the Program had achieved more natural gas and less electric savings than anticipated. Both Administrator and the Implementer said that CY 2013 was closer to what they expected based on statewide averages for gas- and electric-fueled appliances. The Implementer reported the following factors contributed to the higher proportion of electric savings in CY 2013:

- Distribution rates (customer acceptance rates) for CFLs were higher than forecasted, while rates for water-heating measures were lower.
- The Program reached more homes in a wider geographic region than it did in CY 2012, resulting in a Program population more consistent with the statewide average (expected norm).
- Through an approved request to adjust the deemed savings value in advance of the TRM taking effect, the EUL for CFLs increased from six years to eight years, while the EULs for showerheads and aerators decreased. This resulted in increased CFL life-cycle savings and decreased water-heating measure life-cycle savings. The Program targets were adjusted to take this change into account.

In addition to energy savings, the Implementer monitored certain KPIs. For CY 2013, the Program Implementer tracked these KPIs:

- **Distribution**: the number of each measure installed per home and in total
- **Collaboration:** the number of partnerships with CSOs (non-utility partners; e.g., aging and disability service groups or churches) that helped with outreach and marketing to their members
- **Participation**: the number of participating moderate- to low-income households

The Program Administrator reported that services to moderate- to low-income households were meeting the KPI target, despite the fact that collaboration with CSOs did not recruit as many customers as expected.

Program Management and Delivery

Program design, structure, processes, materials, and marketing strategy did not change significantly in CY 2013. The Evaluation Team assessed the following Program management and delivery aspects:

- Management and delivery structure
- Data management and reporting
- Marketing and outreach
- Customer experience

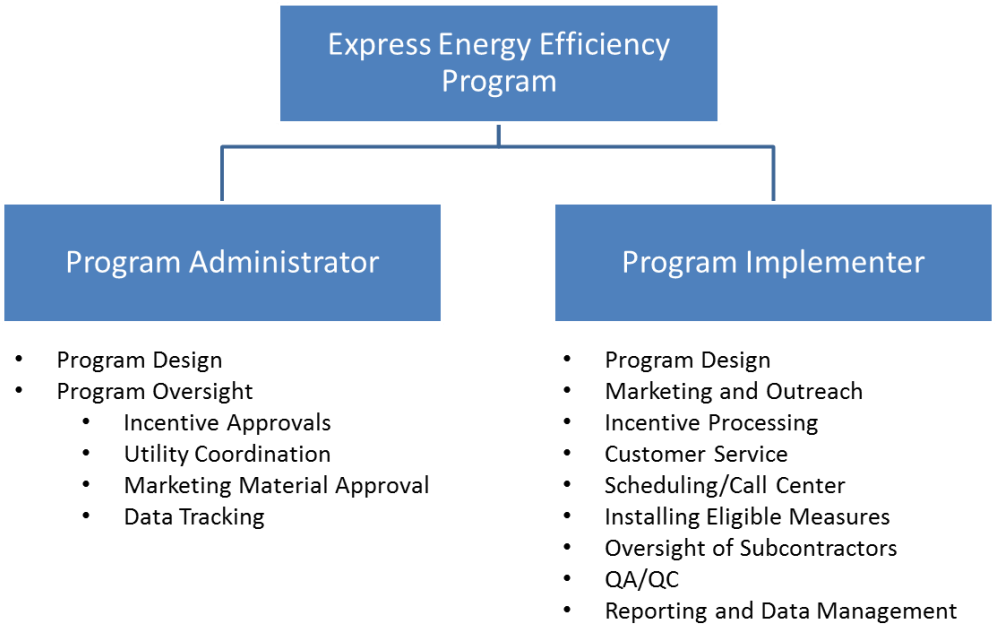
Management and Delivery Structure

Staff roles and responsibilities for the Program Administrator and Implementer did not change significantly in CY 2013. Implementer staff reported that, overall, they have settled into their respective roles and that implementation processes were faster and more efficient than during CY 2012. Administrator staff also said staffing was adequate for the workload, and they monitored the direct-mail volume and timing so it did not generate more demand than they could meet in a specific timeframe. Implementer staff said that communication with the Program Administrator was good and they communicated daily about Program activities.

The Implementer conducted the majority of the Program home visits. However, it used subcontractors to conduct home visits in outlying geographic areas. Subcontractors primarily worked in St. Croix County in CY 2013. The same subcontractors worked with the Program in CY 2012 and CY 2013, and they used the same forms as the Implementer's technicians. The Program Implementer's lead technician periodically traveled to the subcontractors' service areas and performed a quality-assurance review of their work. The Administrator and the Implementer said the subcontractors were well-established in the Program, and they performed well. The Administrator also reported it could discern no difference between services provided by the Program Implementer and subcontractor.

Figure 117 shows a diagram of the key actors for the Express Energy Efficiency Program.

Figure 117. Express Energy Efficiency Program Key Program Actors and Roles



Key Program Processes

In CY 2012, some customers reported they had trouble scheduling a home appointment; to address these issues in CY 2013, the Program Implementer added some flexibility to the scheduling system. First, the Implementer estimated the potential number of audit appointments for each targeted community and then created a timeframe for scheduling audits in that community. Implementer staff assessed the customer response in each community, and in instances of high demand, they added a Saturday scheduling option or extended the scheduling period. Customers could also schedule early evening audit appointments since Implementer staff worked until 6:00 p.m. In communities with additional scheduling demands, the Implementer staff maintained a wait list and circled back to that community, as Program resources allowed, to serve residents on the wait list.

These efforts to improve scheduling resulted in fewer customer complaints, according to the Program Implementer, although some customers still could not get the appointment they preferred. While the Implementer said online scheduling capability might be helpful, this functionality was not available in CY 2013.

Program Data Management and Reporting

In CY 2012, one of the most critical barriers to cost-effective performance was the need to employ temporary workers to manually upload each project to the SPECTRUM database. The Implementer said it had hoped to have the option to bulk upload data to SPECTRUM, but this function did not become

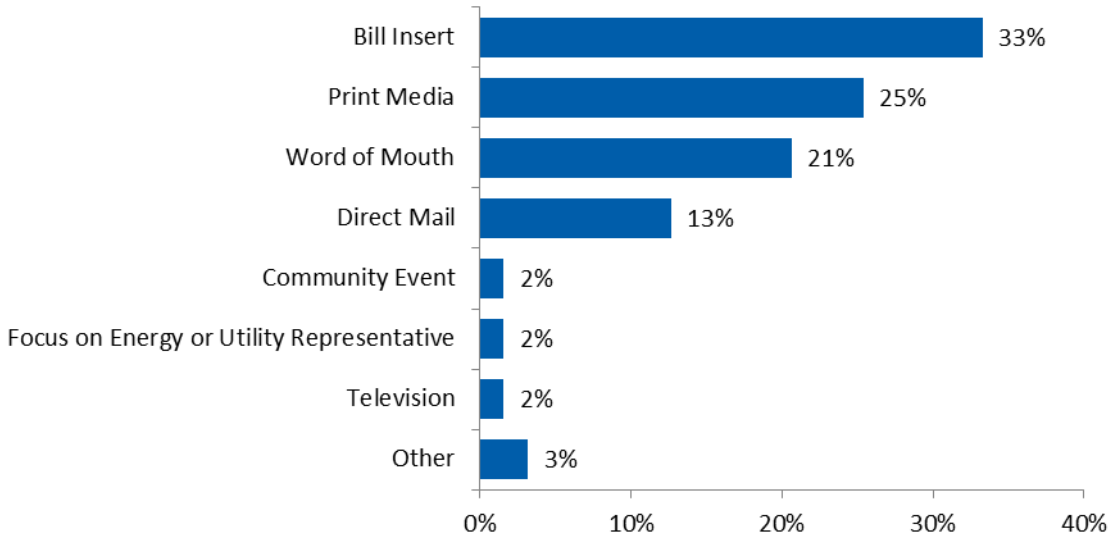
available during CY 2013. The Program Administrator said that the bulk upload function to SPECTRUM is not currently scheduled or planned. The Administrator confirmed that the PSC is aware of the need to have bulk upload capability.

Marketing and Outreach

The primary method of outreach to customers is a mailing from a cooperating local partner. In CY 2012, the Implementer found that the utility was by far the most effective community partner to work with, but that not all the utilities it approached were willing or able to collaborate. In CY 2013, the Implementer streamlined its approach to utilities by presenting several ready-made options for messaging. Using the new approach, Implementer staff reported that utilities have assisted with outreach and marketing in 90% to 95% of the communities served by the Program. As in CY 2012, the Implementer found that utility-supported marketing was more effective than other recruitment methods.

In the evaluation surveys, the Evaluation Team asked participating customers where they most recently heard about the Program. The most commonly mentioned sources were the bill insert, print media, and word-of-mouth. Figure 118 lists the most commonly cited sources for Program information.

Figure 118. Customer Sources for Program Information



Source: Express Energy Efficiency Participant Survey B1: "Where did you most recently hear about the Focus on Energy Express Energy Efficiency Program?" (n = 70)

According to Implementer staff, across the 51 communities targeted by the outreach and marketing activities in CY 2013, the average participation rate for each community was 8% of residential households. For communities that received a second mailing, the participation rate was more than 12%, and as high as 15% in one community. (Participation in CY 2012 ranged from 4% to 15%, but the average

value across all communities was not available.) The Implementer did not formally track mailer effectiveness during CY 2013. The evaluation team did not have per-community population numbers with which to verify the Implementer's assumptions.

Administrator and Implementer staff believe the Program is marketed effectively, so no significant changes to outreach and marketing were needed during CY 2013. The Evaluation Team did not have sufficient data to review participation rates by community or to conduct comparisons across various outreach methods.

In 5% to 10% of communities served, the Program utilized non-utility partners for outreach and marketing activities. For these communities, the Implementer obtained a tax assessor's list or worked with a local sustainability committee to develop contact lists and mailed out letters. However, these mailings were not as successful as those sponsored by a local utility—the percentage of eligible households that responded was lower than in other communities. In several communities, the Implementer collaborated with CSOs to market the Program, in addition to other direct mailing efforts. The Implementer did not notice any increase in participation based on these efforts and noted that anyone contacted would also be reached through the direct mail campaign. No quantitative data were available to the Evaluation Team to assess these statements.

Cross-Promotion of Other Focus on Energy Programs

The Program Administrator ranked the cross-promotion of other Focus on Energy programs through the Program as a medium priority and viewed such promotion as secondary to individual program marketing assessments. The Implementer ranked the cross-promotion of other Focus on Energy programs as a high priority.

The Program design allowed the Implementer's technicians to point out potential energy-savings opportunities to customers based on observed energy uses in their homes. The Implementer said the technicians typically left behind other Focus on Energy program materials. However, in some cases, the technicians did not have materials from all available programs and did not have enough marketing materials to leave with each customer. The Administrator reported instances of the Program customers participating in the Home Performance with ENERGY STAR® Program, and vice versa, but they did not gather quantitative data on the effectiveness of cross-promotion of other Focus on Energy through the Express Energy Efficiency Program.

During the customer survey, the Evaluation Team asked participants about their awareness of and participation in other Focus on Energy programs. Twenty percent of the respondents reported that they were aware of other Focus on Energy programs, and about half of these respondents reported participating in the following Focus on Energy programs:

- Home Performance with ENERGY STAR Program
- New Homes Program

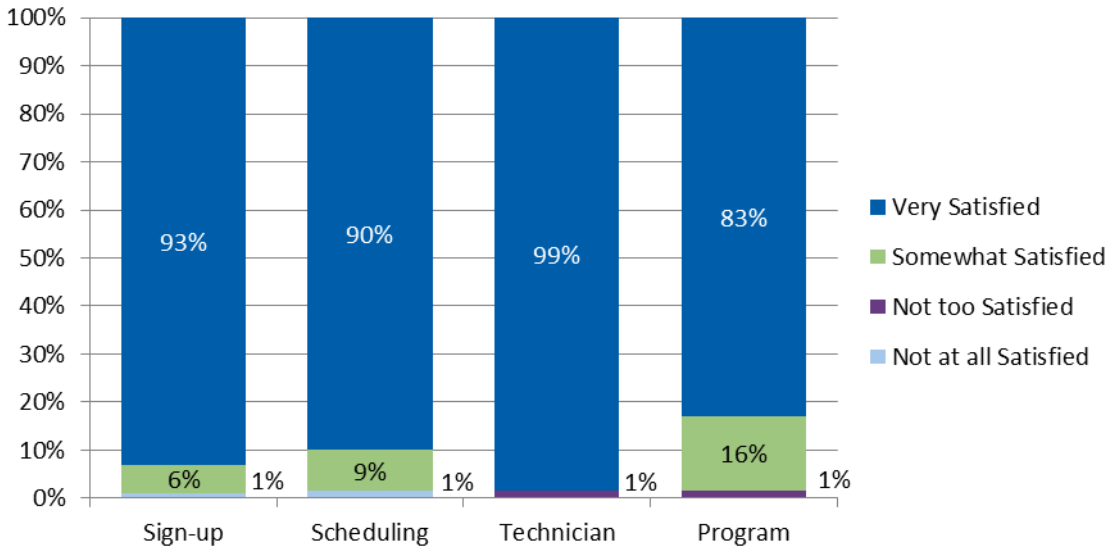
- Appliance Recycling Program
- Residential Rewards Program

Customer Experience

Satisfaction

Customer satisfaction with specific Program components and with the Program overall was high, as shown in Figure 119. In addition to rating their satisfaction, customers rated the likelihood they would recommend the Program to others, using a scale of 0 (extremely unlikely) to 10 (extremely likely). Most customers (94%) were "very likely" to "extremely likely" to make a recommendation to others.

Figure 119. Customer Satisfaction with Aspects of Express Energy Efficiency Program Delivery and Service



Source: Express Energy Efficiency Participant Survey O1: "How satisfied were you with [program aspect]?" (n=70)

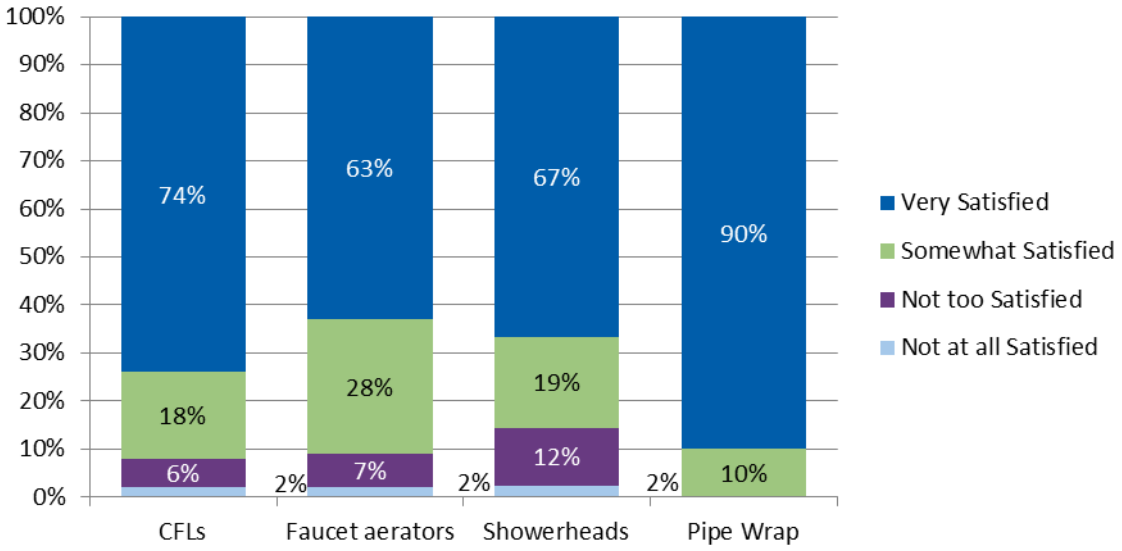
Some customers reported they were not satisfied with the Program due to scheduling issues and the quality of the installed products. For example, one customer said that the installed CFLs burned out within a month. Administrator staff reported that while they received overall positive comments, they also received two to three complaints per month, relating to missed appointments and other issues.

As in CY 2012, customer satisfaction with different aspects of the Program process was higher than satisfaction with the Program overall. The lower satisfaction ratings for the Program overall may be related to the customer's satisfaction with individual measures (See Figure 120).

In CY 2012, customer satisfaction with faucet aerators was the lowest of all the measures, with 52% of customers reporting they were "very satisfied" and 39% "somewhat satisfied." In contrast, in CY 2013, 63% of customers reported that they were "very satisfied" and 28% were "somewhat satisfied" with the

faucet aerators. This increase was not statistically significant, which may be due to the low CY 2012 sample size (n=29). A large sample in CY 2014 (n=50 or higher) would be a better group against which to compare customer satisfaction. Considering both the "very satisfied" and "somewhat satisfied" categories, showerheads were the least popular measure in CY 2013, with 86% satisfied.

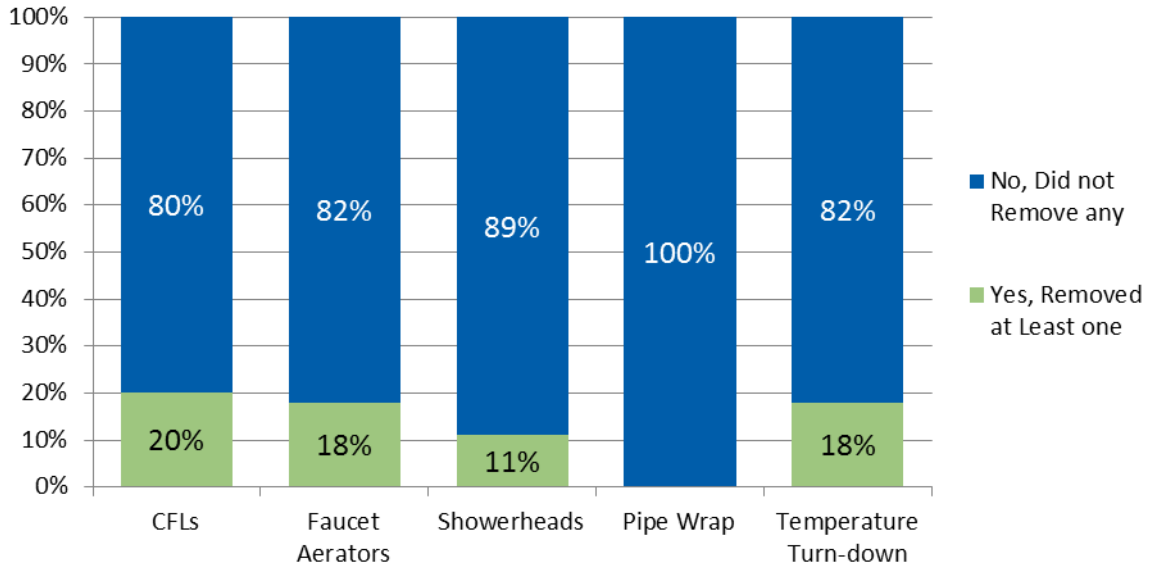
Figure 120. Express Energy Efficiency Program Customer Satisfaction by Type of Measure



Source: Express Energy Efficiency Participant Survey C11, F9, SH9,
P8: "How satisfied were you with [type of measure]?" (n≥40)

A minority of respondents reported removing some of the Program measures. Figure 121 shows the percentage of surveyed customers who reported removing at least one installed item, by measure type. None of the surveyed customers removed pipe wrap. (The Evaluation Team based its ISR calculations on the level of removal for each measure, as confirmed by Evaluation Team technicians during site visits.)

Figure 121. Express Energy Efficiency Program Customers Confirming Removal of at Least One Item



Source: Express Energy Efficiency Participant Survey C6, F6, SH6, P5: "Have you since removed any of the [type of measure] from the original fixture where they were installed?" (n≥22)

In CY 2012, the measure customers reported removing the most was the faucet aerator (35%). The removal rate for faucet aerators decreased in CY 2013, from 35% to 18%. While the difference is not statistically significant, the Implementer did change the model of faucet aerator provided, in response to CY 2012 customer complaints.

In CY 2013, customers most frequently reported removing CFLs, with 20% of customers reporting they removed at least one CFL. This removal rate is similar to the CY 2012 CFL removal rate (See Table 138).

The Evaluation Team asked customers why they removed installed measures. Table 139 lists the customers' reasons for removing the installed measures. Details on the "other" responses are provided below.

Table 138. CY 2012 and CY 2013 Express Energy Efficiency Program Measure Removal Rates

Materials	CY 2012[1]	CY 2013[2]
CFLs	20%	20%
Faucet Aerators	35%	18%
Showerheads	11%	11%
Pipe Insulation	0%	0%
Temperature Turn-down	25%	18%

[1] CY 2012 Participant Survey (CFLs n=25, faucet aerators n=23, showerheads n=19, pipe insulation n=19, temperature turn-down n-4)

[2] CY 2013 Participant Survey (CFLs n=66, faucet aerators n=60, showerheads n=44, pipe insulation n=44, temperature turn-down n=22)

Table 139. Customers' Reasons for Removal of Measures[1]

Reasons for Removal	Number of Mentions
CFLs	
Burned out or stopped working	10
Too bright	1
Interference with electronic devices	1
Other	3
Faucet Aerators	
Did not like the water flow	6
Faucet aerator did not fit properly	3
Other	3
Showerheads	
Did not like the water flow	4
Did not like how the showerhead looked	1
Other	1

[1] CY 2013 Participant Survey. Customers (n≥5) provided multiple responses for each question.

Some customers specified "other" reasons for removing measures:

- Three customers reported removing their installed CFLs for these reasons: they moved and took them to their new home; the socket was defective; and one customer reported relocating a CFL to a socket where an incandescent bulb had burned out (this case is not considered a removal).
- Two customers reported removing installed faucet aerators because "they sprayed water everywhere," and two customers removed the aerators because they did not fit property. One customer reported installing a new faucet.
- One customer reported removing the showerhead to install a larger showerhead.

The Evaluation Team asked responding participants whether the technician had installed the materials or whether they were left behind for the resident to install. Overall, technicians left fewer materials for customers to install in CY 2013 than in CY 2012. In CY 2012, only 78% of customers confirmed the technicians directly installed the CFLs.

In CY 2013, 95% of customers (n=66) confirmed that the technician directly installed the CFLs. The increase is statistically significant at the 90% confidence level. For faucet aerators (n=61), showerheads (n=44), and pipe wrap (n=43), 98% of respondents said the technicians installed each of these measures directly in CY 2013, a rate similar to the previous year.

Table 140 lists the percentage of customers who confirmed technician direct installation for each measure during CY 2012 and CY 2013.

Table 140. Percentage of Customers Confirming Materials Directly Installed by Technicians

Materials	CY 2012[1]	CY 2013[2]
CFLs	78%	95%
Faucet Aerators	100%	98%
Showerheads	95%	98%
Pipe Insulation	95%	98%

[1] CY 2012 Participant Survey (CFLs n=27, faucet aerators n=25, showerheads n=21, pipe insulation n=19)

[2] CY 2013 Participant Survey (CFLs n=66, faucet aerators n=61, showerheads n=44, pipe insulation n=43)

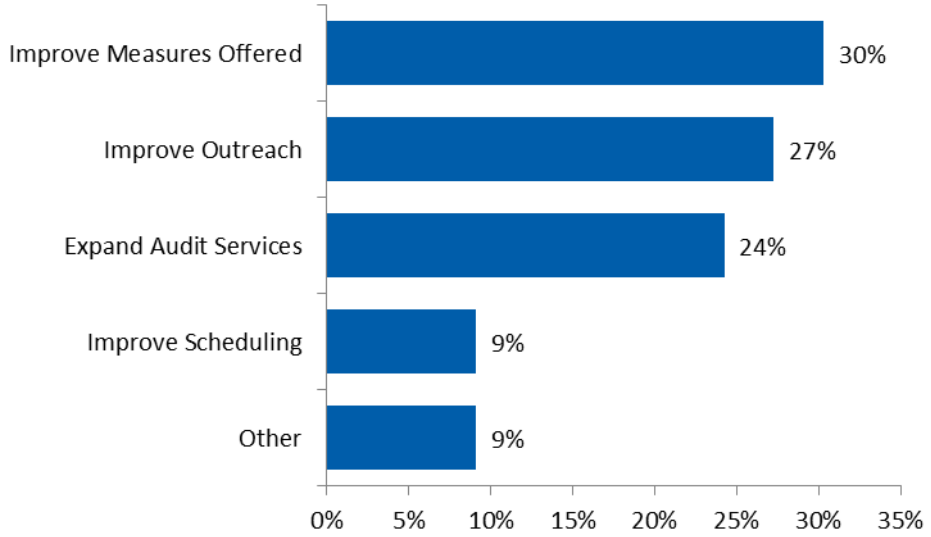
Customer Demographics

In general, CY 2013 demographic results were similar to CY 2012. Surveys found that 56% of participants (n=70) lived in homes built before 1970. The majority of customers had incomes in the $20,000 to $75,000 range, with 38% of customers having an income between $20,000 and $50,000 and 31% of customers having an income between $50,000 and $75,000. The majority of customers (61%) have a high school diploma or some college education, while 28% of customers surveyed have a college degree. Of the customers who reported having a degree, 10% have professional or graduate degrees.

Barriers to Participation and Recommended Changes

When surveyed, responding customers said they wanted to see improvements in the design and quality of products (measures) offered through the Program (30%), better Program marketing (27%), and expanded audit services (24%). Respondents who said the Program should expand the types of lighting measures offered to customers suggested outdoor and LED lighting. Respondents also suggested the Program expand its audit services to check furnace and air conditioner filters, add insulation, and test air flow in the home. Figure 122 lists respondents' Program improvement suggestions.

Figure 122. Customer Suggestions for Improving the Express Energy Efficiency Program



Source: Express Energy Efficiency Participant Survey O10: "Is there anything you would suggest to improve Focus on Energy's Express Energy Efficiency Program?" (n=70)

Program Cost-Effectiveness

Evaluators commonly use cost-effectiveness tests to compare the benefits and costs of a demand-side management program. The benefit/cost (B/C) test used in Wisconsin is a modified version of the total resource cost (TRC) test. Appendix I includes a description of the TRC test. Table 141 lists the CY 2012-2013 incentive costs for the Express Energy Efficiency Program.

Table 141. Express Energy Efficiency Program Incentive Costs

	CY 2013	CY 2012-2013
Incentive Costs	$ 2,112,544	$ 2,184,604

The Evaluation Team found the CY 2013 Program to be cost-effective (a TRC benefit/cost ratio above 1). Table 142 lists the evaluated costs and benefits.

Table 142. Express Energy Efficiency Program Costs and Benefits

Cost and Benefit Category	CY 2013	CY 2012
Costs		
Administration Costs	$383,826	$298,910
Delivery Costs	$875,295	$681,648
Incremental Measure Costs	$1,714,993	$524,403
Total Non-Incentive Costs	$2,974,114	$1,504,961
Benefits		
Electric Benefits	$4,308,900	$1,420,809
Gas Benefits	$6,588,214	$5,079,986
Emissions Benefits	$3,020,424	$1,528,259
Total TRC Benefits	$13,915,020	$8,029,054
Net TRC Benefits	**$10,940,905**	**$6,524,093**
TRC B/C Ratio	**4.68**	**5.34**

Evaluation Outcomes and Recommendations

Overall, the Program worked well and customers were highly satisfied. It exceeded its participation and electricity savings goals and nearly met its natural gas savings goals, and the Program Administrator and Program Implementer improved upon several of the process issues identified in the CY 2012 evaluation.

Outcome 1. Implementation of the Express Energy Efficiency Program was successful. The Program Implementer served 111% of its participation target, and showed notable improvements over the CY 2012 implementation process.

The Program nearly met the new increased savings goals while serving twice as many customers in CY 2013 as in CY 2012. Program highlights for CY 2013 include these:

- Administrator and Implementer staff reported that the Program performed well enough to renegotiate the contract and increase the CY 2013 budget and goals.
- The Program reached more homes in a wider geographic region in CY 2013 than in CY 2012.
- Relative to CY 2012, the Program ran more efficiently and needed less ramp-up time in each community.
- In CY 2013, utility-supported marketing continued to be the most effective recruitment method; the Program Implementer recruited 90% to 95% of the communities served from utility-supported marketing activities.

Outcome 2. While customers were generally satisfied with the scheduling process, an online scheduling functionality may help increase overall Program satisfaction and avoid missed opportunities for engaging eligible customers.

- The CY 2012 evaluation recommended implementing online scheduling functionality to improve accessibility of scheduling options and help increase Program participation. Adding online functionality will allow customers to schedule a time slot whenever it is convenient for them. It may also help customers visualize all of their time slot options (and more easily schedule a time) rather than having to talk through options over the phone.
- Implementer staff made adjustment to the scheduling process but still reported a challenge in meeting some of the customers' expectations for available time slots to schedule an audit.

Recommendation 2. Investigate options for implementing an online scheduling system, as indicated in the Mass Markets Portfolio Plan for CY 2013, to address customer requests for more scheduling options. Implementer staff reported that online scheduling capability would increase flexibility of scheduling options and might be helpful in meeting customer scheduling expectations.

Outcome 3. The lack of bulk upload functionality in SPECTRUM during CY 2013 required the Implementer to enter data manually, reducing implementation efficiency and introducing opportunity for human error.

- The Implementer hired and trained temporary employees, which increased the manual data entry and upload efficiency. However, hiring temporary employees both resulted in high labor costs that could have been avoided and introduced a greater risk for human error than an automated system.
- The CY 2012 evaluation found that the bulk upload functionality of SPECTRUM—a solution that both the Program Administrator and Program Implementer approved in CY 2012—would improve the efficiency of the data entry process, conserve costs, and reduce instances of manual data entry error.

Recommendation 3. Prioritize and roll out the bulk upload functionality in SPECTRUM to ease the data entry burden and allow the Program Implementer to concentrate Program resources on implementation.

- The Program Administrator reported that the PSC is researching and developing this functionality.
- Bulk upload functionality will not only make the data entry and upload processes more efficient, but will also allow the Program Implementer to explore new solutions to efficiently and accurately capture field data.

Outcome 4. The Evaluation Team did not have sufficient data to review participation rates or outreach method by communities served by the Program.

While some aggregate information was available for participation rates for all of the communities in both CY 2012 and CY 2013 evaluations, the Evaluation Team did not receive detailed information on community size and outreach methods used in each community.

Recommendation 4. Track the number of households, participation rate, and marketing methods used for all communities served by the Program, if not already doing so, and make these data available for future evaluations. Tracking participation rate and marketing methods by community will provide the information needed to prioritize and identify marketing strategies for outreach to communities with low participation rates, and help increase marketing efficiency by allowing comparative marketing success measurements.

Outcome 5. Despite the Program goal to drive customers to other Focus on Energy programs, only 20% reported they are aware of other programs, and only half of those customers reported they had participated in other programs.

- The Implementer ranked the cross-promotion of other Focus on Energy programs as a high priority, while the Program Administrator considered cross-promotion's main priority to be increased customer awareness of programs, rather than immediate participation.
- Implementer staff said that their field technicians did not always have enough Focus on Energy program materials to leave information with all interested customers.

Recommendation 5. Review the cross-promotion strategy and objectives and provide updated training to field technicians and subcontractors. The Program Administrator and the Program Implementer should reconcile whether the objective should be participation or awareness, and they should identify which programs are best promoted to the Express Energy Efficiency market. This will ensure that the call center and technicians are reinforcing the same message. If both the Program Administrator and Program Implementer agree on a cross-promotional strategy and goals, then the likelihood that all interested customers will receive information on Focus on Energy programs increases.

Outcome 6. As in CY 2012, Program and measure satisfaction remained high, but some customers' dissatisfaction with specific measures led to their removal and impacted overall Program savings.

- The CY 2012 evaluation recommended that the Program reassess the offered bathroom faucet aerator brand and style and explore alternative products. The Implementer did change the type of faucet aerator provided. The Evaluation Team found anecdotal evidence that customer satisfaction with faucet aerators increased, and removal rates decreased in CY 2013.
- Customer satisfaction with other measures did not change markedly from CY 2012 to CY 2013, and satisfaction with measures remains lower than satisfaction with other aspects of the Program.

Recommendation 6. Continue to explore alternative brands and styles of faucet aerators and other measures to maximize energy savings and customer satisfaction. As in CY 2012, and based on CY 2013 customer responses, the Evaluation Team recommends identifying aerators that have improved functionality to avoid customer dissatisfaction that may lead to measure removal.

Outcome 7. In CY 2013, technicians left very few uninstalled measures behind with customers in response to CY 2012 evaluation recommendation.

- The CY 2012 Evaluation Report recommended reinforcing a policy directing technicians not to leave uninstalled measures with customers and to provide training and guidance on how to respond to customer requests to leave extra materials behind.
- The CY 2012 evaluation found that only 78% of customers confirmed that technicians directly installed CFLs. In CY 2013, 95% to 100% of customers surveyed confirmed that the technicians installed all of the measures directly, with a statistically significant difference in the number of customers who reported that technicians directly installed all CFLs.

Outcome 8. In CY 2013, technicians left some extra CFLs behind with customers, who placed the bulbs in storage. This resulted in a lower installation rate.

Recommendation 8. Communicate with technicians to ensure that this practice should not be done. This results in a higher Program *ex ante* claimed savings than should be calculated from the number of bulbs actually installed and in-use.

Outcome 9. The SPECTRUM tracking system exhibited three instances in which a recorded measure did not have any installation savings.

Recommendation 9. Identify or describe the cause for recorded measures with no savings in SPECTRUM. The impact of the Program's savings is quite negligible, but for transparency purposes, it would be beneficial to make note of why these measures did not record any saving

Nonresidential Segment Programs

The nonresidential segment encompasses all customers in the commercial, industrial, institutional, schools, government and agricultural sectors. The CY 2013 evaluation reviewed seven nonresidential segment Targeted Market programs:

- Business Incentive Program
- Chain Stores and Franchises Program
- Large Energy Users Program
- Small Business Program
- Retrocommissioning Program
- Design Assistance Program
- Renewable Energy Competitive Incentive Program

This evaluation was designed to:

- Measure the 2013 energy and demand savings,
- Review the programs' operational and delivery processes, and
- Identify opportunities to improve the programs' efficiency and effectiveness.

Business Incentive Program

The Business Incentive Program (the Program) offers prescriptive and custom incentives for installation of energy-efficiency measures to customers in the agriculture, education, government, commercial, and industrial sectors. Customers with an average monthly demand of 1,000 kilowatts or less and who are not eligible for the Chain Stores and Franchises or Large Energy Users Programs may participate in the Business Incentive Program.[42] Franklin Energy (the Program Implementer) oversees management and delivery of the Program. The Program Implementer primarily relies on Trade Allies to promote and deliver this program to customers, with support from the Implementer staff, Energy Advisors, and Administrator staff.

The savings, participation, spending, and cost-effectiveness values throughout this Program chapter exclude Renewable Energy Competitive Incentive Program measures. Savings, participation, spending, and cost-effectiveness values for Business Incentive Program customers' Renewable Energy Competitive Incentive Program measures appear in the Renewable Energy Competitive Incentive Program chapter of this report.

Table 143 lists the Program's actual spending, savings, participation, and cost-effectiveness.

Table 143. Business Incentive Program Actuals Summary[1]

Item	Units	CY 2013 Actual Amount	CY 2012-2013 Actual Amount
Incentive Spending	$	$ 12,318,989	$ 19,619,393
Verified Gross Life-Cycle Savings	kWh	2,322,016,045	3,572,971,441
	kW	33,112	49,167
	therms	68,068,538	89,423,666
Net Annual Savings	kWh	120,473,489	212,155,281
	kW	21,069	35,316
	therms	5,524,871	7,588,009
Participation	Unique Customers	3,727	6,361
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost ratio	2.99	2.87[2]

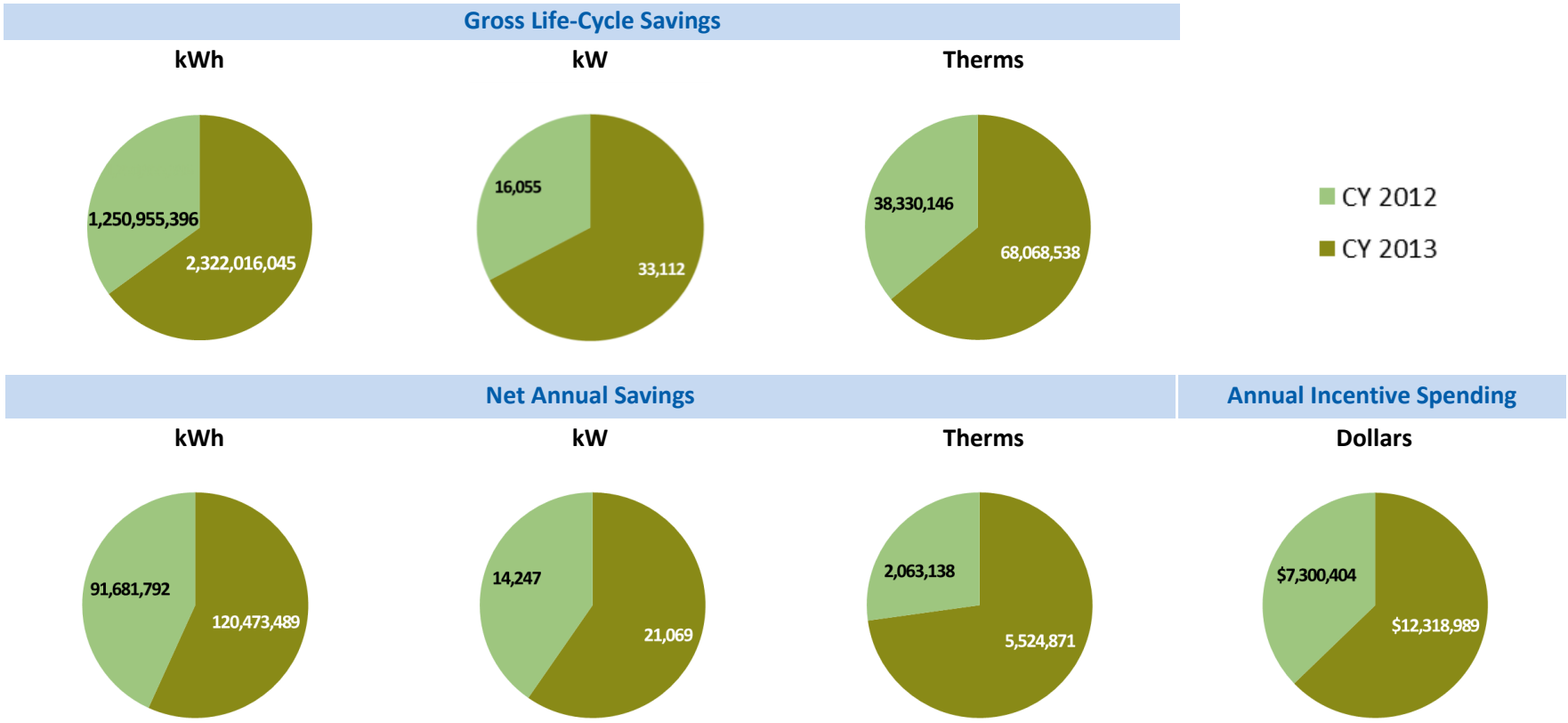
[1]This table presents gross life-cycle savings to allow comparison with Focus on Energy's quadrennial gross life-cycle savings target, and net annual savings to allow assessment of the Program Administrator and Program Implementer's achievement of net annual savings.

[2] The cost-effectiveness ratio is for CY 2012 only.

[42] Small businesses may participate in the Business Incentive Program to receive incentives for energy-efficiency measures that Focus on Energy does not offer in the Small Business Program.

Figure 123 shows a summary of savings and spending progress made in CY 2012 and CY 2013. Note that the Program launched in April 2012 and was only active for nine months during CY 2012.

Figure 123. Business Incentive Program Four-Year (CY 2011-2014) Savings and Budget Progress



Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted impact and process evaluations for CY 2013. The key questions that directed the Evaluation Team's design of the evaluation, measurement, and verification (EM&V) approach were:

- What are the verified gross and net electric and gas savings?
- How effective and efficient are the Program's operations?
- How can the Program's delivery processes cost-effectively increase its energy and demand savings?
- How effective are the Program's marketing, outreach, and communication efforts in reaching targeted customers and influencers?
- What are the barriers to increased customer participation, and how effectively is the Program overcoming these barriers?
- How satisfied are customers and Trade Allies with the Program, and how have satisfaction levels changed since CY 2012?
- Is the Program meeting cost-effectiveness requirements?
- How can Focus on Energy improve Program performance?

The Evaluation Team designed its EM&V approach to integrate multiple perspectives in assessing Program performance. Table 144 lists the specific data collection activities and samples sizes used to evaluate the Program.

Table 144. Business Incentive Program Data Collection Activities and Sample Sizes

Activity	CY 2013 Sample Size (n)	CY 2011-2013 Sample Size (n)
Impact		
On-Site Measurement and Verification	105	211
Project Audit Only	78	194
Process		
Program Administrator and Implementer Interviews	8	23
Trade Ally Focus Groups	33 across four groups	33
Trade Ally Interviews	8	42
Nonparticipant Trade Ally Interviews	-	33
Participant Customer Surveys	210	284
Partial Participant Customer Interviews	-	10

Data Collection Activities

Impact Evaluation

For the impact evaluation, the Evaluation Team conducted a combination of project desk audits and on-site inspections.

The Evaluation Team selected a random sample of projects for audit but focused its on-site measurement and verification activities on measure groups that contributed large amounts of savings to the Program and also represented large sources of uncertainty. Table 145 lists gross savings contributions by measure group, and Table 146 lists the achieved sample sizes.

Table 145. Business Incentive Program Gross Savings Contribution by Measure Group

Measure Group	Percentage of Savings		
	kWh	kW	Therms
Boilers and Burners	1%	-	35%
Compressed Air, Vacuum Pumps	7%	5%	4%
Heating, Ventilation, and Air Conditioning (HVAC)	15%	15%	36%
Lighting	46%	53%	-
Other[1]	19%	23%	23%
Process	7%	2%	2%
Refrigeration	4%	4%	-
Total[2]	**100%**	**100%**	**100%**

[1]The "other" measure group represents agriculture, building shell, domestic hot water, food service, industrial ovens and furnaces, information technology, laundry, motors and drives, new construction, pools, renewable energy, training, vending and plug loads, and wastewater treatment measures. The Evaluation Team condensed these measure groups into one category for this evaluation because the relative contributions of each individual category to the overall Program were small.
[2]Columns may not sum to 100% due to rounding.

Table 146. Business Incentive Program Sample Size for Each Evaluation Activity by Measure Group

Measure Group	Project Audit Only	Project Audit and On-Site Inspection
Boilers and Burners	29	11
Compressed Air	26	38
HVAC Variable-Frequency Drive (VFD)	6	15
HVAC Controls	11	15
Lighting	6	26
Total	**78**	**105**

Project Audits

Project audits consisted of a detailed review of all relevant documentation available through SPECTRUM (the Program database),[43] including:

- Project applications
- Savings worksheets
- Savings calculations performed by participants or third-party contractors (if applicable)
- Energy audits or feasibility studies
- Customer metered data
- Invoices for equipment or contracting services
- Any other documentation submitted to Focus on Energy

As part of the project audits, the Evaluation Team conducted participant surveys consisting of e-mails and follow-up phone conversations to collect information not available in SPECTRUM.

The Evaluation Team developed measure- and category-specific survey forms to facilitate data collection. Each survey form included key parameters, procedural guidelines for the on-site inspectors, and survey questions pertaining to eligibility, facility operations, and general building information.

In addition, the forms typically included the savings algorithms used to determine Program gross savings. The Evaluation Team used these data collection forms for desk-review and on-site inspection projects.

[43] Focus on Energy's Statewide Program for Energy Customer Tracking, Resource Utilization, and Data Management

On-Site Inspections

The Evaluation Team identified measures for on-site inspection using the findings from the CY 2011 and CY 2012 evaluation cycles, selecting individual projects based on their complexity and overall contribution to the gross savings among the sampled projects. Projects sampled for on-site inspections also received project audits. High-priority measures included:

- Variable-frequency drive (VFD), process fans
- VFD, process pumps
- VFD, HVAC fans
- Compressed air measures
- HVAC controls and energy management systems
- Boilers and burners

During on-site inspections, the Evaluation Team verified energy impacts of measures and gathered data for the evaluation of critical delivery issues such as savings input assumptions and the discrepancies between reported and verified savings. The Evaluation Team identified and compiled key parameters for all evaluated measures and compared the actual values, determined from on-site inspections and customer interviews, with the assumed values used to estimate savings.

Inspectors used a variety of specific on-site data collection methods that varied depending on the measure type, often employing stand-alone data-logging devices and performing spot power measurements. When data loggers could not be safely deployed or when metering was not permitted by the customer, inspectors reviewed daily operations and maintenance logs, gathered system set points and operating conditions from central energy management systems, and reviewed the historic trend data, if available. Inspectors also commonly requested a customer initiate trends during a site visit to collect real-time energy consumption data, following up with that customer several weeks later to obtain the results.

Measurement and Verification

Field inspectors primarily performed metering on HVAC fans and pumps, process fans and pumps, and other VFD applications as well as air compressors at commercial, industrial, and governmental facilities. The inspectors followed standard protocol for these measures, which was to either measure load current or true polyphase root-mean-square power using current transducers, watt-hour transducers, and handheld power meters. The Evaluation Team used the collected data to determine project-level realized energy and demand savings.

The Evaluation Team developed custom EM&V plans for many of the projects installing HVAC controls, HVAC VFDs, ventilation control/demand control ventilation, VFD compressors, heat-recovery systems, custom process, and large-scale lighting projects. Typically, senior engineers developed the EM&V plans and reviewed them with the field inspectors prior to the on-site inspection.

Table 147, Table 148, and Table 149 list abbreviated data collection EM&V plans for three of the most-frequently evaluated measures from CY 2013.

Table 147. Sample Data Collection Content and EM&V Plan for VFD Process Pump

Topic Area	Typical Content in EM&V Plan for VFD Process Pump
Recommended EM&V Equipment	Appropriately-rated current transducers, watt-hour transducers, data loggers with external channel input, and handheld power meter.
Required Personal Protective Equipment	Arc-rated face shield, coveralls, and balaclava with minimum arc rating of 8 calories of heat energy per square centimeter (cal/cm^2).
Metering Period/Logging Interval	Deploy loggers for a minimum of two weeks with a sampling interval of 30 seconds.
EM&V Instructions	Deploy current transducers on each leg of the three-phase supplying power to the VFD. Use Fluke power meter to measure voltage, amps, and power factor under all common loading conditions. Obtain copies of pump specifications and performance curves. Collect key parameters.
Key Parameters[1]	Manufacturer and model number, pump horsepower, motor efficiency, VFD efficiency, design gallons per minute (gpm), peak load (kW), baseline method of flow control, and load profile.

[1]Inspectors to gather key parameters for both new and baseline equipment

Table 148. Sample Data Collection Content and EM&V Plan for VFD Air Compressor

Topic Area	Typical Content in EM&V Plan for VFD Air Compressor
Recommended EM&V Equipment	Appropriately-rated current transducers, watt-hour transducers, data loggers with external channel input, and handheld power meter.
Required Personal Protective Equipment	Arc-rated face shield, coveralls, and balaclava (protective head gear required by National Fire Protection Association [NFPA]) with minimum arc rating of 8 cal/cm^2.
Metering Period/Logging Interval	Deploy loggers for a minimum of four weeks with a sampling interval of 30 seconds.
EM&V Instructions	Deploy current transducers on each leg of three-phase service supplying power to the VFD compressor. Use Fluke power meter to measure voltage, amps, and power factor under all common loading conditions. Obtain copies of compressor specifications and Compressed Air and Gas Institute (CAGI) data sheets. Collect key parameters.
Key Parameters[1]	Manufacturer and model number, compressor horsepower, rated pressure (per square inch gage), rated airflow (standard cubic feet per minute), kW at maximum load, method of flow control, compressor type, duty (primary, trim, back up).

[1]Inspectors to gather key parameters for both new and baseline equipment

Table 149. Sample Data Collection Content and EM&V Plan for Boiler Retrofit Project

Topic Area	Typical Content in EM&V Plan for Boiler Retrofit
General Questions	What months during the year does the boiler typically operate?
	Does the system operate year-round?
	Is the boiler used strictly for space heating or is it tied into the domestic hot water system?
	Are there any process loads on the boiler?
Eligibility Questions	Does the boiler meet minimum efficiency requirements?
	Is the combustion unit sealed?
	Is the firing rate modulated?
	Is the model prequalified or approved?
	Is this a back-up boiler?
	Is the rated heating input less than 5,000 MBtu/h (thousand Btus per hour)?
Key Parameters[1]	Manufacturer and model number, input capacity ([MBtu/h), output capacity (MBtu/h), AFUE/thermal efficiency, water temperature set point, heating system set points, and run-hours per year

[1]Inspectors to gather key parameters for both new and baseline equipment

Process Evaluation

For the process evaluation, the Evaluation Team analyzed SPECTRUM data and obtained perspectives from the Program Administrator and Implementer (including Energy Advisors), Trade Allies, and customers.

Program Administrator and Implementer Interviews

The Evaluation Team conducted eight telephone interviews with the Program Administrator and Implementer staff and Energy Advisors. Interviews took place in August 2013. The Evaluation Team also reviewed the Program's status and discussed changes with the Program Implementer during monthly follow-up calls through the end of CY 2013.

Trade Ally Focus Groups and Interviews

The Evaluation Team conducted four focus groups in October 2013 with 33 Trade Allies who completed custom and prescriptive projects in CY 2013 for the Business Incentive, Chain Stores and Franchises, and Large Energy Users Programs.[44] The Evaluation Team segmented the Trade Allies into those who had custom or prescriptive projects (see Table 150). Since fewer Trade Allies worked with custom incentive projects, the Evaluation Team recruited Trade Allies for a custom focus group if they had been involved with at least one custom project receiving incentives in CY 2013, even if they had also worked on prescriptive projects.

Table 150. Trade Ally Focus Groups

Location	Custom Group	Attendees	Prescriptive Group	Attendees	Total Groups	Total Participants
Milwaukee	1	8	1	9	2	17
Appleton	1	8	-	-	1	8
Madison	-	-	1	8	1	8
Total	**2**	**16**	**2**	**17**	**4**	**33**

To supplement data gathered from the focus groups and to gather opinions from Trade Allies serving northwest Wisconsin, the Evaluation Team conducted eight additional in-depth telephone interviews soon after the focus groups, bringing the total number of Trade Ally respondents to 41.

Participant Customer Surveys

The Evaluation Team completed 210 surveys with customers who completed custom and prescriptive projects.[45] The Evaluation Team stratified the participant sample by measure category and project type and fielded the surveys in two waves during September 2013 and November 2013. Final survey disposition numbers by measure stratification are in Table 151.

[44] The Evaluation Team placed greater attention on Trade Ally focus groups and interviews for the Business Incentive Program than for the other programs because Trade Allies played a lead role in serving customers in this Program, whereas Trade Allies collaborated more with Energy Advisors in the other two programs.

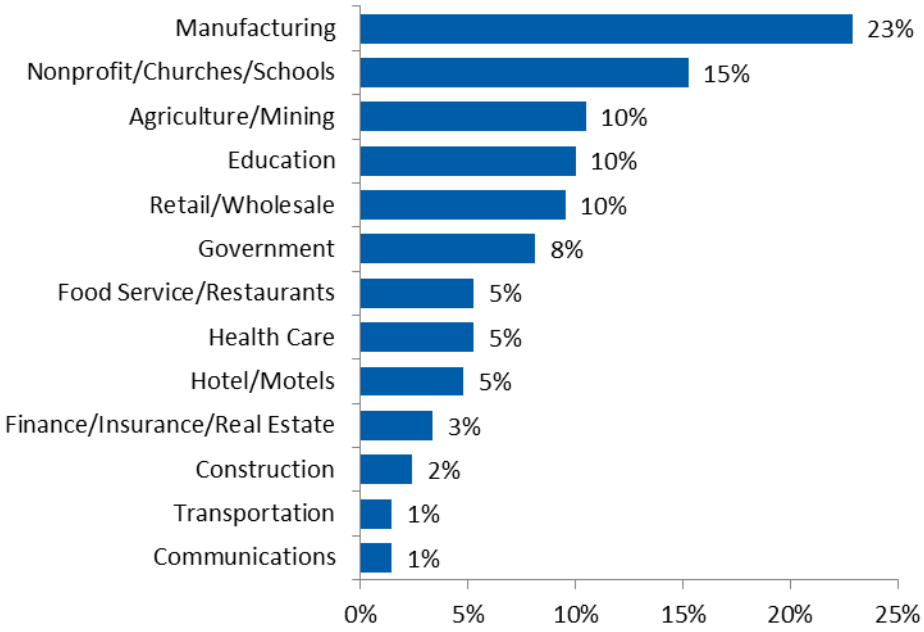
[45] Including nine carryover participants.

Table 151. Participant Survey Completes Stratification

Measure Category	Custom Survey Completes	Prescriptive/Hybrid Survey Completes	Total Survey Completes
Boilers and Burners	2	28	30
Compressed Air	3	26	29
HVAC and VFD	10	29	39
HVAC Controls	0	7	7
Lighting	18	37	55
All Other	20	30	50
Total	**53**	**157**	**210**

As shown in Figure 124, the survey respondents represented many business sectors, with the highest proportions in the manufacturing (23%) and nonprofit/church/school (15%) sectors. Notably, almost all respondents (90%) reported they owned their facilities. In comparison, the total number of customers who completed projects represented the following sectors, as shown in SPECTRUM: 47% commercial, 29% schools and government, 12% industrial, and 12% agriculture.

Figure 124. Participant Survey Respondent Business Types

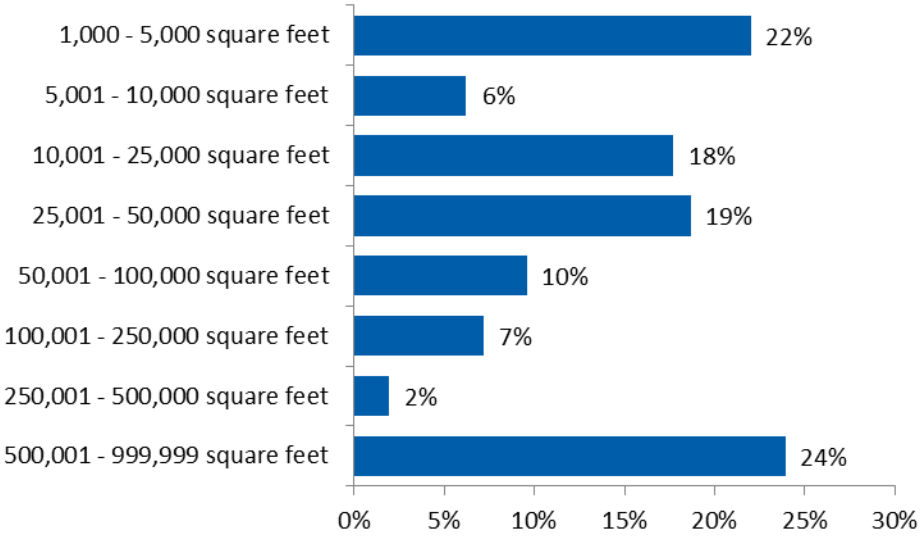


Source: Focus on Energy Business Programs—Business Incentive Program Participant Customer Survey CY 2013
Question K1: "What industry is your company in?" (n=210)

Across all respondents, the facilities averaged approximately 69,500 square feet. Custom projects averaged 110,000 square feet, nearly double the size of prescriptive and hybrid projects (56,000 square feet).[46] The number of employees also varied by project type, with custom projects averaging 200 employees and prescriptive/hybrid project averaging 71 employees.

Figure 125 shows the breakdown of the facility sizes among the participants surveyed; the distribution is heavily weighted at each end, with almost one-quarter of participant facilities either quite small (less than 5,000 square feet) or quite large (over 500,000 square feet).

Figure 125. Business Square Footage



Source: Focus on Energy Business Programs—Business Incentive Program Participant Customer Survey CY 2013
Question K3: "What is the square footage of the heated or cooled square footage in this facility?" (n=209)

Database Analysis

The Evaluation Team analyzed the Program database for two process evaluation-related purposes:

- Assess the length of time in SPECTRUM to process applications (preapproval and incentive processes).
- Evaluate changes in participation and savings from CY 2012 to CY 2013 by project type (custom, prescriptive, hybrid).

[46] Hybrid projects are those that include HVAC equipment and electric motors with prescriptive incentives but receive some technical review by Focus on Energy.

Impact Evaluation

To calculate gross savings, the Evaluation Team reviewed the Program tracking data in SPECTRUM and data The Evaluation Team collected during on-site inspections and in-person interviews.

Evaluation of Gross Savings

For prescriptive and hybrid measures in the Business Incentive Program, the Evaluation Team determined gross savings using the following two approaches:

- **Deemed Approach:** The Evaluation Team calculated project savings using assumptions from current work papers and Focus on Energy's 2010 Deemed Savings Manual, with some parameter adjustments based on findings from on-site inspections and customer interviews. The Evaluation Team made adjustments for the following circumstances:
  - Reported quantities did not match the verified quantities in the field.
  - Equipment specifications, such as capacity, efficiency, used in Program calculations did not match the specifications for the installed equipment.
  - The methodology used to stipulate Program savings was not transparent or there were apparent errors in Program savings calculations.
- **Verified Approach:** The Evaluation Team calculated project savings using data from on-site metering, on-site inspections, and interviews with customers, along with Program assumptions as necessary.

Tracking Database Review

The Evaluation Team reviewed the CY 2013 data in SPECTRUM for completeness and quality. The data were thorough and complete; SPECTRUM generally contained all of the data fields necessary to evaluate the Program. In general, the extent and quality of project documentation will increase with project complexity. The Evaluation Team consistently found supplemental documentation such as savings worksheets, calculations performed by participants or third-party contractors, energy audits, feasibility studies, product specifications, and invoices for equipment or contracting services in SPECTRUM for the hybrid and custom category measures as well as some of the more complex prescriptive measures (e.g., compressed air, HVAC, and VFD).

The Evaluation Team found that application documents aligned with applicant, facility, and measure-eligibility requirements. The Evaluation Team also found participant and third-party savings algorithms were appropriate.

Gross and Verified Gross Savings Analysis

The Evaluation Team used data from the project audits and on-site inspections to analyze each sampled project. Project analysis relied on standardized measure- or category-specific Microsoft® Excel-based calculators, which the Evaluation Team developed for the CY 2013 evaluation.

In addition to Program data, the Evaluation Team used deemed assumptions and algorithms to verify measure-level savings. The Evaluation Team developed the assumptions and algorithms using measure work papers and the 2010 Deemed Savings Manual for prescriptive and hybrid measures. For measures not explicitly addressed in a work paper or the 2010 Deemed Savings Manual, the Evaluation Team developed savings algorithms and assumptions based on engineering judgment and best practices from other statewide Technical Reference Manuals. Typically, the Program Implementer classified such measures as custom measures in SPECTRUM.

Also as a part of the CY 2013 evaluation, the Evaluation Team developed a list of key parameters for common measures offered by the Program and compared the evaluated values with the stipulated values used in work papers and the 2010 Deemed Savings Manual. Based on the findings of this analysis, the Evaluation Team assessed the validity of the stipulated values used to estimate Program savings. The following sections discuss the key findings from the analysis.

VFD Load Profiles

The Evaluation Team compiled the deemed load profiles used to estimate Program savings and the actual load profiles determined from evaluation activities into an Excel database for all sampled VFD projects. The Evaluation Team then compared deemed profiles to the evaluated profiles in order to assess the validity of the Program assumptions. Table 152 and Table 153 list the deemed and evaluated values for the VFD projects.

Table 152. VFD Load Profile Comparison: Deemed vs. Actual (Evaluated)

Percentage of Load	VFD Application							
	HVAC Fan (n=22)		CW Pump (n=4)		Process Fan (n=12)		Process Pump (n=35)	
	Deemed	Actual	Deemed	Actual	Deemed	Actual	Deemed	Actual
100%	-	-	62.8%	-	12.2%	9.5%	6.8%	6.6%
90%	5.0%	0.3%	-	6.0%	25.0%	16.6%	12.0%	21.9%
80%	-	2.5%	-	1.4%	25.0%	16.6%	17.4%	14.3%
70%	25.0%	8.5%	37.2%	21.4%	25.0%	39.6%	21.2%	20.7%
60%	-	8.2%	-	6.3%	12.8%	8.7%	18.3%	13.6%
50%	40.0%	13.1%	-	14.0%	-	1.1%	12.9%	8.0%
40%	30.0%	32.8%	-	26.9%	-	1.8%	7.5%	6.8%
30%	-	6.2%	-	23.9%	-	2.6%	3.9%	6.3%
20%	-	28.3%	-	-	-	3.3%	-	1.8%

Table 153. Comparison of Deemed vs. Actual Values for VFD Projects

VFD Application	Deemed			Actual		
	Avg. Run-Hours	Avg. % Load	Avg. EFLH[1]	Avg. Run-Hours	Avg. % Load	Avg. EFLH
HVAC Fan	5,224	54.0%	2,821	4,437	40.4%	1,791
Chilled Water Distribution Pump	5,880	54.0%	3,175	7,551	50.3%	3,795
Process Fan	6,494	79.9%	5,186	6,031	73.5%	4,433
Process Pump	5,752	68.0%	3,911	5,490	69.4%	3,808

[1] Equivalent full-load hours (EEFLH)

As illustrated by the findings, the deemed load profiles used by the Program for VFD chilled water pumps, process fans, and process pumps were reasonably accurate and appropriately conservative.

Realization Rates

After determining verified savings for each project, the Evaluation Team calculated project-level realization rates and rolled up weighted average results to the measure level. The Evaluation Team multiplied measure-level Program gross savings by the corresponding measure-level realization rate to arrive at total verified gross savings (see Table 155).

Overall, the Program achieved an evaluated realization rate of 99%. For each sampled project, the Evaluation Team used data from project audits and on-site measurement and verification to calculate verified savings for the project. For each identified measure group, the Evaluation Team calculated the realization rate by dividing the total verified gross savings by the total reported gross savings. This approach calculates the weighted average realization rate for each measure group.

Savings for measure groups not identified in the table were not modified based on reviews of work papers submitted by the Program Implementers. Table 154 outlines the realization rates by measure group achieved by the Program in CY 2013.

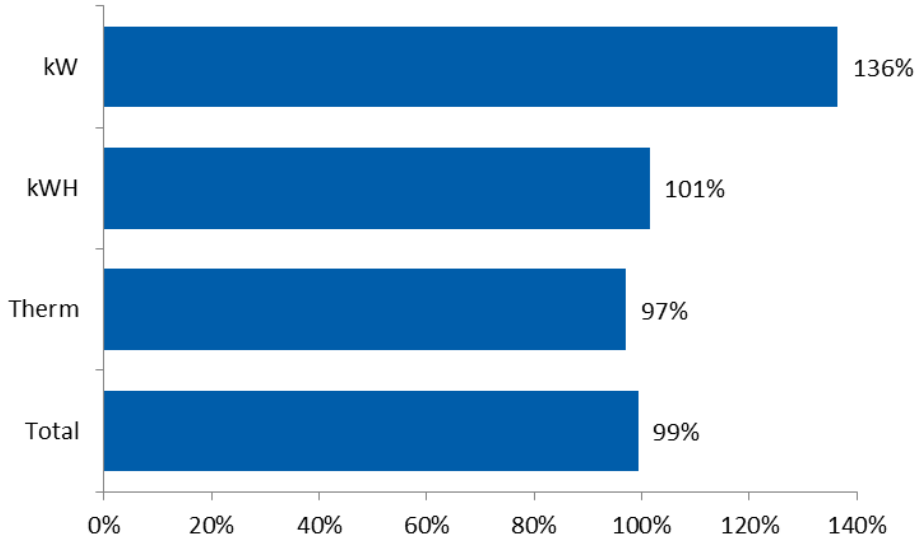
Table 154. Business Incentive Program Realization Rates by Measure Group

Measure Group	Realization Rate			
	kWh	kW	Therms	MMBtu
Boilers and Burners	100%	100%	94%	94%
Compressed Air	86%	108%	89%	87%
HVAC Controls	94%	64%	108%	100%
HVAC VFD	91%	100%	100%	91%
Lighting	107%	160%	100%	107%
Total	**101%**	**136%**	**97%**	**99%**

Carryover projects are projects that obtained approval under the prior legacy programs and reached completion after the new programs launched in April 2012. The Evaluation Team included some of these projects in the sample design. Due to the relatively small sample size of the carryover projects, the Evaluation Team included these projects when calculating the realization rate for their respective measure groups.

Figure 115 shows the realization rate by fuel type.

Figure 126. Business Incentive Program Realization Rate by Fuel Type



Gross Savings and Verified Gross Savings Results

To calculate the total verified gross savings, the Evaluation Team applied measure-level realization rates to the savings of each measure group. Savings listed as current pertain to projects approved and completed under the current Business Incentive Program, whereas savings listed as carryover pertain to projects approved under the legacy programs but completed after the new Program launched in April 2012. The Program includes two components called the Emerging Technology Program and the Renewable Energy Competitive Incentive Program,[47] which are tracked as independent line items. Table 155 lists the total and verified gross savings, by measure type, achieved by the Business Incentive Program in CY 2013.

[47] A separate chapter details the Renewable Energy Competitive Incentive Program.

Table 155. Business Incentive Program Gross Savings Summary

Project Type	Reported Gross			Verified Gross		
	kWh	kW	Therms	kWh	kW	Therms
Current Annual	150,187,694	20,641	5,087,715	152,429,054	28,399	4,938,554
Current Life-Cycle	1,934,860,554	20,641	48,834,420	1,967,412,414	28,399	47,321,583
Carryover Annual	24,004,623	4,470	1,453,315	24,055,036	4,713	1,454,468
Carryover Life-Cycle	354,024,383	4,470	20,731,240	354,603,631	4,713	20,746,955
Total Annual	174,192,317	25,111	6,541,030	176,484,089	33,112	6,393,023
Total Life-Cycle	2,288,884,937	25,111	69,565,660	2,322,016,045	33,112	68,068,538

Evaluation of Net Savings

This section describes how the Evaluation Team assessed net savings for the Business Incentive Program.

Net-to-Gross Analysis

This section provides findings and commentary specific to the Business Incentive Program. For a detailed description of net-to-gross analysis methodology, please refer to Appendix L.

Freeridership Findings

The Evaluation Team used the self-report and standard market practice approaches to determine the Program's freeridership level. Table 156 identifies the freeridership approach the Evaluation Team applied to each Program measure type.

Table 156. Business Incentive Program Freeridership Estimation Approach by Measure Group

Freeridership Estimation Approach	Measure Group
Self-Report and Standard Market Practice	Boilers & Burners Lighting
Self-Report	Agriculture Building Shell Compressed Air, Vacuum Pumps Domestic Hot Water Food Service Industrial Ovens and Furnaces Information Technology Laundry Motors & Drives Pools Process Refrigeration Renewable Energy Training & Special Vending & Plug Loads Waste Water Treatment HVAC

Self-Report Freeridership Estimates

The Program had average self-report freeridership of 38.0% in CY 2013. This freeridership rate represents a 17% increase from CY 2012, when the Program had a weighted average self-report freeridership rate of 21%. Compared with CY 2012 survey respondents, more CY 2013 respondents were 100% freeriders, and fewer were 0% freeriders.

As Table 157 shows, freeridership was similar between current and carryover projects.

Table 157. CY 2013 Business Incentive Program Self-Report Freeridership Estimates by Project Type

Project Type	Self-Report Freeridership Estimate
Current Program	37.2%
Carryover Projects from Legacy Programs	40.1%
Overall	**38.0%**

Next, the Evaluation Team analyzed freeridership by project size in CY 2012 and CY 2013. The Evaluation Team determined that freeridership for the largest projects in the survey sample increased significantly from year to year. In CY 2012, the three respondents with the highest gross energy savings accounted for 43% of the survey sample's total gross savings, and all three respondents were 0% freeriders. In CY 2013, the three respondents who achieved the greatest savings accounted for 27% of the total gross savings for the survey sample, and one of the top three energy savers was a 75% freerider.

Standard Market Practice Freeridership Estimates

The Evaluation Team used standard market practice data to estimate freeridership for two measure groups: Boilers & Burners and Lighting. Table 158 shows the standard market practice freeridership value for each group.

Table 158. CY 2013 Business Incentive Program Standard Market Practice Freeridership Estimates by Measure Group

Measure Group	Standard Market Practice Freeridership Estimate
Boilers & Burners	61.7%
Lighting	73.0%

Overall Freeridership Estimate

By combining the self-report and standard market practice freeridership data, the Evaluation Team estimated that the Business Incentive Program had overall average freeridership of 46% in CY 2013.

Spillover Findings

The Evaluation Team estimated participant spillover based on self-report survey data. Table 159 shows the spillover measures customers said they installed as a result of their program participation.

Table 159. Business Incentive Program Spillover Measures

Measure Name	Quantity	Per-Unit Btu Savings[1]	Total Btu Savings[1]
LED Lighting	237	849,623	201,360,714
Outdoor Lighting	20	2,165,004	43,300,077
Fluorescent Tube Lighting	1806	759,543	1,371,734,164
High Efficiency Motor	1	3,739,025	3,739,025
Central AC	14	3,279,068	45,906,953
Variable Speed Drive	107	85,221,968	9,118,750,602
Boiler	1	191,754,215	191,754,215
Room Air Conditioner	80	4,771,198	381,695,811
HVAC Unit	3	3,279,068	9,837,204
Irrigation Equipment	1	108,195,599	108,195,599
Total	**2,270**		**11,476,274,364**

[1] The Evaluation Team used MMBtu to weight the responses across participants for both electric and gas savings.

The Evaluation Team estimated spillover as 18% of Program savings. As Table 160 shows, spillover varied significantly between current program projects and carryover projects from the legacy programs.

Table 160. CY 2013 Business Incentive Program Spillover Estimates

Project Type	Spillover Estimate
Current Program	6.6%
Carryover Projects from Legacy Programs	46.2%
Overall	**17.6%**

Program spillover was higher in CY 2013 (18%) than in CY 2012 (7%). The main factor for increased spillover in CY 2013 was one carryover project participant who reported installing 100 VFDs at multiple locations following participation in the Program; this participant rated Program participation as "very important" in the decision to purchase and install the additional VFDs.[48]

Net-to-Gross Ratio

The Evaluation Team calculated an overall Business Incentive Program net-to-gross estimate of 71%, as Table 161 shows.

Table 161. CY 2013 Business Incentive Program Freeridership, Spillover, and Net-to-Gross Estimates[1]

Measure Type	Freeridership	Spillover	Net-to-Gross
Overall	**46%**	**18%**	**71%**

[1] Weighted by distribution of evaluated gross MMBtu energy savings for the Program population.

[48] The Evaluation Team confirmed through a follow-up survey question that the VFDs did not receive an incentive from Focus on Energy. This same respondent reporting installing CFLs following participation in the Business Incentive Program at other locations throughout the school district but rated Program participation as "not at all important" in the decision to purchase and install the additional CFLs.

The Program's net-to-gross ratio declined by 15 percentage points from 86% in CY 2012. The Evaluation Team determined that freeridership increased, largely because of an increase in reported freeridership from some of the largest participants in CY2013. Although spillover also increased, the increase was not sufficient to offset the increase in freeridership. Finally, it should be noted that the participant survey sample sizes were larger in CY 2013 (n=198) than in CY 2012 (n=74), which means that the two years' results have different levels of confidence and precision. For detailed information on confidence and precision, please refer to Appendix K.

It is important to note that the CY 2012 net-to-gross estimate was noticeably higher than prior findings in Wisconsin. As the Evaluation Team noted in the CY 2012 evaluation report, the net-to-gross ratio prior to the CY 2012 evaluation was 60% for lighting measures and 45%for HVAC.[49] The results of the CY 2013 net-to-gross analysis are similar to estimates prior to the CY 2012 evaluation.

Net Savings Results

Table 162 shows the net energy impacts (kWh, kW, and therms) for the Business Incentive Program. The Evaluation Team attributed these savings net of what would have occurred without the Program.

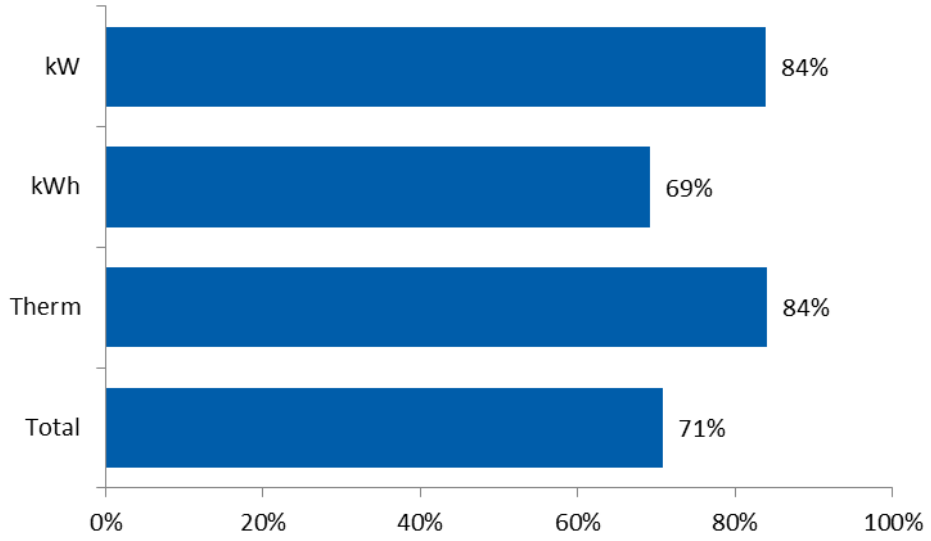
Table 162. CY 2013 Business Incentive Program Net Savings

Project Type	Savings Type	Verified Net		
		kWh	KW	Therms
Current Program	Annual	94,948,510	16,067	3,981,524
	Life-cycle	1,256,237,770	16,067	38,208,791
Carryover Program	Annual	25,524,978	5,001	1,543,347
	Life-cycle	376,272,563	5,001	22,014,749
Total Savings	Annual	120,473,489	21,069	5,524,871
	Life-cycle	1,632,510,332	21,069	60,223,541

Figure 116 shows the net savings as a percentage of the *ex ante* gross savings by fuel type.

[49] The Evaluation Team based the stipulated net-to-gross ratios used in CY 2011 upon the results of the CY 2010 evaluation.

Figure 127. Business Incentive Program Net Savings as a Percentage of *Ex Ante* Savings by Fuel Type



Process Evaluation

Within the broader research questions, the Evaluation Team sought answers to several important process-specific questions:

- How effective is the Program design at driving deeper savings?
- How clear are the Program eligibility requirements to the market?
- How user-friendly are Program application forms for Trade Allies and customers?
- How efficient and timely are project preapproval and application processes?
- How effective is the communication and management of Trade Allies?

Program Design, History, and Goals

Focus on Energy launched the Program in April 2012 as one of three core programs organized around energy usage and organizational decision-making instead of industry sectors. In CY 2013, Administrator staff said that moving from a sector-based program to a program based on energy usage posed some challenges because they thought customers identified with a sector more than with their level of energy use. They also noted that the Program Implementer had launched several sector-specific special offerings during the year.

The Program Administrator tracked several internal metrics to monitor the Program Implementer's performance (see Table 163). Implementer staff reported the progress (through December 2013) to the Program Administrator for each metric.

Table 163. Business Incentive Program Internal Metrics

Metric	Standard	CY 2013 Progress
Geographic Distribution	Every eligible Wisconsin business has a registered Trade Ally within a 100-mile radius.	Satisfied
Customer Distribution	At least 10% of Program budget is allocated for spending on local government (municipalities, counties, public schools, technical colleges) and agricultural entities combined.	Satisfied (spent almost 22%)
Prescriptive Application Processing	The Program Implementer's average number of days to process prescriptive applications through the Program Implementer's payment approval workflow in SPECTRUM will be less than 20 days for all applications received after July 31, 2013.	Satisfied (12.2 average days)
Preapproval Processing Time	The Program Implementer's average number of days to process measures through the Implementer preapproval workflow will remain under 20 days.	Satisfied (10.6 average days)
Trade Ally Outreach	On a monthly basis, contact at least 100 Trade Allies via phone or in-person visit.	Satisfied (375 Trade Allies per month on average)

Program Changes

In CY 2013, Focus on Energy made the following changes to the Business Incentive Program:

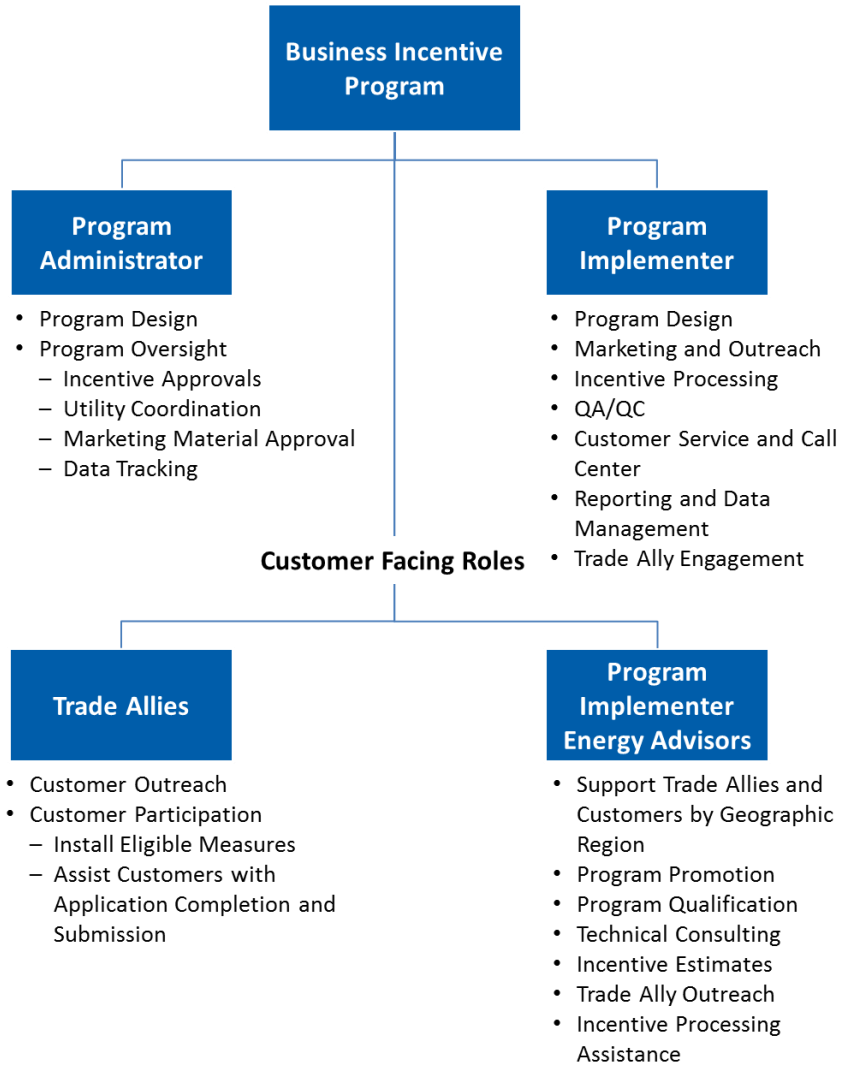
- Modified some incentive offerings and requirements
- Introduced a new website designed to improve ease of finding information and completing application forms
- Began tracking Program savings on a life-cycle basis (in previous years savings had been tracked only on an annual basis)

Another change the Implementer said it was gradually making is shifting the Program's focus away from custom projects because these projects are more laborious for customers, Trade Allies, and the Implementer. Deeper savings was mentioned as a key goal of the Focus on Energy programs in the 2013 Work Plan. However, the Evaluation Team found that custom projects provided significantly more savings per project (deeper savings) in CY 2013.

Program Management and Delivery

The Evaluation Team reviewed changes in Program roles and responsibilities, resources for delivery, application approval and review processes, and Program data management for the CY 2013 evaluation. Figure 128 shows a diagram of key actors in the Program.

Figure 128. Business Incentive Program Key Program Actors and Roles



Management and Delivery Structure

In CY 2013, the Administrator's Business Incentive Program Manager transitioned to managing the Chain Stores and Franchises Program as well. The Administrator reported this change helped to streamline communication and management duties for both programs. The Program Implementer transitioned and dedicated field staff exclusively to either the Business Incentive Program or to the Chain Stores and Franchises Program. This change addressed a concern the Evaluation Team identified in the CY 2012 evaluation regarding the ability of field staff to allocate attention needed to each program when assigned to support both programs.

On October 1, 2013, the Program Implementer took over all responsibilities previously assigned to a subcontractor (Lockheed Martin). The subcontractor was responsible for technical quality assurance/quality control (QA/QC) preapproval and payment reviews, the customer service call center,

and prescriptive incentive processing. Implementer staff reported that it took some time to fill positions to oversee processing and administration activities during the transition.

Resources for Program Delivery

During the interviews, the Evaluation Team asked the Administrator and Implementer if resources were sufficient to efficiently and successfully deliver the Program. The Administrator's Program Manager identified the following areas as potentially understaffed or needing more resources:

- Management of the Trade Ally network
- Support of multiple customer sectors and Trade Allies
- Production of high-quality materials and training for Trade Allies
- Delivery of the Program's technical requirements such as:
  - Developing technically complex "Technical Reference Manual-grade" work papers for new measures
  - Conducting the detailed application review process
- Maintenance of SPECTRUM

The Energy Advisors also said customers and Trade Allies often required a lot of assistance while participating in the Program and additional resources would help ensure better services to those groups. In CY 2013, approximately 20 Energy Advisors were responsible for supporting more than 1,200 Trade Allies and 3,600 customers with technical or sector-specific assistance and processing applications for preapproval and incentive-payment approval.

To manage the Trade Ally communications and support, the Program Implementer developed a system for categorizing Trade Allies into three specific tiers based on how active they are in the Program. Table 164 shows the number and percentage of registered and nonregistered Trade Allies active in each tier in CY 2013.

Table 164. Business Incentive Program Trade Ally Activity Tiers

Trade Ally Ranking Group	CY 2013 Business Incentive Program Ranked Trade Allies (Registered and Nonregistered)	
	Count	Percentage
Tier 1 (most active)	65	5%
Tier 2 (moderately active)	161	13%
Tier 3 (completed at least one project)	1,001	82%
Total	**1,227**	**100%**

The Program Implementer used these tiers to guide the level of communication and outreach to Trade Allies and determine outreach performance metrics for the Energy Advisors. The Program Implementer assigned Energy Advisors a specific number of Trade Allies to manage, based largely on geographic location. The Evaluation Team interviewed a sample of Energy Advisors who reported managing

between approximately 150 and 500 Trade Allies but regularly communicated with only about 10% of them (the most active).

Energy Advisors said that time constraints made it difficult to contact every Trade Ally and that they focused their attention on Tier 1 contacts; they did not have the time to really engage with and educate the lower-tier Trade Allies. The Energy Advisors said that managing fewer Trade Allies or dedicating more staff to building Trade Ally relationships would help.

Program Data Management and Reporting

Administrator and Implementer staff said the lack of customer relationship management (CRM) features in SPECTRUM was something they would like to see addressed and that they still plan to add CRM functionality to SPECTRUM. Currently, entering application forms is a manual process.

In addition, the Program Implementer maintains a separate Microsoft Access database to track Trade Ally contacts and projects in the pipeline. Energy Advisors log phone calls and visits to Trade Allies into this database, using it as a customer relationship management tool. The database also displayed savings in various ways—by Energy Advisor, dates, project status, and probability of project completion.

Marketing and Outreach

In CY 2013, the Program Implementer relied primarily on Trade Allies to market the Program to customers, assigning each Energy Advisor a group of Trade Allies to communicate with and support. Outreach to Trade Allies included webinars and frequently asked questions (FAQ) sheets with Program updates; e-mails, phone calls, in-person visits from Energy Advisors; and training sessions. Registered Trade Allies received a monthly newsletter and had access to Program information on the website. The Program Implementer also offered distributor or contractor "Energy Desk Days" when Program representatives were available to answer questions at a distributor location. The Implementer said it also developed a customizable e-mail template for Energy Advisors to send Trade Allies Program updates.

The Program Implementer reported it supplied Trade Allies with forms, business cards, fact sheets, equipment lists, marketing collateral that could be co-branded and customized, and other outreach materials. In CY 2013, Implementer staff said they were more successful in delivering marketing and outreach materials to Trade Allies prior to a special offering or new incentive than in CY 2012. However, most Trade Allies reported they either had not received or did not extensively use Focus on Energy marketing materials for their business customers.

The Program Implementer also promoted limited-time special offers to increase participation by targeted customers. For example, starting in August 2013, the Program Implementer through a marketing blitz at an industrial park, focused on outreach activities to industrial customers with a high potential for lighting energy savings. Industrial projects in the Program realized 40% of their overall CY 2013 kWh savings during the period from August to December. The Program Implementer also offered

bonuses to schools and the government sector, promoting multiple projects within facilities as well as a steam trap survey and repair bonus.

Trade Allies said the deadlines for limited-duration special offerings were often unrealistic, leading them to forgo these opportunities. For example, one Trade Ally said he thought a special offer for gas station canopy lights lasted one and a half months—a timeline too short to find customers and develop projects with the appropriate decision-makers. Even though the incentive was considerable, this Trade Ally did not take part.

To measure the success of special offerings, the Program Implementer developed a performance summary, including an assessment of forecasted to actual savings and costs.

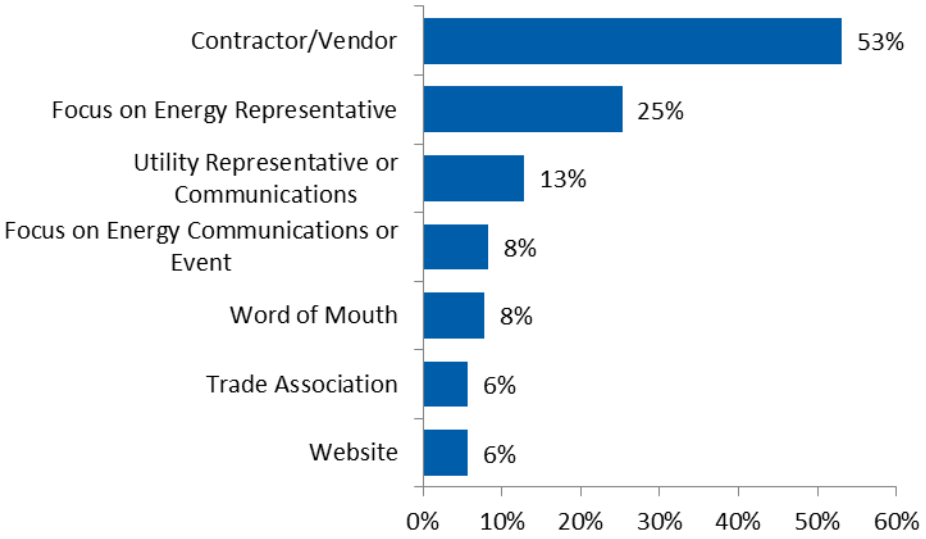
Outreach to Trade Allies

In CY 2012, the Program Implementer focused on registering or re-enrolling as many Trade Allies as possible into the Focus on Energy's Trade Ally network. In CY 2013, the Implementer and Administrator staff said they had shifted away from registering a lot more Trade Allies (a *quantity* approach) and instead focused on the *quality* of outreach and communications to existing Trade Allies. To do this, Implementer staff said they focused outreach and communication efforts on Trade Allies with higher potential and historically high participation rates rather than trying to provide all Trade Allies with the same level of attention.

Outreach to Customers

Consistent with the Program design and feedback from Trade Allies, most surveyed customers said they had heard about the Program through a contractor or vendor, followed by direct contact with a Focus on Energy representative, as shown in Figure 129.

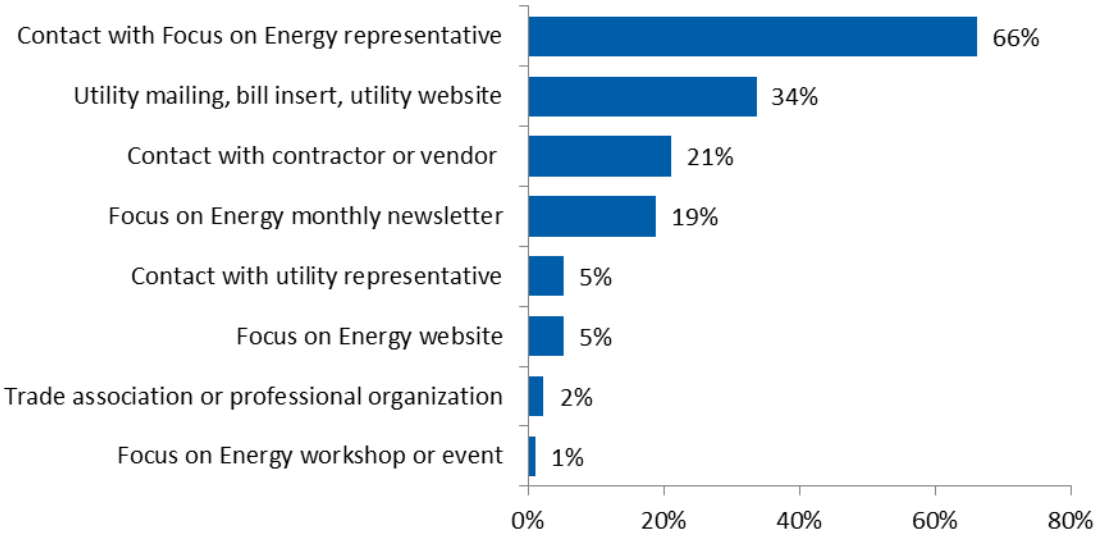
Figure 129. How Customers Learned About the Business Incentive Program



Source: Focus on Energy Business Programs – Business Incentive Participant Customer Survey CY 2013 Question B2: "How did your organization learn about the incentives available for this project from Focus on Energy?" (n=194; multiple responses allowed).

When asked if they remembered hearing about Focus on Energy from their utility, about one-half of the survey respondents said yes. For respondents who had heard about the Program through their utility, they said they usually heard about it through a utility mailing, bill insert, or representative. Figure 130 shows participants' preferences for staying informed about the Program.

Figure 130. Participants' Preferences for Staying Informed About the Program



Source: Focus on Energy Business Programs – Business Incentive Program Participant Customer Survey CY 2013 Question L1: "In the future, how would you like to stay informed about opportunities to save energy and money?" (n=175; multiple responses allowed).

Customers with custom, prescriptive, and hybrid projects had similar responses, although those with custom projects reported a preference for contact with a Focus on Energy representative—82% compared to 61% of the respondents with prescriptive projects.

The Program Implementer conducted direct marketing to customers through trade associations, conferences, and the Focus on Energy website. The Program Implementer participated in 17 different events during CY 2013 and connected with customers through a variety of trade associations. Implementer staff tracked detailed statistics about customer traffic and interactions with Program content on the Focus on Energy website using Google Analytics™. The Program Implementer was also assessing how to expand its current methods for tracking website interactions.

Focus on Energy Website

During the early part of CY 2013, Focus on Energy released an updated website which featured a streamlined design with tabs that more clearly separated information for residential customers, business customers, and Trade Allies.

Just over half of the customer survey respondents (n=100) said they were "very satisfied" with the website, which was the lowest proportion of "very satisfied" responses in comparison to other Program areas.[50] Forty-nine percent of customers who said they were less than "very satisfied" (n=46) said they

[50] Some customers may have based their ratings on experience with the old Focus on Energy website before the redesign.

thought the website was hard to navigate or it was hard to find what they needed. Other responses included:

- "It is kind of cumbersome… confusing… not user friendly."
- "Not enough information and not easy to use."
- "The paperwork was lost online."

The Evaluation Team also asked Trade Allies about their experiences with the Focus on Energy website. The majority of Trade Allies in focus groups reported having difficulty finding incentive application forms after the website updates. Most of the Trade Allies who initially had difficultly navigating the website said that once they learned the location of application forms, navigating the website became easier over time. One Trade Ally commented, "It's [navigating the website] easy for us now because we know how to find the stuff."

During focus groups, a few Trade Allies mentioned that the website contained too much extraneous information "comingled together" with important information. Trade Allies said they wanted the content simplified and specific to Program incentives, Program changes, and application forms. One Trade Ally suggested including a "nuts and bolts" section or separate Trade Ally login to a website without extraneous information. As this Trade Ally explained, "…I don't need to know how a compact fluorescent works…I don't need to know 80% of what's on the website… I need to know what [are] the incentives today, when do they expire, and what are the levels and bonuses…which applications do I need and an easy link to each of them."

Administrator staff reported better organization of content on the new website but continuing challenges with navigation such as the need to click through multiple pages to access Program documents (e.g., application forms).

Program Satisfaction

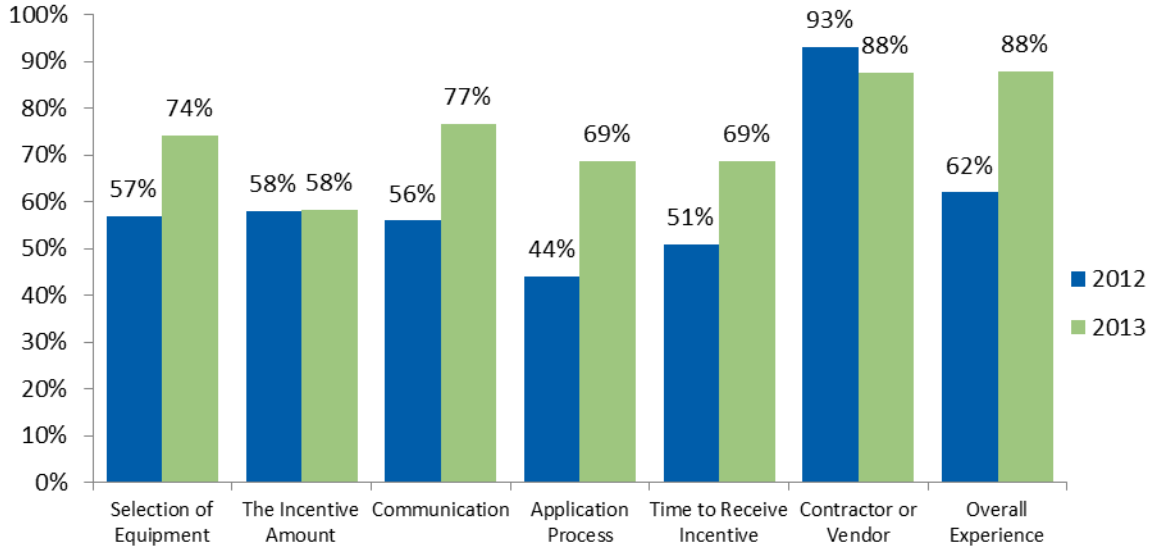
This section presents an overview of customer and Trade Ally ratings of Program satisfaction.

Customer Satisfaction

Participants reported high overall satisfaction levels with the Program in CY 2013, higher than reported in CY 2012 (see Figure 131). A large majority (88%) of the survey respondents rated their overall satisfaction with the Program as "very satisfied," compared to 62% of respondents in CY 2012.

Customers also reported higher satisfaction levels during the CY 2013 evaluation for the selection of equipment, communication with Focus on Energy representatives, and the time it took to receive the equipment. Satisfaction with the contractors remained steady and high in CY 2013 (88%). Satisfaction ratings for the incentive amount did not change (58% "very satisfied"), but was low compared to most other ratings.

Figure 131. Very Satisfied Responses by Calendar Year



Source: Focus on Energy Business Programs—Business Incentive Program Participant Customer Survey CY 2013 Question F1: "I will ask about some different parts of the project. Please indicate if you are very satisfied, somewhat satisfied, not too satisfied, or not at all satisfied with each of these areas." (n≥47).

Although overall satisfaction with the Program and contractor or vendor is high, survey respondents rated their satisfaction with individual aspects of the Program lower. The Evaluation Team asked participants why they were less than "very satisfied" with the different Program topics. Customers reported similar issues with the Program such as process taking too long (e.g., incentive application, custom preapproval process, receiving incentive check) or confusing or complex content or processes (e.g., application process, custom preapproval process, eligibility requirements, website).

The eligibility requirement and incentive amount categories received the highest number of ratings that were less than "very satisfied." Table 165 summarizes the reasons survey respondents were not satisfied with various aspects of the Program.

Table 165. Why Customers Surveyed Were Not "Very Satisfied"

Question Topic	Sample Size (n)	Reasons Given by Respondents
Your experience with the contractor or vendor	20	• Problems with installation or equipment (35%) • Lacked knowledge about product (25%) • Energy savings was overstated (5%)
Communication with Program representatives	36	• Do not know who the representative was or the representative kept changing (14%)
Incentive application process	21	• Took a long time to fill out or paperwork was too complex (57%)
The time it took to receive the incentive	44	• Took too long (82%)
The custom project preapproval process	16	• Took too long (42%) • Did not understand process (19%) • Amount of detailed information they are required to submit is too much (13%)
Clarity of project eligibility requirements	72	• Requirements were confusing (35%) • Information was not clear (17%) • Too much "red tape" (15%)
The incentive amount	71	• Too low, especially relative to total cost of project (69%)
The Focus on Energy website	37	• Hard to navigate (49%) • Complicated to use (19%)

Source: Focus on Energy Business Programs—Business Incentive Program Participant Customer Survey CY 2013

Trade Ally Satisfaction

Overall, Trade Allies reported the highest satisfaction levels with the overall support they received from Focus on Energy representatives, communication with Focus on Energy representatives, and clarity of the Program's eligibility requirements.

Trade Allies in the custom focus groups were notably less satisfied than those in the prescriptive focus groups and interviews in three key areas:[51]

- ***Training:*** Seven out of 17 Trade Allies in the custom groups were "not satisfied" with Focus on Energy training. None of the Trade Allies in the prescriptive groups or interviews gave a "not satisfied" rating.

[51] See Appendix R for a table of the results of this exercise by segment.

- ***Outreach and Marketing Materials:*** Eight out of 17 Trade Allies in the custom groups were "not satisfied" with the outreach and marketing materials the Program provides, compared to four out of 24 Trade Allies in the prescriptive groups.
- ***Timeliness of Incentive Payments:*** Eight out of 17 Trade Allies in the custom groups were "not satisfied" with the time it took to receive an incentive from Focus on Energy, compared to two out of 24 Trade Allies in the prescriptive groups.

Trade Allies in the custom focus groups also reported low satisfaction with the custom project preapproval process (eight out of 17 were "not satisfied") and custom incentive application forms (four out of 17 were "not satisfied").

Table 166 shows the Trade Ally satisfaction ratings.

Table 166. Trade Ally Satisfaction Ratings[1]

Question Topic	Very Satisfied	Somewhat Satisfied	Not Too Satisfied	Not at All Satisfied
Overall support from Focus on Energy representatives	59%	27%	7%	-
Communication with Focus on Energy representatives	49%	29%	15%	-
Clarity of Program eligibility requirements	39%	49%	10%	2%
The prescriptive incentive application forms	34%	51%	10%	5%
The Focus on Energy website	27%	49%	10%	7%
The time it takes to receive the incentive	27%	37%	17%	7%
The custom incentive application forms[2]	24%	53%	18%	6%
The selection of eligible equipment	24%	56%	15%	2%
Training provided by Focus on Energy	22%	46%	12%	5%
Outreach and marketing materials provided	20%	44%	27%	2%
The incentive amounts	20%	51%	27%	2%
The custom project preapproval process[2]	18%	29%	18%	29%

[1]Percentages may not add up to 100% where Trade Allies did not provide an answer or responded to a question was not applicable to them (n=41 except where otherwise noted).
[2]The Evaluation Team only asked Trade Allies in the custom group (n=17) about the custom process.

Trade Ally Suggestions for Program Improvement

In both the interviews and focus groups, the Evaluation Team asked Trade Allies, "If you could change one thing about Focus on Energy's business programs, what would you change?" Trade Allies provided a range of Program improvement suggestions including:

- Make forms shorter, simplify applications forms, and make the application process easier
- Expand lighting options, provide more options for light-emitting diode (LED) projects, and increase lighting incentives

- Provide incentives for compressed air audits and compact fluorescent lamp (CFL) dimmer switches
- Provide more incentives for liquid propane customers[52]
- Make projects more prescriptive based (instead of custom)
- Let contractors know when Focus on Energy sends the incentive payment to customers
- Allow pending custom projects to move forward while waiting for preapproval

Overall, Trade Allies stated a desire for Focus on Energy to be aware of and consider their needs when making changes. As one Trade Ally said, "make the Focus [on Energy] programs less of a burden on the contractors and consider the contractor's point of view when putting the program together."

Decision-Making

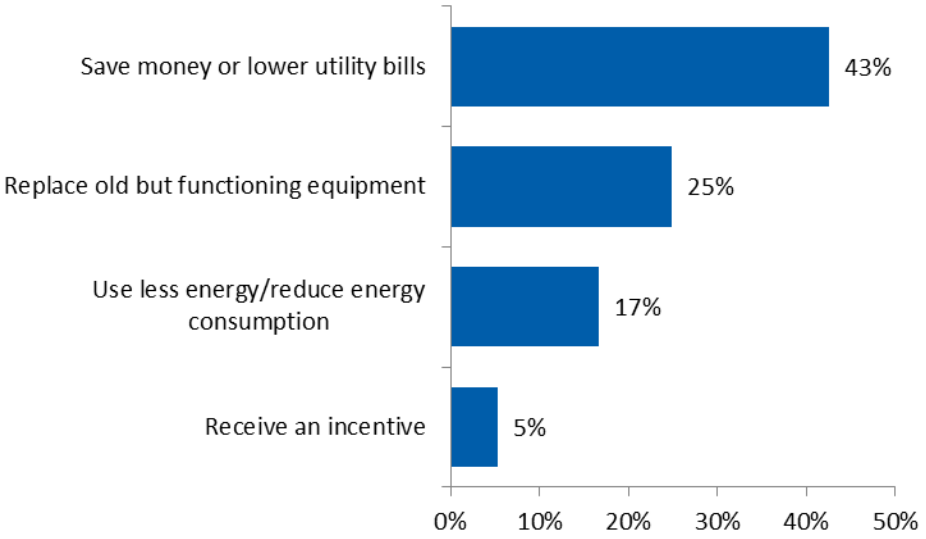
The Evaluation Team asked customers and Trade Allies questions to learn more about their how they make decisions, and what factors influence them in the process. This section describes reasons for participation, which key decision makers influence choices, and perceived benefits to participation. The Evaluation Team also asked customers and Trade Allies about their perceived barriers to participation, and their suggestions for how Focus on Energy can help them overcome these barriers.

Reasons for Participation

Seventy percent of participants surveyed said Focus on Energy incentives influenced their decision to implement projects through Program versus other projects they were considering. Respondents also most frequently said saving money was the most important factor of their company's decision to install the energy-efficiency upgrades, as shown in Figure 132. Replacing old equipment also surfaced as a top reason.

[52] Liquid propane is not an eligible fuel source at this time for Focus on Energy incentives.

Figure 132. Top Four Reasons for Participation



Source: Focus on Energy Business Programs—Business Incentive Program Participant Customer Survey CY 2013
Question C6: "What factor was most important to your company's decision to make these energy-efficient upgrades?" (n=209; multiple responses allowed).

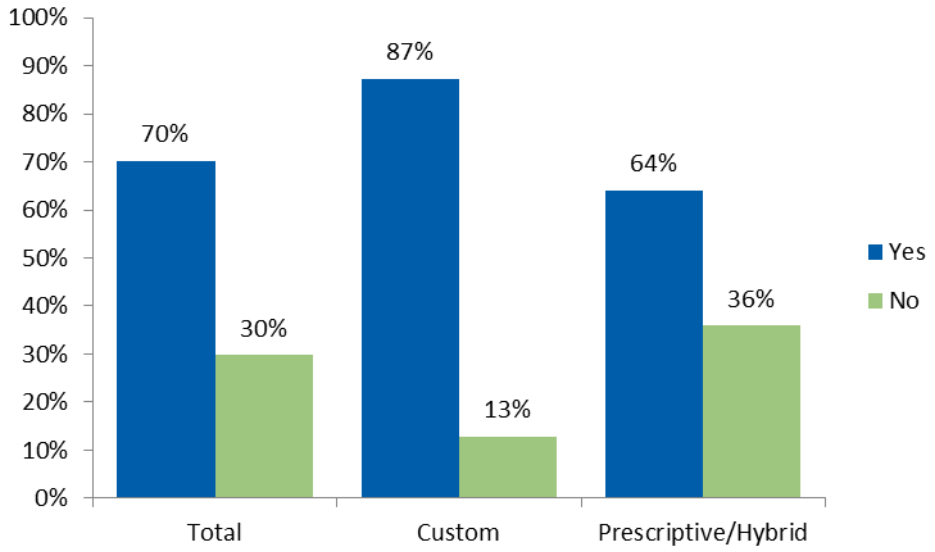
Trade Allies, in focus groups and interviews, echoed customer feedback; they appreciated the Program incentives, which they said encouraged customers to install energy-efficient equipment. Several said that the incentives were an integral part of their marketing and business. From most Trade Allies, offering incentives can increase customers' willingness to upgrade equipment or purchase new higher-end, higher-efficiency equipment.

However, several Trade Allies in northwest Wisconsin did not think these incentives were the most influential factor encouraging customers to install energy-efficient equipment. As one stated, "I don't think it's [the Focus on Energy incentive] necessarily the deciding factor, I don't think the incentive is probably large enough to make [the customer] do [the upgrade]."

Another factor that may influence customer decision making is whether or not customers had an expert facility assessment to determine all the available energy savings opportunities. Facility assessments often help customers make key decisions including the type of project they should pursue and how much they should do to achieve deeper savings.

The Evaluation Team asked survey respondents if anyone walked through their facilities to help them identify energy-efficiency improvements. Overall, 30% of respondents reported that their facilities did not receive an assessment. Customers with custom projects had facility assessments more often than customers with prescriptive or hybrid projects (see Figure 133).

Figure 133. Customer Facility Assessments



Source: Focus on Energy Business Programs—Business Incentive Program Participant Customer Survey CY 2013 Question D1: "Did anyone walk through your facility and conduct an assessment to help identify energy-efficiency improvements?" (n=178 total: custom n=47, prescriptive/hybrid n=131).

Key Decision Makers

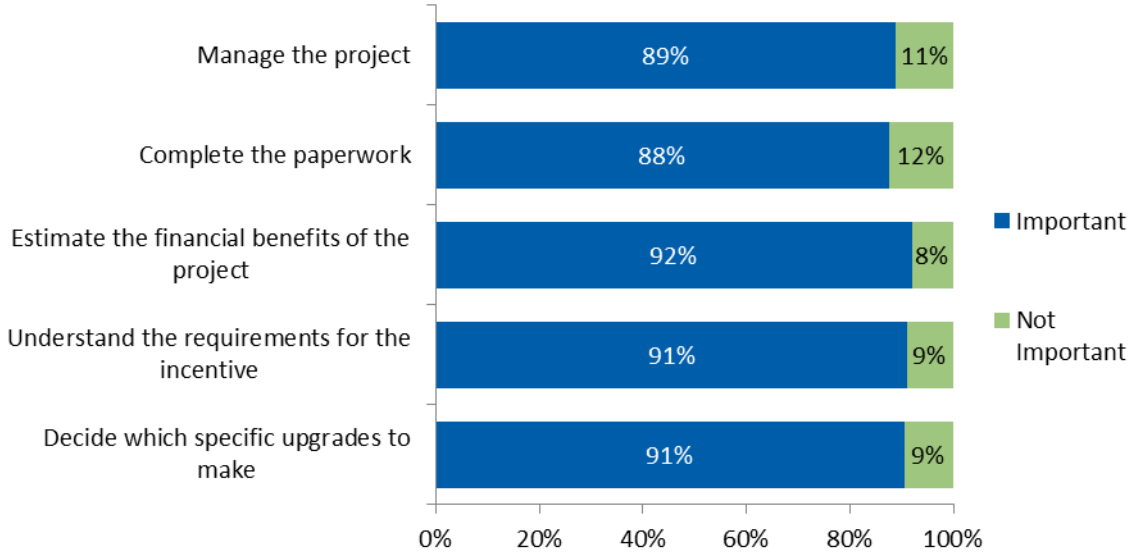
When the Evaluation Team asked participants who had to approve the project for their facility:

- Over half of the respondents said the business owner was the sole person to approve the project.
- A third said the facility manager approved the project.
- Forty-four percent of the respondents said financial managers (16%), corporate or regional executives (14%), or plant managers (13%) approved the project.

Twenty-nine percent of respondents said two or more people had to approve the project, and 10% said three or more people had to approve the project.

Program participants surveyed said contractors also played an important part of their decision-making process, as shown in Figure 134. Most of participating customers (88% to 92%) rated the Trade Allies as "very important" or "somewhat important" in all aspects of the project decision-making process explored in the survey.

Figure 134. Importance of Trade Allies to Participating Customers



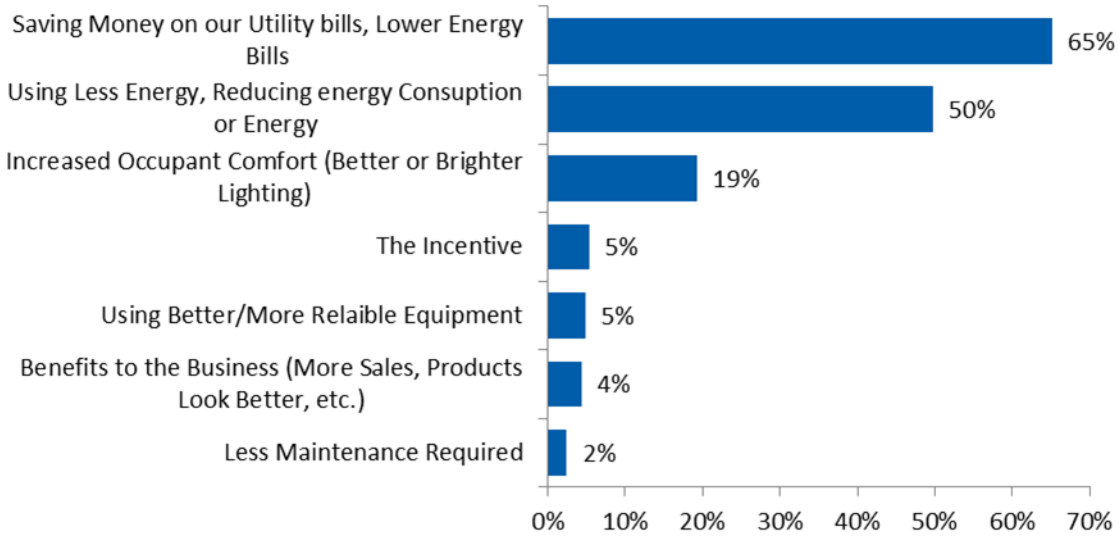
Source: Focus on Energy Business Programs—Business Incentive Program Participant Customer Survey CY 2013 Question D2: "How important was/were the contractor(s) in helping you…" (n≥175).

In focus groups and interviews, Trade Allies indicated that they provided extra customer service as an intentional sales strategy. One Trade Ally said he filled out the incentive paperwork for customers "as a tool to more completely satisfy my existing customers."

Benefits to Participation

When asked what benefits they thought they would receive from participating in the Program (see Figure 135), surveyed participants most often said saving money (55%) and energy (50%), with increased occupant comfort a distant third (19%).

Figure 135. Top Perceived Benefits of Participation



Source: Focus on Energy Business Programs—Business Incentive Program Participant Customer Survey CY 2013
Question C7: "What would you say are the main benefits your company has experienced as a result of the energy-efficiency upgrades we've discussed?" (n=207).

When asked what they like about working with Focus on Energy's business programs, most Trade Allies offered positive feedback about the programs. They said the business programs made energy-efficiency projects financially feasible for customers and encouraged them to complete projects. They also reported that Focus on Energy provided credibility to Trade Allies and that the business programs improved their business, sales, and customer relationships. Trade Allies said the following with regard to the benefits of participation in Focus on Energy business programs:

- "Focus [on Energy] definitely helps my business. I appreciate that very much and that's why I push it as much as I do…it's a win-win situation for Focus [on Energy] and our companies… Without [the programs] being [available] we would all be in a little bit tougher situation."
- "[Focus on Energy's programs] helps our projects move forward."
- "Funding gets [customers] interested, [a] third party gives them confidence."
- "[The programs] help [Trade Allies] sell a product [customers] really need."
- "People [are] finally getting something for doing the right thing."
- "I think [the program is] a great thing for the customer and the business… I believe it makes for very good relationships; it makes it looks like the business is working for the customer."

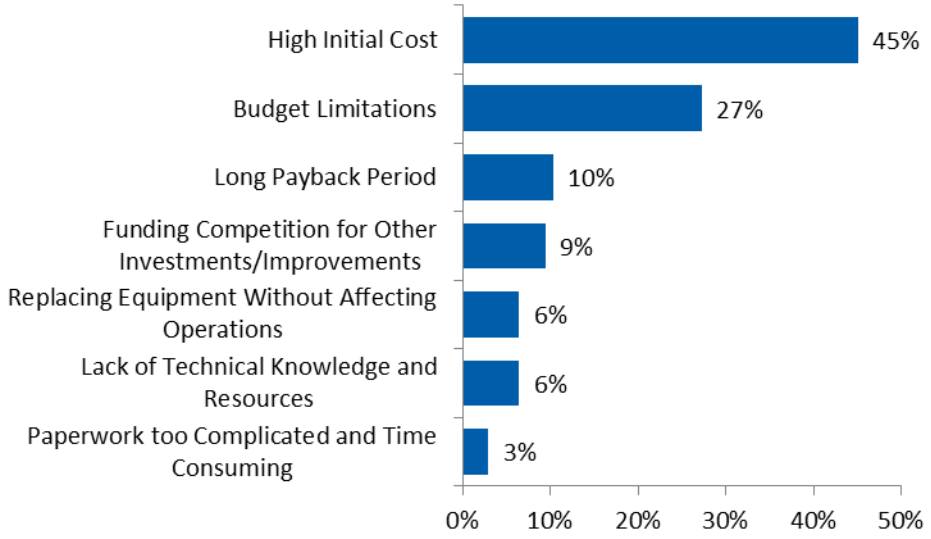
Barriers to Participation

Surveyed participants said the biggest barriers to making energy-efficiency improvements were high initial costs and budget limitations, as shown in Figure 136. Long payback periods and funding competition—both also budgetary concerns—were the next highest reported barriers. Six percent of

respondents also said they wanted to make sure that replacing the equipment would not affect normal operations, and another 6% said they lacked the technical knowledge and resources to understand what they could do at their facilities to save energy.

The Evaluation Team also asked Trade Allies what they thought were the most significant obstacles preventing customers from installing energy-efficiency equipment. The Trade Allies reported similar barriers to installing equipment as customers did—costs, return on investment, long project approval timing, and a need for customer education.

Figure 136. Top Perceived Barriers to Participating in the Business Incentive Program



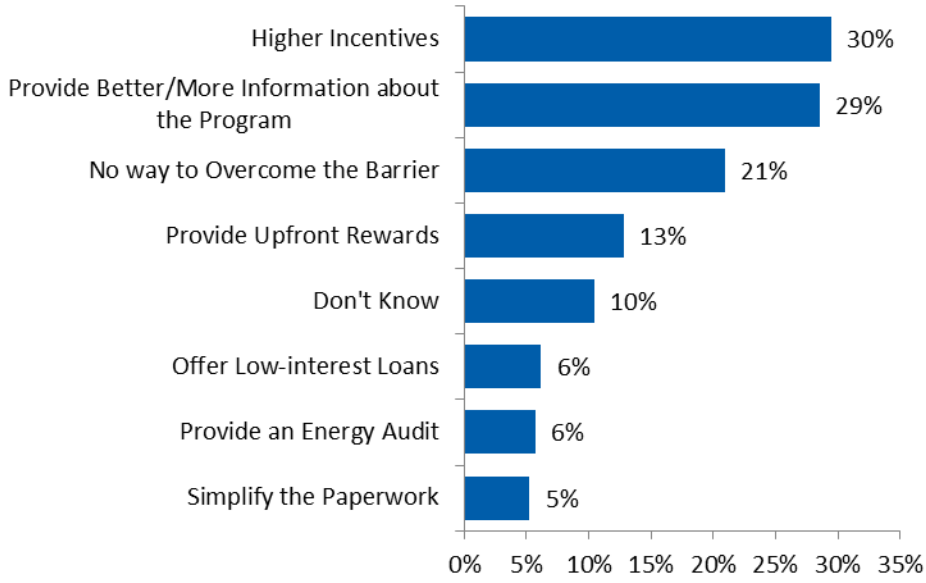
Source: Focus on Energy Business Programs—Business Incentive Program Participant Customer Survey CY 2013 Question E1: "What do you see as the biggest challenges to making energy-efficient improvements inside your company?" (n=202; multiple responses allowed).

Overcoming Barriers to Participation

Similar to CY 2012 survey results, almost a third of the surveyed participants in CY 2013 said higher incentives would help them overcome participation barriers, and another 13% said that providing rewards up front would help. Twenty-nine percent of respondents said that better or more information about the Program would help, and other respondents said they did not know (10%) or that nothing would help them overcome the barriers (21%).

Figure 137 shows what participants said would help them overcome barriers to making energy-efficiency investments.

Figure 137. Top Ways to Overcome Barriers



Source: Focus on Energy Business Programs—Business Incentive Program Participant Customer Survey CY 2013
Question E2: "What could be done to help your company overcome these challenges?"
(n=210; multiple responses allowed).

The Evaluation Team also asked Trade Allies if the incentives were adequate or if specific equipment merited higher incentives. Some Trade Allies, particularly those in the lighting industry, thought that certain prescriptive incentive amounts were too low, specifically for LEDs. Other technologies that Trade Allies mentioned for new incentives, renewed incentives, or increased incentives were the following:

- Mini-split air conditioners
- Heat pumps
- Motors
- Steam trap incentives
- CFL dimmer switches
- Variable-speed displacement equipment
- VFDs
- Digital controls
- Exterior lighting

Key Program Processes

The following sections provide more insights about several of the Program's key processes, including Trade Ally communication and application forms and processing.

Trade Ally Communication

The Evaluation Team asked Trade Allies to describe their experiences communicating with Focus on Energy staff as well as their experiences with the call center. The following section summarizes the Trade Allies responses by topic.

Timing of Communication

Overall, Trade Allies said they did not receive sufficient communication and information from Focus on Energy about program changes. In all four focus groups,[53] Trade Allies reported frustration about frequent Program changes and the lack of communication about these changes. One Trade Ally stated, "They [Focus on Energy] don't tell us anything until two weeks after the Program has changed." Several Trade Allies said they had heard about Program changes from customers, but most preferred to hear about Program changes from Focus on Energy. One Trade Ally said that, "It would be nice to know about the programs before the customer…we need a chance to market or prepare for it."

A few Trade Allies also said that because projects can take a few months to a few years to implement, they need to know about Program changes in advance. One Trade Ally said, "Try to give us some kind of heads up what the changes are going to be so we know not to sell a project that takes two years to get developed."

Further, in all four focus groups Trade Allies discussed how frequent changes in program offerings for incentives and incentive amounts were a challenge. They said that customers can take as long as six months to two or three years to approve larger projects, and Trade Allies do not know what the incentives will be from year to year.

Communication with Focus on Energy Representatives

Many Trade Allies who worked regularly with Focus on Energy representatives had good things to say about the services they received, particularly from Energy Advisors. These Trade Allies said they liked having contact with a knowledgeable representative that informs them of Program changes, walks them through the application process, and helps them submit successful incentive application paperwork. As one Trade Ally stated, "The [Energy]Advisors are your [Trade Allies'] trainers." However, a few Trade Allies said that Focus on Energy staff had varying levels of knowledge; a Trade Ally from northwestern Wisconsin said that although the local representatives were helpful, those from Madison were not as helpful or knowledgeable.

However, not all Trade Allies had direct contact with Focus on Energy representatives. These Trade Allies described how the reassignment of Energy Advisors disrupted the relationships they had previously

[53] Trade Ally focus groups included Trade Allies who worked on the Business Incentive, Chain Stores and Franchises, and Large Energy Users Programs. The Evaluation Team placed greater attention in focus groups on the Business Incentive Program than for the other programs because Trade Allies played a lead role in serving customers in this Program, whereas Trade Allies collaborated more with Energy Advisors in the other two programs.

built. After the Implementer reassigned Energy Advisors were reassigned, Trade Allies either did not know who to contact or experienced less frequent contact with their new Energy Advisors. One Trade Ally remarked, "I don't ever hear from Focus [on Energy]. Never. I used to have someone come in years ago and I haven't seen anyone since."

Trade Allies also reported difficulty with:

- Finding contact information for Energy Advisors serving their area
- Determining who to contact across programs and sectors
- Determining who to contact in different parts of the state

Trade Allies expressed a preference for communication via in-person meetings, e-mail, and phone, though most do not want to be routed to voicemail. According to one Trade Ally, "nothing [is] worse than getting a recording." Trade Allies were interested in receiving e-mails, but a few expressed a desire for more direct e-mail content. One Trade Ally said, "I just delete it [the e-mail] right away as soon as I see [it's from] Focus on Energy… kind of turned me [off]… they should have a brief description of what's new and then that's it and a link after that." A few Trade Allies also requested a single point of contact at Focus on Energy to answer questions.

Trade Ally Call Center Experience

Trade Allies can contact the Program through two call centers. A general Focus on Energy call center that the Administrator operates refers calls to a second Program-specific call center that the Implementer operates. Since Trade Allies were not likely to have been aware of this distinction, the focus groups referred to the call center experience in general. When the Evaluation Team asked Trade Allies about their experiences with the call center, responses varied. Although quite a few Trade Allies in other parts of the state had used the call center, the majority of Trade Allies in northwest Wisconsin had never used it. In addition, some Trade Allies described having simple and easy interactions with the call center staff; but others experienced problems, including a few who described it as a "waste of time." The problems Trade Allies reported with the call center included:

- Being unable to get the information they needed
- Frequently being routed to voicemail
- Not receiving timely responses, or any response, after leaving voice messages

Most Trade Allies preferred having direct access to an Energy Advisor. As one Trade Ally said, "It's good to have the right person's phone number."

Application Forms and Review Processes

In CY 2012, the Evaluation Team concluded that the length of time to preapprove projects and process incentive applications resulted in low satisfaction among customers and Trade Allies. Although the Program Administrator and Program Implementer made several changes to reduce the length of time to process applications during CY 2013, the Evaluation Team found these processes continued to be a

source of frustration to the Program staff, participants, and Trade Allies. In addition, Trade Allies also expressed concerns about the uncertainty of the actual incentive amounts for custom projects.

In addition to the findings presented here, Appendix R provides more detail about the Business Incentive Program application process and a comparative review of processes implemented among similar programs.

Application Forms

First, it is important to note that Trade Allies play a significant role in completing the application forms for customers. Over half of customer survey respondents (n=177) said the Trade Ally was very important in helping them complete their paperwork. When asked who filled out the paperwork, less than 40% of the respondents (n=178) said they did it without Trade Ally assistance.

Focus on Energy introduced changes to streamline and improve project application forms in CY 2013. The Evaluation Team's December 2013 review of the forms showed there were 24 different application forms available for Program projects. Ten of those forms were portable document format (PDF) fill-in forms that users could save but not submit online since the Program website did not have an application submission option.

As in CY 2012, both Trade Allies and customers reported frustration with the application forms in CY 2013. Just over a third (14 out of 41) of the Trade Allies participating in the focus groups and interviews said they were "very satisfied" with application forms for prescriptive projects, and only 18% of Trade Allies said they were "very satisfied" with the forms for custom projects. About half of Trade Allies said they were "somewhat satisfied" with the application forms for custom and prescriptive projects.

When asked about suggested improvements to Focus on Energy programs, Trade Allies suggested simplifying the application forms and making them shorter, identifying four areas of concern:

- Application forms request excessive information they do not see as relevant.
- Application forms request redundant information (particularly invoice information).
- Lengthy application forms require too much of their time to complete.
- Frequent changes in the Program and forms were confusing; they did not know which forms to use.

Application Review Process

In addition to getting input about the application forms, the Evaluation Team also gathered feedback from Program staff, participants, and Trade Allies about the application review process. The Evaluation Team also analyzed participant data in SPECTRUM to assess how long application processing takes according to the tracking system.

Similar to CY 2012 evaluation findings, the Administrator and Implementer staff said that the review process was too lengthy and affected Trade Ally and customer satisfaction.

Trade Allies in focus groups said that the preapproval timeline took from a few days to several months. They reported that customers were often on tight deadlines to begin and complete projects and would cancel projects if their deadlines passed before the project received preapproval.

Trade Allies also estimated the time to receive incentive payments ranged from three to 14 weeks, with one Trade Ally reporting a check for a prescriptive project took five or six months to arrive. Trade Allies said six to eight weeks was acceptable to process a payment, but they were frustrated when Focus on Energy contacted them for additional information or to correct errors after this amount of time.

Despite improved customer satisfaction with the review process from CY 2012 to CY 2013 (a 25% increase in "very satisfied" ratings), there is still room for improvement. One-third of customers reported they were "somewhat satisfied" or "not satisfied" with the application process. These survey respondents said the process was too long, too complex, a lot of paperwork, and required a lot of redundant information.

More specifically, customers who completed custom projects reported the preapproval process was delayed, took too long to complete, required duplication of paper work when the representatives changed, and that they did not understand the overall process. Nearly half of the Trade Allies who worked with custom projects said they were "not too satisfied" or "not at all satisfied" with the custom project preapproval process.

The Evaluation Team analyzed the data in SPECTRUM to determine how long it took to process applications for the Program.[54] As shown in Figure 138, most projects with preapproval took about two to four weeks to issue the incentive agreement. Incentive payments took about four to six weeks (a one week improvement in the median incentive processing time from CY 2012).

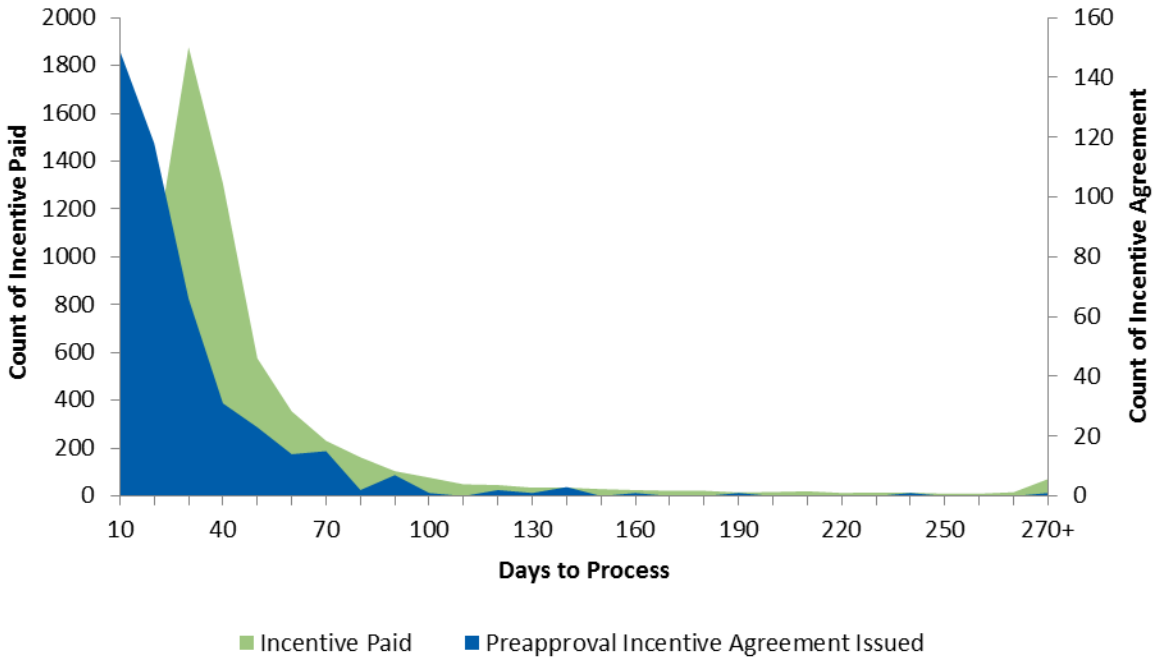
[54] The Evaluation Team calculated processing times as follows:

Preapproval Incentive Agreement: Difference between the date the Program Implementer entered the measure into SPECTRUM (Measure Created Date) and the date the Program Implementer mailed the incentive agreement (Incentive Agreement Mailed Date).

Incentive Payment: Difference between the date the Program Implementer entered the measure into SPECTRUM (Measure Created Date) and the date the Program Implementer changed the status of the project in SPECTRUM to "paid" (Date of Status Change to Paid).

This analysis does not factor in the time it took for project intake, which occurred before a project was entered into SPECTRUM.

Figure 138. Business Incentive Processing Times for Project Preapproval and Incentive Payments



Although SPECTRUM shows that most projects took a couple months to process, there were some projects that took much longer. Although these longer processing times represent the minority of situations, feedback from Trade Allies and customers indicate that their perceptions about the Program may still be largely driven by projects that took longer to process.

There are a number of possibilities for why delays in processing times occurred, and the Evaluation Team does not have enough detailed information from the data entered in SPECTRUM to analyze how much the Implementer, customers, or Trade Allies may have contributed to delays. However, these findings from process interviews with Implementer staff provide insights from their perspective.

Implementer staff said the main challenge with the application review process (causing long processing times) was that customers and Trade Allies often submitted incomplete application packages. Thus, it required a lot of back-and-forth communications and time to complete the applications. Implementer staff said this happened on 50% to 60% of applications. Implementer staff also described difficulty obtaining the required information when communicating with only one party—either the Trade Ally or customer. According to the Program Implementer, Trade Allies may not be able to provide accurate customer and facility operations, and customers find it difficult to provide accurate and complete equipment specifications. On the other hand, customers and Trade Allies both reported frustration with the number of follow-up calls received from Focus on Energy to obtain missing information they believed they had already provided.

When asked if there were enough staff for application processing, the Program Implementer said that things ran more smoothly toward the end of CY 2013 when all of its staff were dedicated to application

processing. The Program Implementer reported it was more challenging to process applications quickly during other times of the year when staff members had other duties. According to the Program Implementer, the average number of applications received per week in CY 2013 was 111 but increased to 278 applications per week during high-volume weeks. [55] The time required to process each application varied according to the project and measure complexity.

Changes to Application Review Processes

The Program Implementer said they made some changes in CY 2013 to improve the process (including developing internal performance metrics previously discussed in the Program Design, History, and Goals section):

- **Improved Payment Approval Process:** The Program Implementer worked with the Program Administrator to determine what the QA/QC process for payment approval entailed and assigned specific duties to individuals reviewing applications.
- **Transitioned Application Processing In-House:** At the beginning of Q4 of CY 2013, the Program Implementer took over all application review and processing responsibilities that a subcontractor had previously handled.
- **Increased Engineering Staff:** For projects over $5,000, the Program Implementer increased the QA/QC technical review from one engineer to a team of engineers and also hired a new full-time engineer to help streamline workflow.

Implementer staff reported these changes reduced the average number of days to process applications for payment and said it may be possible to reduce it further.

During the focus groups, Trade Allies suggested several additional application process changes. One Trade Ally suggested assigning registered contractors a number to use on application forms in place of filling out their name and contact information.[56] Another Trade Ally suggested a "fast-track process" that allows highly active Trade Allies who have proven their competency to bypass "some bureaucracy" such as lengthy custom application reviews. Trade Allies also suggested providing online application submission and streamlining application processes and incentive offerings.

Incentives for Custom Projects

Several Trade Allies in the custom focus group mentioned concerns about the uncertainty of the actual incentive amounts for custom projects. A few said that their customers were wary of custom incentives. These Trade Allies said they were sometimes unable to include custom incentives in their bids because customers were worried they might not receive the incentive or might receive a lower incentive than anticipated.

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[55] This information is from the December Monthly Performance Report from CB&I.

[56] The Program Administrator announced planned changes to the online application process in late CY 2013 that will enable Trade Allies to automatically populate some entries in the application forms.

One Trade Ally in the custom group reported that a Focus on Energy representative had completed the incentive paperwork for one of his customers. When the Program Implementer conducted an audit on the completed project, the auditor discovered that the Focus on Energy representative had not correctly recorded the facility's hours of operation. As a result, the final incentive was approximately $10,000 less than the original estimate. Since this Trade Ally had included the Focus on Energy incentive as part of his bid, the customer withheld $10,000 from the Trade Ally's payment.

Program Cost-Effectiveness

Evaluators commonly use cost-effectiveness tests to compare the benefits and costs of a demand-side management program. The benefit/cost (B/C) test used in Wisconsin is a modified version of the total resource cost (TRC) test. Appendix I includes a description of the TRC test.

Table 123 lists the CY 2012-2013 incentive costs for the Business Incentive Program.

Table 167. Business Incentive Program Incentive Costs

	CY 2013	CY 2012-2013
Incentive Costs	$ 12,318,989	$ 19,619,393

The Evaluation Team found the CY 2013 Program to be cost-effective (a TRC benefit/cost ratio above 1). Table 124 lists the evaluated costs and benefits.

Table 168. Business Incentive Program Costs and Benefits

Cost and Benefit Category	CY 2013	CY 2012
Costs		
Administration Costs	$1,442,145	$1,188,424
Delivery Costs	$5,888,878	$4,852,830.77
Incremental Measure Costs	$51,108,316	$33,808,457
Total Non-Incentive Costs	$58,439,338	$39,849,711
Benefits		
Electric Benefits	$87,789,590	$62,891,729
Gas Benefits	$46,560,080	$23,806,769
Emissions Benefits	$40,403,913	$27,483,017
Total TRC Benefits	$174,753,583	$114,181,515
Net TRC Benefits	**$116,314,245**	**$74,331,803**
TRC B/C Ratio	**2.99**	**2.87**

Evaluation Outcomes and Recommendations

The Program successfully met life-cycle energy savings goals in CY 2013 at a lower cost than planned, which primarily resulted from lower incentive payments than expected for the savings achieved. In addition, participants surveyed rated their satisfaction with the Program overall and most Program elements significantly higher than in CY 2012.

The Evaluation Team identified the following opportunities to further improve the Program in CY 2014.

Process Outcomes and Recommendations

Outcome 1. Energy Advisors are integral to effective management of and communication with Trade Allies.

However, Energy Advisors reported they were spread too thin, and Trade Allies reported they did not get the support they needed. As a result, Trade Allies often did not hear about Program changes or special incentive offerings and were not available to help make the application process efficient for customers.

Recommendation 1. Increase Program resources to better manage and communicate with Trade Allies. The Program Implementer needs more resources so that it can lower the number of Trade Allies that each Energy Advisor is responsible for managing and supporting. The Program Administrator may also need additional staff resources to manage and support the Trade Ally network.

Outcome 2. Complicated and long turnaround times for a small proportion of projects could potentially damage the Program's reputation over time and affect participation.

Although the Evaluation Team's analysis of SPECTRUMshows that most projects took between two to four weeks to issue the incentive agreement, and between four and six weeks to issue the incentive payment, there were some projects that took much longer (see Figure 138 on page 324 for a distribution of Program processing times).[57] Although these longer processing times represent the minority of situations, feedback from Trade Allies and customers indicate these projects affect their perceptions.

Additional improvements are in development or planned, but findings showed these areas of concern:

- Trade Allies and customers remain frustrated with the length and complexity of the application forms.
- Applications submitted with incomplete information are a common cause of processing delays.
- The number of reviewers at some incentive levels may be excessive for the level of risk.
- The workflow routing in SPECTRUM does not match current practices, nor allow flexibility to shift resources to support peak volume processing periods.

Recommendation 2. Improve the application process as follows:

- **Communicate with Trade Allies and customers about application and approval process improvements and use performance metrics to demonstrate progress.** Carefully track ongoing progress against performance metrics and continue to communicate about successes. Provide training to Trade Allies and customers about the process and offer solutions to common issues. Work with an advisory committee including Trade Allies and Energy Advisors to further improve the forms—for instance, reduce redundancy by providing auto-fill forms and publicize changes.
- **Determine if Focus on Energy can accelerate its transition to an online application system.** Focus on Energy made previous announcements that it intended to develop online forms and registration options that automatically populate applications with applicant information, yet this transition was in process during CY 2013 and had not been fully executed for all application types. An online application system appears to offer the most benefits in making it easier for applicants to prepare and submit applications. With data-entry validation and checklists for

[57] The Evaluation Team calculated processing times as follows:

- Preapproval Incentive Agreement: Difference between the date the Program Implementer entered the measure into SPECTRUM (Measure Created Date) and the date the Program Implementer mailed the incentive agreement (Incentive Agreement Mailed Date).
- Incentive Payment: Difference between the date the Program Implementer entered the measure into SPECTRUM (Measure Created Date) and the date the Program Implementer changed the status of the project in SPECTRUM to "paid" (Date of Status Change to Paid).

This analysis does not factor in the time it took for project intake, which occurred before a project was entered into SPECTRUM.

attachments incorporated, an online system could also alleviate or reduce the problems Focus on Energy currently experiences with incomplete applications that require follow up and consume staff time.

- **Develop strategies to achieve the desired level of confidence and risk management in fewer steps.** Revisit the objectives of each step in the review process to determine the purpose of each level of review, and then assess opportunities to improve.

Appendix R provides additional details about how Focus on Energy could improve its application review process.

Outcome 3. The Program, in shifting away from custom projects, may be missing opportunities for deeper savings.

According to the 2013 Work Plan, one of the key goals of the Focus on Energy programs in CY 2013 was to drive deeper, cost-effective energy savings. However, the Evaluation Team's analysis of CY 2012 and CY 2013 SPECTRUM data suggest the shift toward more prescriptive projects may counter its goal of deep savings. The analysis revealed the following:

- **Custom projects provided significantly more savings per project (78% more average savings per project than the prescriptive projects).** Although the custom process may take more effort, savings appear to be larger and deeper.
- **Customers with custom projects more often get facility assessments, which may increase opportunities for deeper energy savings.** Facility assessments can significantly increase customer awareness of energy saving opportunities and help them decide how to treat their whole building, instead of just one piece of equipment. Custom projects received facility assessments much more often than customers with prescriptive/hybrid projects.
- **Prescriptive customers frequently install only one measure type per project, as opposed to multiple measure types per project.** Although the total number of projects and savings increased from CY 2012 to CY 2013, on average, customers installed 10% fewer projects with more than one measure type in CY 2013 than in CY 2012. Specifically, prescriptive projects with more than one measure type declined 14%, while custom and hybrid projects stayed about the same.

Recommendation 3. Make the custom process and incentives more attractive for participants to encourage deeper savings. Work with an advisory committee (including Trade Allies and customers) to explore what options would encourage them to do more custom projects. Consider piloting a different incentive structure (such as tiered incentives or bonuses) to encourage customers to install projects with higher potential for deeper energy savings and to avoid cream skimming and lost opportunities. Streamline application and review processes wherever possible and improve understanding and expectations about the cycle time needed for custom projects. Emphasize the benefits of custom projects to customers and Trade Allies.

Impact Outcomes and Recommendations

The Evaluation Team organized its outcomes and recommendations into two categories: (1) essential for Focus on Energy to improve its energy savings calculations; and (2) additional areas for improvement that would be useful for evaluation purposes but is not essential to have for every project.

Essential Outcomes and Recommendations

Outcome 1. Compressed air technologies application form does not accommodate the scenario of a single VFD compressor replacing two smaller baseline compressor systems.

It is very important to gather the load profile for each baseline unit as it can have a dramatic effect on project savings.

Recommendation 1. Reformat the application so that a load profile for each replaced baseline compressor can be entered.

Outcome 2. Manually-controlled compressed air heat recovery systems should not be allowed by the Program due to concerns about persistence of savings.

The Evaluation Team observed manually-controlled air intake or discharge louvers, used to control the flow of heated air from the compressor equipment rooms, during multiple on-site inspections.

Recommendation 2. Require heat recovery systems be controlled by a room thermostat or other automated means.

Outcome 3. Work papers for several compressed air measures understate operating hours.

Associated measures were cycling thermal mass air dryers, no-loss drains, and pressure flow controllers.

Recommendation 3. Revise the deemed savings methodologies for compressed air measures to include operating hours.

Outcome 4. Deemed load profiles used for VFD HVAC fan projects are conservative.

The default load profile assumes an average load of approximately 54%. As shown in Table 169, The actual average load determined from metering and customer interviews was approximately 40%.

Table 169. VFD HVAC Fan Load Shape

% Load	Deemed (% Run-Hours)	Evaluated (% Run-Hours)
100%	-	-
90%	5%	0.3%
80%	-	2.5%
70%	25%	8.5%
60%	-	8.2%
50%	40%	13.1%
40%	30%	32.8%
30%	-	6.2%
20%	-	28.3%

Table 170 shows the deemed and evaluated average run-hours per year, average load, and effective full load hours for the VFD HVAC projects evaluated in CY 2013.

Table 170. VFD HVAC Fan Load Profile Comparison

VFD Application	VFD Application			VFD Application			Change in EFLH
	Run-Hours	Load	EFLH	Run-Hours	Load	EFLH	
VFD, HVAC Fan	5,224	54.0%	2,821	4,437	40.4%	1,791	(2,409)

Recommendation 4. In the interest of refining savings estimates for VFD fan projects, ask customers to provide an anticipated load profile in the VFD application form. This could improve the accuracy of projected savings and possibly result in greater claimed savings.

Additional Opportunities for Improvement

The Evaluation Team identified the following outcomes and recommendations that would be useful for evaluation purposes but is not essential to have for every project.

Outcome 5. The compressed air technologies application form requires that submitted Compressed Air and Gas Institute (CAGI) data sheets be included for 100-pounts per square inch (psi)-rated VFD air compressors even if the applicant may be purchasing a unit with a different pressure rating.

This requirement can lead to the use of incorrect maximum flow and input power values in the stipulated savings calculations.

Recommendation 5. Revise the compressed air technologies application form to state that applicants should submit a CAGI data sheet matching the new unit's performance characteristics.

Outcome 6. No air-loss condensate drains are difficult to identify on invoices and are difficult to locate on-site.

Recommendation 6. Revise the compressed air technologies application form to require specification sheets for new drains or for the air dryer if the drain is implicit to the unit itself. Also request the proposed installation location on the application form to make the location easier to identify.

Outcome 7. Determining the necessary parameter values for certain measures is often difficult without documentation from the applicant or contractor.

There is currently no requirement for the applicant or contractor to submit specification sheets or other documentation when applying for no air-loss condensate drains, cycling refrigerated air dryers, and air mist eliminator measures.

Recommendation 7. Require applicants to include specification sheets with the application form for no air-loss condensate drains, cycling refrigerated air dryers, and air mist eliminators to enable more accurate determination of savings.

Outcome 8. Savings for pressure/flow controller projects is often difficult to determine.

The Evaluation Team observed errors in deemed savings values credited to many of these projects. The amount of load reduction experienced by a compressor due to a flow controller installation is very specific to the application and more data should be required from contractors installing these systems.

Recommendation 8. Review savings methodology for these projects and establish a uniform approach. Require applicants to submit performance and capacity specifications for the affected air compressor with the pressure/flow controller application form.

Outcome 9. Many boiler retrofit projects are complex and include new controls resulting in uncertain savings.

The preferred approach for determining the savings for boiler retrofit projects is billing analysis (IPMVP Option C). This method requires a minimum of one year of both pre- and post-retrofit billing data.

Recommendation 9. Use IPMVP Option C to determine the savings for a sample of boiler retrofit projects in order to validate the current deemed savings approach.

Outcome 10. Determining savings for the 10:1 high-turn-down burner measure is uncertain.

The few existing studies of this measure are inconclusive or contradictory.

Recommendation 10. Re-evaluate the 10:1 high-turn-down burner measure. Perform an evaluation study specific to this measure, particularly if the measure is commonly implemented without a boiler replacement.

Outcome 11. Determining the savings for the tune-up of unit heaters and rooftop units is uncertain and many of the evaluated projects appear to be freeriders.[58]

Tune-ups are often a routine annual or semi-annual maintenance activity.

Recommendation 11. No recommendation because Focus on Energy discontinued this measure for CY 2014.

[58] Focus on Energy is discontinuing HVAC Tune-Up incentives in CY 2014.

Chain Stores and Franchises Program

The Chain Stores and Franchises Program (the Program) offers financial incentives to retail, food sales, and food service businesses that have at least five locations in Wisconsin. Key Program actors are the Program Administrator, Program Implementer (Franklin Energy), Trade Allies, and National Rebate Administrators.

The Program offers both custom and prescriptive incentive paths and allows participants to consolidate projects at multiple locations on one application. The Program also offers a direct install option, through which Implementer staff install a limited set of measures at no cost to the customer.

Table 171 presents a summary of the Program's actual spending, savings, participation, and cost-effectiveness. [59]

Table 171. Chain Stores and Franchises Program Actuals Summary

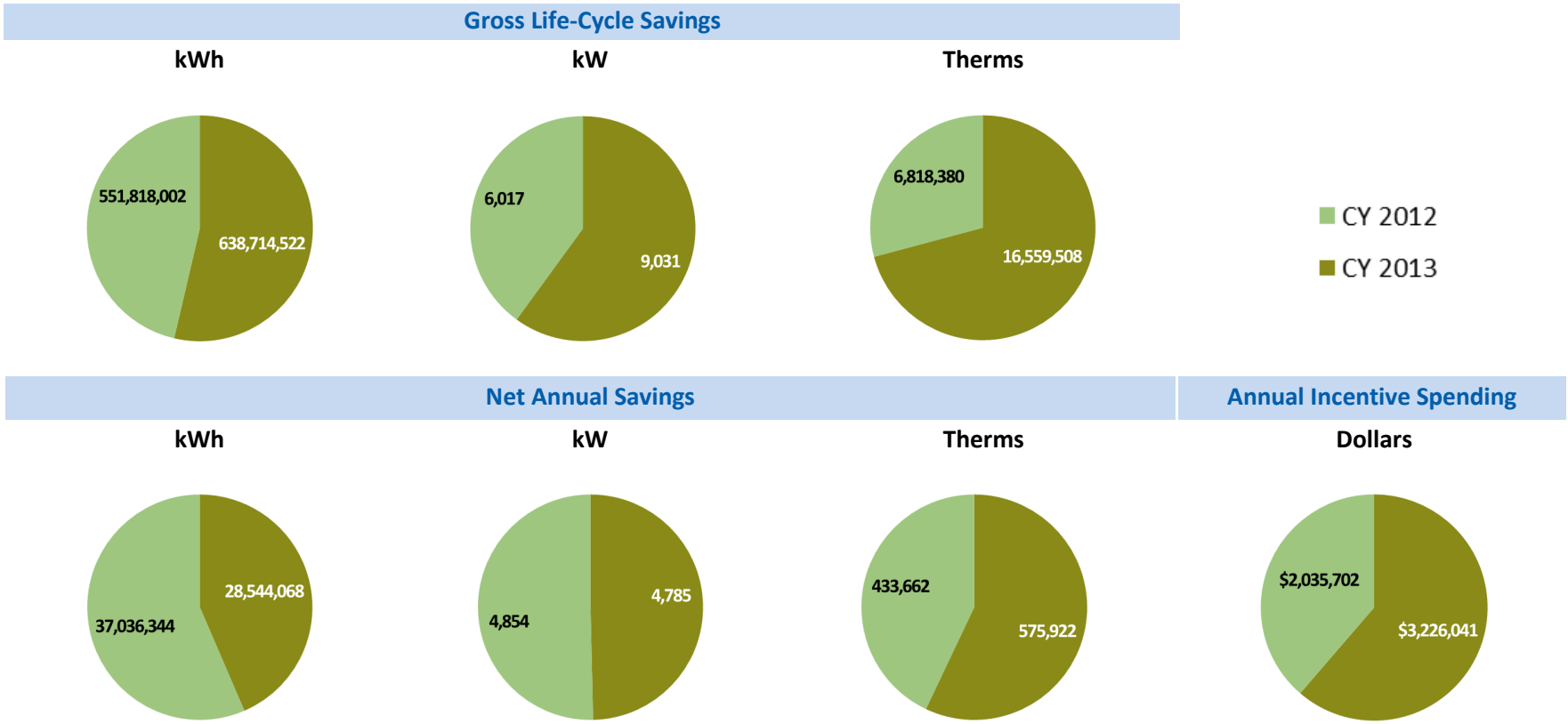
Item	Units	CY 2013 Actual Amount	CY 2012-2013 Actual Amount
Incentive Spending	$	$ 3,226,041	$ 5,261,743
Verified Gross Life-Cycle Savings	kWh	638,714,522	1,190,532,524
	kW	9,031	15,048
	therms	16,559,508	23,377,888
Net Annual Savings	kWh	28,544,068	63,502,328
	kW	4,765	9,322
	therms	575,922	1,000,092
Participation	Unique Customers	502	725
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	4.38	2.09 [1]

[1] The cost-effectiveness ratio is for CY 2012 only.

[59] This table presents gross life-cycle savings to allow comparison with Focus on Energy's quadrennial gross life-cycle savings target, and net annual savings to allow assessment of the Program Administrator and Program Implementer's achievement of net annual savings.

Figure 13 shows a summary of savings and spending in CY 2012 and CY 2013. The Program launched in April 2012 and therefore was active for nine months in CY 2012.

Figure 139. Chain Stores and Franchises Four-Year (CY 2011-2014) Savings and Budget Progress



Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted impact and process evaluations for CY 2013. These were the key questions that directed the Evaluation Team's design of the EM&V approach:

- What are the verified gross and net electric and gas savings?
- How effective and efficient are the Program's operations?
- How can the Program's delivery processes cost-effectively increase its energy and demand savings?
- How effective are the Program's marketing, outreach, and communication efforts in reaching targeted customers and influencers?
- What are the barriers to increased customer participation, and how effectively is the Program overcoming these barriers?
- How satisfied are customers, Trade Allies, and National Rebate Administrators with the Program, and how have satisfaction levels changed since CY 2012?
- Is the Program meeting cost-effectiveness requirements?
- How can Focus on Energy improve Program performance?

The Evaluation Team designed its EM&V approach to integrate multiple perspectives in assessing Program performance. Table 172 lists the specific data collection activities and samples sizes used to evaluate the Program.

Table 172. Chain Stores and Franchises Program Data Collection Activities and Sample Sizes

Activity	CY 2013 Sample Size (n)	CY 2011-2013 Sample Size (n)
Impact		
On-Site Measurement and Verification	41	73
Project Audit Only	29	60
Process		
Stakeholder Interviews	8	16
Customer Surveys: Complete and Partial Participants[1]	60	110
Participant Trade Ally Interviews	11	25
Nonparticipant Trade Ally Interviews	-	27
National Rebate Administrators	3	3

[1] The Evaluation Team defined complete participants as having completed a Program project in the calendar year evaluated and partial participants as having begun but not completed a Program project in the calendar year evaluated.

Data Collection Activities

Impact Evaluation

For the impact evaluation, the Evaluation Team conducted a combination of project desk audits and on-site inspections. The Evaluation Team selected a random sample of projects for audit; on-site measurement and verification activities focused on measure groups that both contributed large amounts of savings to the Program and also represented sources of uncertainty. Table 173 lists gross savings contributions by measure group, and Table 174 lists the sample sizes for each evaluation activity by measure group.

Table 173. Chain Stores and Franchises Program Gross Savings Contribution by Measure Group

Measure Group	Percentage of Savings		
	kWh	kW	Therms
Agriculture[1]	1%	-	-
Boilers and Burners	-	-	3%
Compressed Air, Vacuum Pumps	1%	-	-
Domestic Hot Water	2%	3%	8%
Food Service	-	-	3%
HVAC	14%	31%	80%
Lighting	56%	47%	-
Refrigeration	28%	18%	6%[2]
Total[1]	**100%**	**100%**	**100%**

[1]Represents a food service new construction project that had a variety of custom measures, including one custom VFD project with measures that SPECTRUM classifies as agriculture-related.

[2]Line items may not sum to 100% due to rounding.

[3]Includes two heat recovery measures with therm savings.

Table 174. Chain Stores and Franchises Program Evaluation Activity Sample Sizes by Measure Group

Measure Group	Project Audit	Project Audit and On-Site Inspection
Lighting	11	20
Refrigeration	3	4
Domestic Hot Water	15	17

Project Audits

Project audits consisted of a detailed review of all relevant documentation available through SPECTRUM (the Program database), including:

- Project applications
- Savings worksheets

- Savings calculations performed by participants or third-party contractors (if applicable)
- Energy audits or feasibility studies
- Customer meter data
- Invoices for equipment or contracting services
- Any other documentation submitted to Focus on Energy

As part of the project audits, the Evaluation Team conducted participant surveys consisting of e-mails and follow-up phone conversations to collect information not available in SPECTRUM. The Evaluation Team conducted audits on projects that had either undergone a desk review or on-site inspection.

The Evaluation Team developed measure- and category-specific survey forms to facilitate data collection. Each survey form included key parameters, procedural guidelines for the on-site inspectors, and survey questions pertaining to eligibility, facility operations, and general building information. In addition, the forms typically included the savings algorithms used to determine Program gross savings. The Evaluation Team used these data collection forms for desk-review and on-site inspection projects.

On-Site Inspections

On-site inspections enable the Evaluation Team to verify energy impacts as well as gather critical data on Program delivery issues such as savings input assumptions and the discrepancies between reported and verified savings. As part of this evaluation, the Evaluation Team identified and compiled key parameters for all evaluated measures and compared the actual values, determined from on-site inspections and customer interviews, with the assumed values used to estimate Program savings.

Process Evaluation

For the process evaluation, the Evaluation Team selected interview and survey subjects to cover the widest possible range of Program experiences.

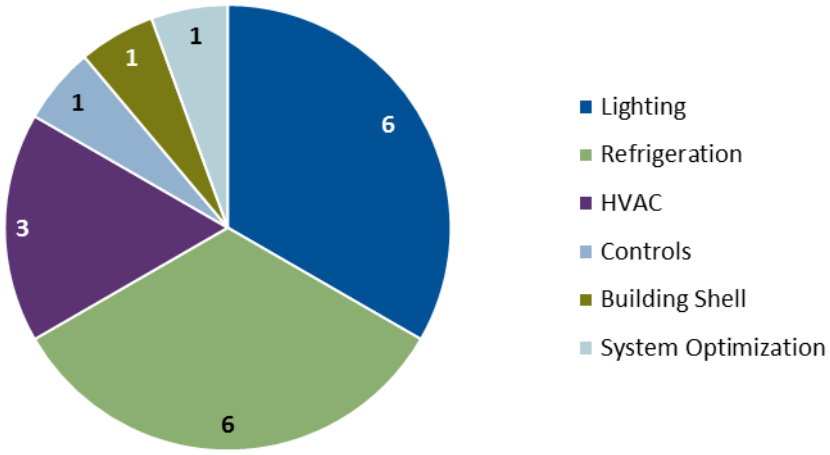
Administrator and Implementer Interviews

The Evaluation Team interviewed eight key Program managers and contributors among the Administrator's and Implementer's staffs.

Trade Ally Interviews

The Evaluation Team interviewed 11 of Focus on Energy's 1,120 nonresidential registered Trade Allies about their Program experiences. Figure 140 shows the distribution of the respondents' technical specialties. All the interviewed Trade Allies ranked in the Program's top 30 electric end-use Trade Allies or top 10 gas end-use Trade Allies by total Program energy savings in CY 2013.

Figure 140. Trade Allies by Specialty



Source: Q2. "What type of energy-efficient equipment or services do you provide your customers?" (n=11; multiple answers allowed)

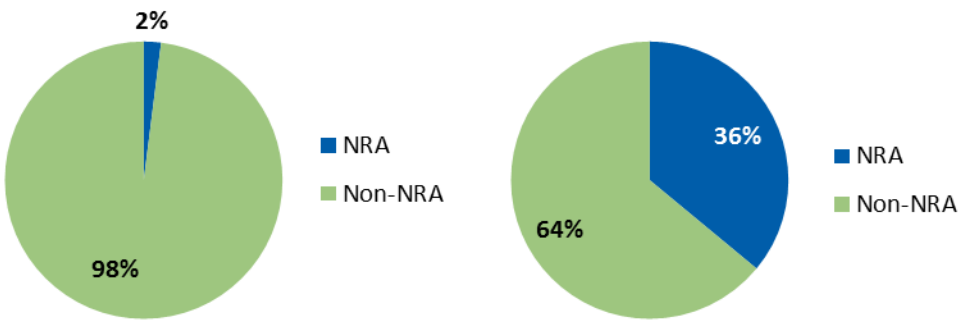
National Rebate Administrator Interviews

The Evaluation Team interviewed all three of the third-party rebate aggregation and management companies that operate on a national basis, collectively known as the National Rebate Administrators. National Rebate Administrators are important to the Program because their clients, though few in number, can operate dozens or hundreds of locations in Wisconsin and represent considerable energy savings potential.

National Rebate Administrators' clients were an important contributor to the Program's energy savings in CY 2013. Database analysis revealed that in CY 2013, at least 11 companies (2% of participants) used a National Rebate Administrator to manage a Program project. As Figure 141 shows, savings from these 11 companies' projects accounted for 36% of the Program's total life-cycle kWh savings.[60]

[60] As of October 2013.

Figure 141. Customers Who Used National Rebate Administrators, by Number and Energy Savings[61]



Note: "NRA" denotes customers who used National Rebate Administrators;
"Non-NRA" denotes those who did not.

Participant Customer Surveys

The Evaluation Team surveyed 60 participating customers about their Program experiences. In order to capture customer response to the Program as modified for CY 2013, the survey sample included only customers with applications processed after April 1, 2013.

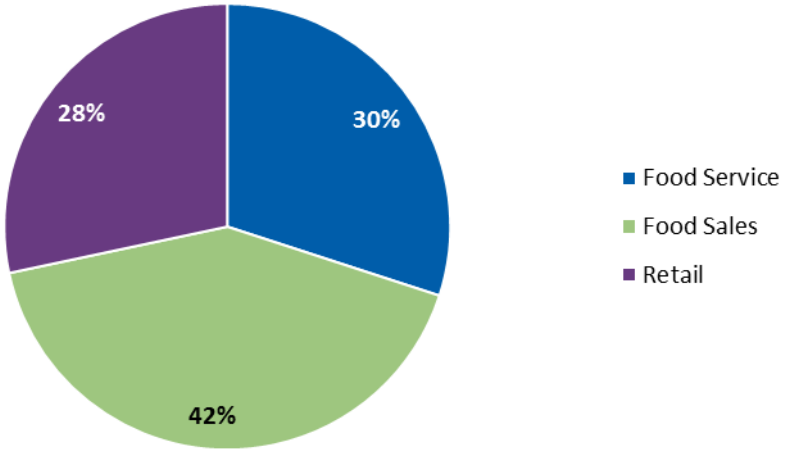
Of the 60 respondents, 50 had completed a project through the Program's prescriptive or custom rebate application processes. The remaining 10 respondents received direct install measures from the Program but did not complete any other projects through the Program.[62]

[61] As of October 2013.

[62] As of October 2013.

As Figure 142 shows, survey respondents represented each of the three business types that the Program serves.

Figure 142. Customer Survey Respondents by Business Type



Source: QL1. "What industry is your company in?" (n=60)

In the CY 2012 survey, over half of respondents said they leased at least some of the facilities where they made energy-efficiency improvements. In CY 2013, 40% of respondents reported leasing some of the facilities. According to survey results, direct install participants were more likely to occupy space under a lease. Sixty percent of direct install recipients leased facilities, whereas only 36% of non-direct install participants leased their facilities.

Database Analysis

The Evaluation Team analyzed the Program database for two process evaluation-related purposes:

- To compare direct install and non-direct install participants to assess the effectiveness of direct install as an outreach activity.
- To identify participants who used National Rebate Administrators and their contribution to Program savings.

Both analyses used project data from the Program's inception on April 1, 2012, through October 4, 2013.

Impact Evaluation

To calculate gross savings, the Evaluation Team reviewed the Program data in SPECTRUM along with data collected during participant phone surveys and on-site inspections.

Evaluation of Gross Savings

This section describes how the Evaluation Team assessed gross savings for the Chain Stores and Franchises Program.

For prescriptive and hybrid measures, the Evaluation Team determined gross savings using the following two approaches:

- **Deemed Approach:** The Evaluation Team calculated project savings using assumptions from current work papers and Focus on Energy's 2010 Deemed Savings Manual, with some parameter adjustments based on findings from on-site inspections and customer interviews. The Evaluation Team made adjustments for the following circumstances:
  - Reported quantities did not match the field-verified quantities.
  - Equipment specifications (e.g., capacity, efficiency) used in Program calculations did not match the installed equipment specifications.
  - The methodology used to stipulate Program savings was not transparent or there were apparent errors in Program savings calculations.
- **Verified Approach:** The Evaluation Team calculated project savings using data from on-site metering, on-site inspections, and customer interviews, along with Program assumptions as necessary.

Tracking Database Review

The Evaluation Team reviewed the CY 2013 data in SPECTRUM for completeness and quality. The data were thorough and complete; SPECTRUM generally contained all of the data fields necessary to evaluate the Program. In general, the extent and quality of project documentation increases with project complexity. The Evaluation Team consistently found supplemental documentation such as savings worksheets, calculations performed by participants or third-party contractors, energy audits, feasibility studies, product specifications, and invoices for equipment or contracting services in SPECTRUM for the hybrid and custom category measures as well as for some of the more complex prescriptive measures (compressed air, HVAC, and VFD).

The Evaluation Team found that application documents aligned with applicant, facility, and measure-eligibility requirements. The Evaluation Team also found participant and third-party savings algorithms were appropriate.

Gross and Verified Gross Savings Analysis

The Evaluation Team used data from the project audits and on-site inspections to analyze each sampled project. Project analysis relied on standardized measure- or category-specific Excel-based calculators, which the Evaluation Team developed for the CY 2013 evaluation.

After determining verified savings for each project, the Evaluation Team calculated project-level realization rates and rolled up weighted average results to the measure level. The Evaluation Team multiplied measure-level Program gross savings by the corresponding measure-level realization rate to arrive at total verified gross savings.

In addition to Program data, the Evaluation Team used deemed assumptions and algorithms to verify measure-level savings. The Evaluation Team developed the assumptions and algorithms using measure work papers and the 2010 Deemed Savings Manual for prescriptive and hybrid measures.

For measures not explicitly addressed in a work paper or the 2010 Deemed Savings Manual, the Evaluation Team developed savings algorithms and assumptions based on engineering judgment and best practices from other statewide Technical Reference Manuals. Typically, the Program Implementer classified such measures as custom measures in SPECTRUM.

Also as a part of the CY 2013 evaluation, the Evaluation Team developed a list of key parameters for common measures offered by the Program and compared the evaluated values with the stipulated values used in work papers and the 2010 Deemed Savings Manual. Based on the findings of this analysis, the Evaluation Team assessed the validity of the stipulated values used to estimate Program savings. The following sections discuss the key findings from the analysis.

Realization Rates

The Program achieved an overall evaluated realization rate of 99%. Thus, the Evaluation Team verified that the Program largely achieved the gross savings reported in SPECTRUM. For each sampled project, the Evaluation Team used data from project audits and on-site measurement and verification to calculate verified savings.

For each identified measure group, the Evaluation Team calculated the realization rate by dividing the total verified gross savings by the total reported gross savings. For measure groups not identified in the table, the Evaluation Team determined the reported savings did not need modification based on its review of the work papers submitted by the Program Implementer. Table 175 lists the CY 2013 realization rates for each measure group.

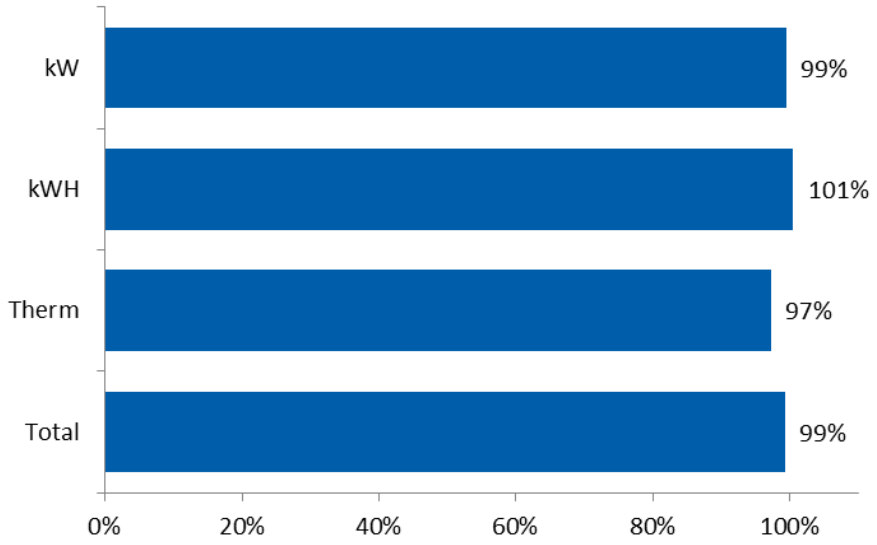
Table 175. Chain Stores and Franchises Program Realization Rates by Measure Group

Measure Group	Realization Rate			
	kWh	kW	Therms	MMBtu
Domestic Hot Water	98%	98%	65%[1]	74%
Lighting	101%	99%	100%	101%
Refrigeration	103%	91%	131%	105%
Total	**101%**	**99%**	**97%**	**99%**

[1]Therm realization rate is low due to several customers removing faucet aerators after installation.

Figure 143 shows the realization rate by fuel type.

Figure 143. Chain Stores and Franchises Program Realization Rate by Fuel Type



Summary of Gross and Verified Gross Savings

To calculate the total verified gross savings, the Evaluation Team applied measure-level realization rates to each measure group's savings. Table 48 lists the reported and verified gross savings, by measure type, achieved by the Chain Stores and Franchises Program in CY 2013.

Table 176. Chain Stores and Franchises Program Gross Savings Summary

Savings Type	Reported Gross			Verified Gross		
	kWh	kW	Therms	kWh	kW	Therms
Total Annual	53,206,722	9,077	1,176,558	53,495,479	9,031	1,144,921
Total Life-Cycle	635,220,129	9,077	16,857,490	638,714,522	9,031	16,559,508

Evaluation of Net Savings

This section describes how the Evaluation Team assessed net savings for the Chain Stores and Franchises Program.

Net-to-Gross Analysis

This section provides findings and commentary specific to the Business Incentive Program. For a detailed description of net-to-gross analysis methodology, please refer to Appendix L.

Freeridership Findings

The Evaluation Team used the self-report and standard market practice approaches to determine the Program's freeridership level. Table 177 identifies the freeridership approach the Evaluation Team applied to each measure type.

Table 177. Chain Stores and Franchises Program Freeridership Estimation Approach by Measure Group

Freeridership Estimation Approach	Measure Group
Self-Report and Standard Market Practice	Boilers & Burners Lighting
Self-Report	Agriculture Building Shell Compressed Air, Vacuum Pumps Domestic Hot Water Food Service HVAC Refrigeration

Self-Report Freeridership Estimates

The Program had average self-report freeridership of 51.0% in CY 2013. This freeridership rate represents a 32-percentage point increase from CY 2012, when the Program had a weighted average self-report freeridership rate of 19%. Compared with CY 2012 survey respondents, CY 2013 respondents were more likely to be 100% freeriders, and less likely to be 0% freeriders.

The Evaluation Team analyzed freeridership by project size in CY 2012 and CY 2013. The Evaluation Team determined that freeridership for the largest projects in the survey sample increased significantly from year to year. In CY 2012, the three respondents with the highest gross energy savings accounted for 46% of the survey sample's total gross savings, and all three respondents were 0% freeriders.

In CY 2013, the three respondents who achieved the greatest savings accounted for 30% of the total gross savings for the survey sample. These three respondents averaged 75% freeridership.[63]

The Evaluation Team analyzed CY 2013 freeridership by measure. As Table 178 shows, freeridership varied significantly across measures.

[63] Unweighted.

Table 178. Chain Stores and Franchises CY 2013 Freeridership by Measure

Measure	n	Average Freeridership
A/C Coil Cleaning	5	43%
Cooler Economizer/Cooler Evaporator Fan Control	2	0%
Fryer	1	100%
Furnace	1	0%
Heat Recovery	1	100%
Lighting	27	42%
Motor	4	15%
Refrigeration	1	0%
Refrigeration Tune-Up	5	71%

Based on CY 2013 interviews with National Rebate Administrators, the Evaluation Team believes that customers who use National Rebate Administrators have different decision-making processes than most local customers. Also, the customer survey sample did not include National Rebate Administrator customers. The Evaluation Team will prioritize establishing a separate freeridership (and spillover) estimate for National Rebate Administrator customers in the CY 2014 evaluation, and will apply the estimate retroactively for the quadrennium.

Standard Market Practice Freeridership Estimates

The Evaluation Team used standard market practice data to estimate freeridership for selected measures in two measure groups: Lighting and Boilers & Burners. shows the standard market practice freeridership value for each group.

Table 179. Chain Stores and Franchises Program Standard Market Practice Freeridership Estimates by Measure Group

Measure Group	Standard Market Practice Freeridership Estimate
Boilers & Burners	19.4%
Lighting	72.9%

Overall Freeridership Estimate

By combining the self-report and standard market practice freeridership data, the Evaluation Team estimated that the Chain Stores and Franchises Program had an overall average freeridership of 49% in CY 2013.

Spillover Findings

The Evaluation Team estimated participant spillover based on self-report survey data. Table 180 shows the spillover measures customers said they installed as a result of their program participation.

Table 180. Chain Stores and Franchises CY 2013 Spillover Measures

Measure Name	Quantity	Per-Unit Btu Savings	Total Btu Savings
Fluorescent Tube Lighting	25	167,195	4,179,873
High Efficiency Motor	4	4,086,722	16,346,888
Total	**29**		**20,526,761**

The Evaluation Team estimated spillover as 0.8% of the Chain Stores and Franchises CY 2013 Program savings. Program spillover in CY 2013 was comparable to CY 2012 spillover (0.4%).

Net-to-Gross Ratio

The Evaluation Team calculated an overall Chain Stores and Franchises Program net-to-gross estimate of 52%, as Table 181 shows.

Table 181. Chain Stores and Franchises Program Freeridership, Spillover, and Net-to-Gross Estimates

Measure Type	Freeridership	Spillover	Net-to-Gross
Overall	49%	1%	52%

[1] The Evaluation Team weighted the overall value by the distribution of evaluated gross energy savings for the Program population.

The Program's net-to-gross ratio declined by 30 percentage points from 82% in CY 2012. The Evaluation Team determined freeridership increased largely because of the increase in reported freeridership from some of the largest participants in CY2013.

It is important to note that the CY 2012 net-to-gross estimate was noticeably higher than prior findings in Wisconsin. As the Evaluation Team noted in the CY 2012 evaluation report, the net-to-gross ratio prior to the CY 2012 evaluation was 0.6 for lighting measures and 0.45 for HVAC.[64] The results of the CY 2013 net-to-gross analysis more closely align with estimates prior to the CY 2012 evaluation.

Net Savings Results

Table 182 shows the net energy impacts (kWh, kW, and therms) for the Chain Stores and Franchises Program. The Evaluation Team attributed these savings net of what would have occurred without the Program.

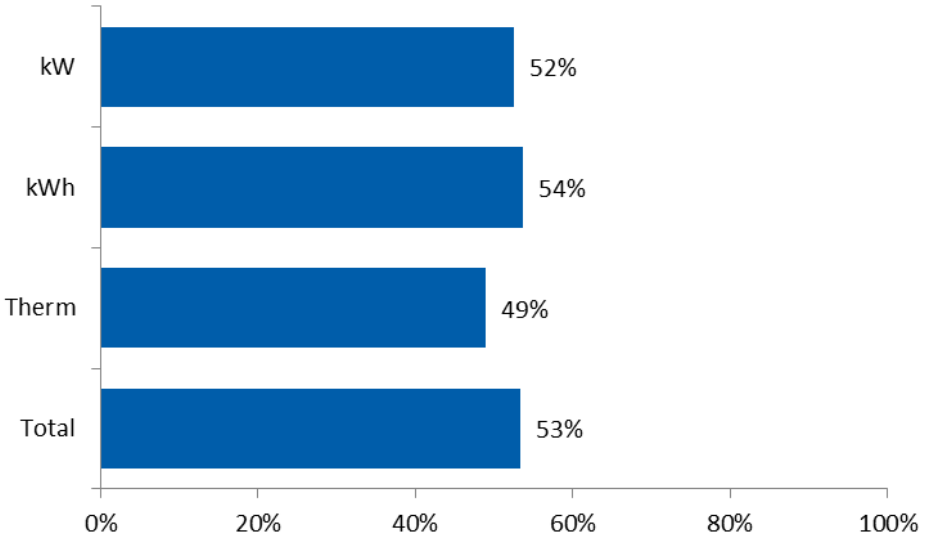
[64] The Evaluation Team based the stipulated net-to-gross ratios used in CY 2011 upon the results of the CY 2010 evaluation.

Table 182. Chain Stores and Franchises Program Net Savings

Savings Type	Verified Net		
	kWh	KW	Therms
Annual	28,544,068	4,765	575,922
Life-cycle	335,732,014	4,765	8,142,542

Figure 144 shows the net savings as a percentage of the *ex ante* gross savings by fuel type.

Figure 144. Chain Stores and Franchises Program Net Savings as a Percentage of *Ex Ante* Savings by Fuel Type



Process Evaluation

In addition to the general research questions, the CY 2013 process evaluation sought answers to several important process-related questions:

- What role do National Rebate Administrators play in the Program?
- How effective are special offerings at driving Program participation and deeper savings?
- How effective is the direct install effort at drawing in customers and prompting them to complete a non-direct install project through the Program?

Program Design, History, and Goals

In April 2012, Focus on Energy introduced the Program to target energy savings in in retail, food service, and food sales chains and franchises. In CY 2013, eligible customers could choose from any of the custom and prescriptive services offered to business customers in Focus on Energy's core programs.[65] The Program Implementer employed a managed account approach and worked with Trade Allies to encourage participation.

National Rebate Administrators, a stakeholder group unique to this Program compared to the other core nonresidential programs, provided third-party rebate aggregation and management services to national chains to calculate potential incentives and prioritize potential energy-efficiency projects.

In CY 2013, the Program met its goals for kWh and therm life-cycle savings. The Program Implementer shifted $100,000 from the Business Incentive Program, as permitted by the Program Administrator, to provide an incentive budget cushion and ensure the Program could reach its goals. The cushion proved unnecessary; the Program achieved its goals within the original budget.

Program Changes

In response to feedback from customers, Trade Allies, and the CY 2012 evaluation, the Program Administrator and Program Implementer changed the CY 2013 Program design in two important ways:

6. Increased number of eligible measures
7. Planned and executed new special offerings

Measure Eligibility Expanded

The CY 2012 evaluation found that customers and Trade Allies were less satisfied with the selection of eligible equipment than with other Program elements. They suggested that Focus on Energy add more lighting, refrigeration, controls, and building shell measures. Focus on Energy expanded the Program's eligible equipment selection April 1, 2013, adding lighting and refrigeration measures.

Special Offerings

The Program design includes special offerings available only for a limited period of time, usually three months. In CY 2012, the Program Administrator reported the special offerings to be a key strategy for driving deeper savings. Table 183 shows the special offerings extended through the Program in CY 2013.

[65] Focus on Energy's "core" business programs are the Business Incentive Program, the Large Energy Users Program, and the Chain Stores and Franchises Program.

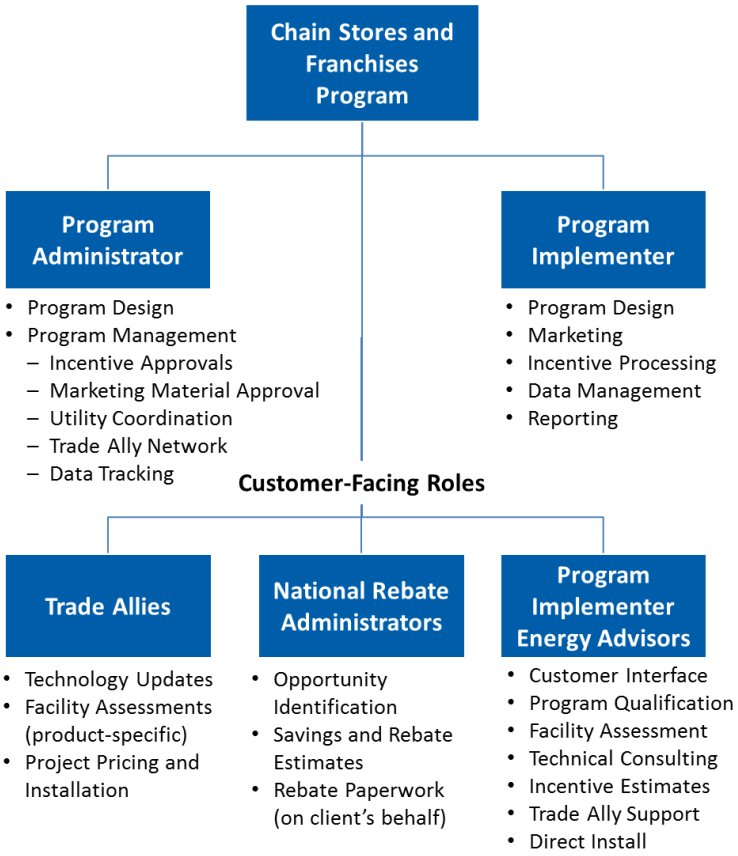
Table 183. Chain Stores and Franchises Program Special Offerings

Special Offering	Description
Competitive Energy-Efficiency Initiative	Allowed customers to apply for incentives above existing custom rates for projects that stalled due to lack of capital availability.
Refrigeration Makeover Bundle	Offered extra incentives for customers to complete a package of refrigeration-related measures.
Demand Controlled Ventilation	Offered extra incentives for customers to install demand-controlled ventilation.
ENERGY STAR LED Lamps	Offered higher-than-usual incentives for LED lighting.
LED Fuel Canopy	Offered higher-than-usual incentives for LED fuel canopy lighting.

Program Management and Delivery

This section describes the various Program management and delivery aspects the Evaluation Team assessed. Figure 145 shows a diagram of key Program actors.

Figure 145. Chain Stores and Franchises Program Key Program Actors and Roles



Management and Delivery Structure

The Chain Stores and Franchises Program Implementer also implements the Business Incentive Program. In the past, the two programs shared staff, but as of January 2013, all Energy Advisors worked exclusively on one program or the other. Some Implementer staff in support and oversight roles continues to assist both programs.

The Program has three customer-facing groups: Trade Allies, the Implementer's Energy Advisors, and National Rebate Administrators. The Chain Stores and Franchises Program is the only nonresidential program that works closely with National Rebate Administrators. In CY 2013, the Program Implementer held regular update calls with all three of the major National Rebate Administrators, in addition to their *ad hoc* communication about specific project-related matters.

National Rebate Administrators

Approximately 2% of Program customers used National Rebate Administrators to manage their participation in energy-efficiency programs for real estate portfolios spanning multiple states. The National Rebate Administrators maintained information on efficiency incentive programs nationwide, calculated incentive estimates for customers' projects, and managed all energy-efficiency program participation processes on customers' behalf. Although the number of participants who used National Rebate Administrators in CY 2013 was small, these participants were important to the Program; database analysis showed they contributed 36% of the Program's kWh life-cycle savings.

In these interviews, the National Rebate Administrators described several important characteristics of their interactions with customers and the Program:

- Customers submitted a list of projects in multiple states to the National Rebate Administrators for analysis.
- The National Rebate Administrators calculated the financial incentive amount available for each project and sometimes suggested alternate equipment choices that would garner higher incentives.
- The customer ranked the projects by financial appeal and moved forward with the top-ranked projects, completing as many as the customer's budget permitted. (One National Rebate Administrator estimated that his clients moved forward with approximately one third of the projects they considered.)
- The National Rebate Administrators managed all contact with the state or utility energy-efficiency program relevant to each project (filling out applications, contacting the program with questions, and monitoring application status).
- The customers were often unaware of the programs from which they received rebates.
- The Trade Ally who completed the project may be entirely unaware of having participated in a Program.

Program Data Management and Reporting

Administrator and Implementer staff reported that the performance problems they experienced in CY 2012 with SPECTRUM decreased in CY 2013. Nevertheless, the Evaluation Team observed that a midyear change to the data fields resulted in losing access to important customer contact information such as names and phone numbers.

In CY 2012, stakeholders cited two crucial gaps in SPECTRUM's capabilities:

- It could not notify the Administrator or Implementer staff of key process events such as when applications received approval or whether applications had not been approved after a certain period of time.
- The application "ownership" structure within SPECTRUM prevented Energy Advisors from creating reports to track the progress of their customers' applications.

The Evaluation Team determined these gaps still existed in CY 2013.

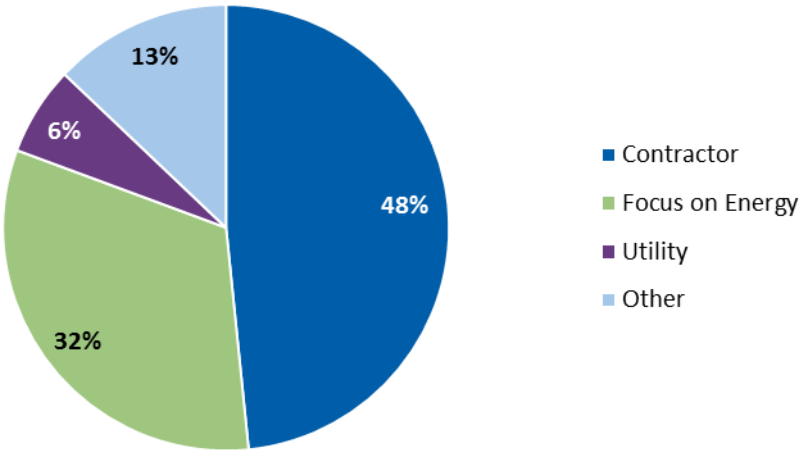
Marketing and Outreach

The Program directs marketing and outreach activities to three audiences:

- Customers
- Trade Allies
- National Rebate Administrators

Nearly half of the surveyed customers said they heard about the Program through a Trade Ally, and another third said they had heard about it from Focus on Energy directly. Figure 146 shows the number of respondents who cited each outreach source.

Figure 146. How Customers Learned About the Chain Stores and Franchises Program



Source: QB1. "How did your organization learn about the incentives available for this project from Focus on Energy?" (n=60, multiple responses allowed)

Direct Install Offering

A key element of the Program's marketing and outreach strategy is a direct install offering. Implementer staff installs simple energy- and water-saving measures and performs a basic walk-through assessment to provide customers with a list of recommendations for additional energy-efficiency projects.

The direct install offering serves two functions. First, the measures reduce consumption and thereby increase energy savings. Historically, the direct install offering has been an important source of natural gas savings for the Program. Second, the Program designers intended the direct install offering to serve as a "foot in the door" to introduce customers to the Program and drive additional projects. According to the Implementer, it also seeks to re-engage customers who had not participated in the program recently, and acts as a means to collect on-site data on potential future projects.

In CY 2013, the Program offered the following direct install measures:

- Coil cleaning
- CoolerMiser™
- Faucet aerator, 0.5 gpm (restroom)
- Faucet aerator, 1.5 gpm (kitchen)
- LED lamp, walk-in cooler
- LED lamp, walk-in freezer
- Pre-rinse sprayer, 1.28 gpm

In a survey of 10 customers who participated only in the direct install component, five respondents (50%) reported receiving an assessment report with recommendations for additional energy-efficiency projects. Four of the five respondents said they had completed some or all of the recommended projects, and the fifth respondent planned to complete at least one project in the future.

The Evaluation Team conducted a database analysis of direct install projects since the Program's inception and found that 46% of customers who received direct install measures (56 of 121) also completed a non-direct install project through the Program.[66] Of these 56 participants, nearly a quarter (13 participants)—or 11% of all 121 direct install participants—received direct install measures before completing their first non-direct install project.

Forty-three of the 121 direct install participants (35%) had completed at least one Program project before receiving a direct install measure. The database analysis revealed a pattern of customers who interspersed direct install and non-direct install projects over time.

Program Satisfaction

This section presents an overview of customer, Trade Ally, and National Rebate Administrator ratings of Program satisfaction. An in-depth discussion of key Program elements follows the overview and includes respondent feedback on the custom project preapproval process, the incentive application process (custom and prescriptive paths), the eligible equipment selection, and the Program's special offerings.

Customer Satisfaction

Figure 147 shows the number of customers who said they were "very satisfied" with selected elements of the Program in CY 2012 and CY 2013. More than 90% of respondents said they were "very satisfied" with their contractors and with the Program overall. Customers also reported high satisfaction ratings (more than 60% said they were "very satisfied") with the time it took to receive incentives (72%), selection of eligible equipment (69%), and clarity of eligibility requirements (64%). Fewer customers reported they were "very satisfied" with other Program elements, such as communication with Focus on Energy, the application process, the incentive amounts, the custom preapproval process, and the Focus on Energy website, which ranked lowest among all of the Program elements. Only 25% of the respondents reported they were "very satisfied" with the website.[67]

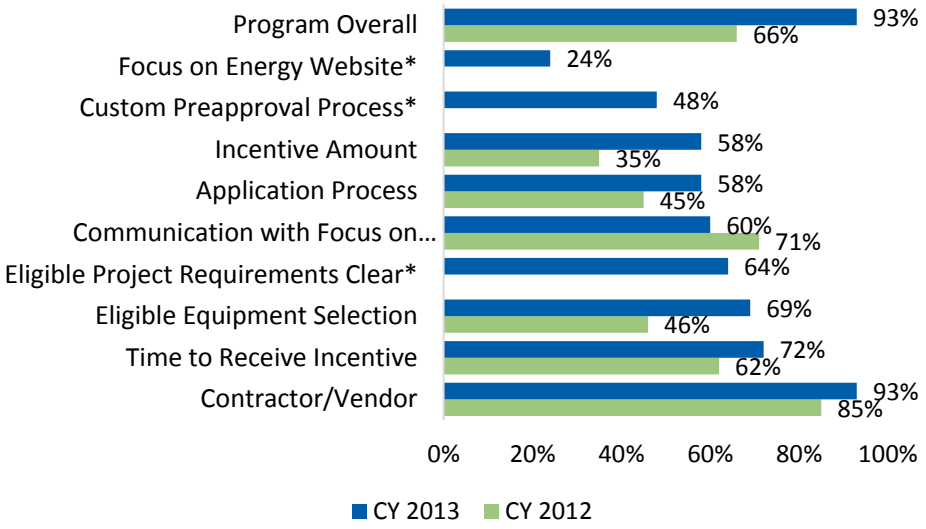
In addition, more customers reported they were "very satisfied" in CY 2013 (as compared to CY 2012) for all categories except one: communication with Focus on Energy. In CY 2013, 93% of surveyed customers were "very satisfied" with the Program overall, and only 66% of respondents were "very satisfied" in CY 2012. Customer satisfaction with incentive amounts and the selection of eligible equipment also increased markedly in CY 2013.

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[66] The database analysis reviewed data entered from April 1, 2012, through October 4, 2013.

[67] In order to capture customer response to the Program as modified for CY 2013, the survey sample included only customers with applications processed after April 1, 2013.

Figure 147. Customer "Very Satisfied" Ratings with Various Program Aspects in CY 2012 and CY 2013

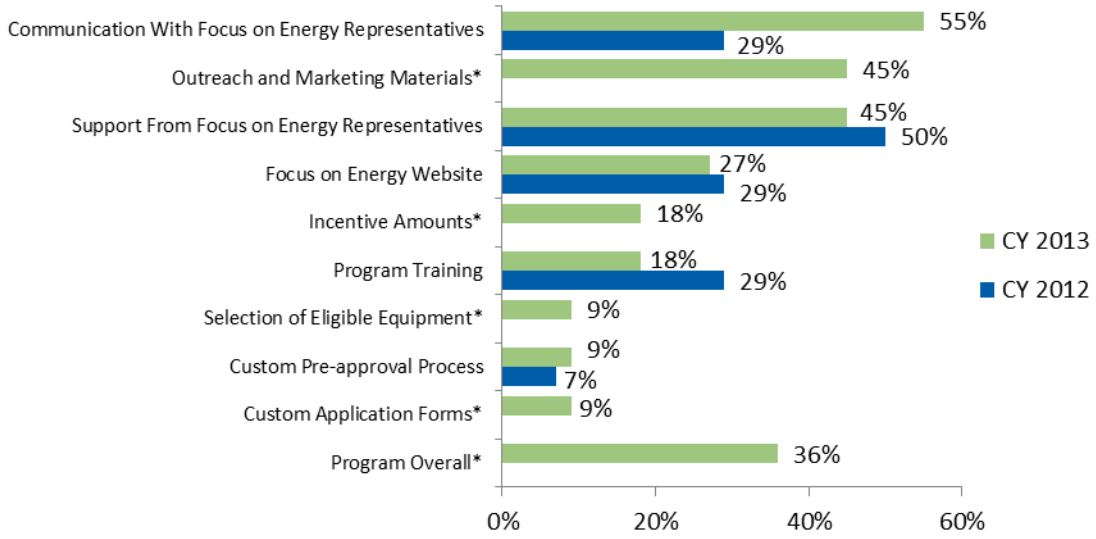


Source: QG1. "I will ask about some different parts of the project. Please indicate if you are very satisfied, somewhat satisfied, not too satisfied, or not at all satisfied with each of these areas."
(n=50 in CY 2012; n=60 in CY 2013).
*New questions for CY 2013

Trade Ally Satisfaction

As in CY 2012, Trade Allies were less satisfied with the Program than participating customers. In CY 2013, 36% of the surveyed Trade Allies were "very satisfied" with the Program overall. Also similar to CY 2012, Trade Allies ranked their satisfaction with Program support higher than with Program processes. Figure 148 shows the percentage of Trade Allies who said they were "very satisfied" with selected elements of the Program in CY 2012 and CY 2013.

Figure 148. Trade Ally Satisfaction with Various Program Aspects in CY 2012 and CY 2013



Source: Q9. "I'm going to ask you about several different Program elements. For each, please tell me if you are very satisfied, somewhat satisfied, not too satisfied, or not at all satisfied."
(n=14 in CY 2012; n=11 in CY 2013)
*New questions for 2013

Trade Allies were least satisfied with the Program's custom project processes and the selection of eligible equipment. As previously discussed, some Trade Allies found the custom path overly cumbersome, and some Trade Allies reported the process for determining eligible equipment lacked transparency.

Trade Allies were more satisfied with Program support. However, a few Trade Allies said the quality of support they received was inconsistent, commenting that "some representatives do a better job than others."

Like customers, Trade Allies ranked their satisfaction with the Focus on Energy website the lowest among the Program elements. Three Trade Allies characterized the website as hard to navigate. Only one out of the 14 Trade Allies reported receiving leads from the website's "Find a Trade Ally" search tool.

National Rebate Administrator Satisfaction

The three National Rebate Administrators interviewed reported high satisfaction with the Program. All three respondents ranked the Program in the "top five" of the hundreds of programs with which they interact. They reported the Program was simple and easy to use. They particularly praised the Program's wide array of prescriptive offerings, which they and their customers preferred over the custom path. Additionally, the National Rebate Administrators reported working with a "fantastic" Implementer staff.

Key Program Processes

The Evaluation Team's data collection activities yielded important findings about several of the Program's key processes. The following sections provide more insights about these Program components, comparing and contrasting customer, Trade Ally, and National Rebate Administrator ratings.

Custom Project Preapproval Process

Customers and Trade Allies ranked their satisfaction with the Program's custom project preapproval process significantly lower than their satisfaction with other Program components and with the Program overall. Less than half of customers were "very satisfied" with the preapproval process, whereas 93% were "very satisfied" with the Program overall. Less than 10% of Trade Allies were "very satisfied" with the preapproval process, whereas 36% were "very satisfied" with the Program overall.

When asked why they were not satisfied with the custom project preapproval process, two Trade Allies said that it took too long. Two customers said the process required too much detail and could have been simpler.

Two National Rebate Administrators reported having used the custom path. One said it was "simple" and "easier than most utilities' programs." The other said that the process took too long, stating the ideal approval timeframe would be three to four weeks.[68]

Incentive Application Process

According to survey results, customers and Trade Allies both interacted with the Program's incentive application process, as Figure 149 shows.

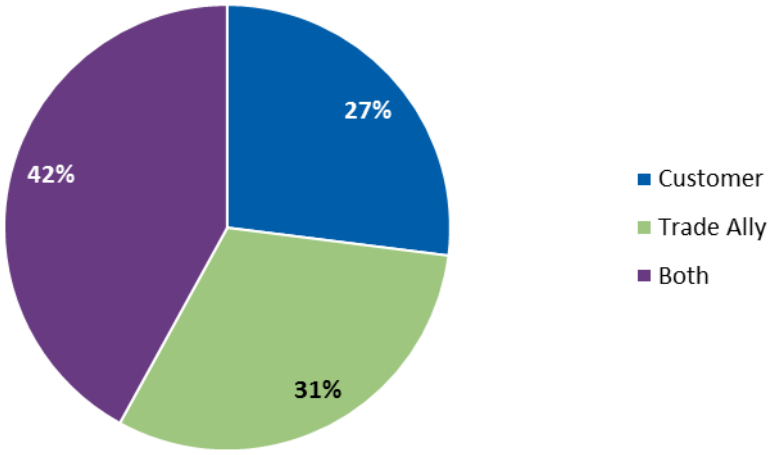
Customers and Trade Allies ranked their satisfaction with the Program's incentive application significantly lower than their satisfaction with the Program overall. Although customers' satisfaction with the Program improved from CY 2012 to CY 2013—93% were satisfied with the Program overall, only 58% of customers were "very satisfied" with the application process. Less than 10% of Trade Allies were "very satisfied" with the custom application forms, whereas 36% were satisfied with the Program overall.

When asked why they were not satisfied with the custom incentive application process, four Trade Allies said that it was too complex to justify pursuing the amount of incentive available. Two customers said the application form was too technical and confusing.

National Rebate Administrators, by contrast, said that the application process was simple, clearly defined, and easy to complete. One National Rebate Administrator said the Program was better than average in terms of the time it took to receive the incentive check.

[68] According to the Program Implementer, the average preapproval turnaround time was 6.98 days in CY 2013.

Figure 149. Who Completed the Financial Incentive Application



Source: Chain Stores and Franchises Customer Survey: QA7. "Did your organization complete the application for the financial incentives, or did the contractor or vendor do that for you?" (n=50)

Eligible Equipment Selection

In CY 2013, customers again ranked their satisfaction with the selection of eligible equipment lower than their satisfaction with the Program overall. However, customer satisfaction with the equipment selection increased markedly from last year, with 69% of the customers reporting they were "very satisfied" in CY 2013 compared to 46% in CY 2012.

When asked what types of equipment they would like Focus on Energy to add to the Program, customers requested additions in five measure categories:

- 18 said lighting
- 11 said HVAC
- Eight said refrigeration
- Six said building shell
- Six said other types of measures

This section lists the equipment that respondents said they would like Focus on Energy to include in the Program in each of the five categories (verbatim responses). Even when pressed for specifics, many respondents were unable to identify a particular item they would like to see added to the Program, responding with a generic equipment type such as "indoor lighting." Others said they were unaware of Program options and that they were "not sure what is available." As such, much of the suggested equipment already qualifies for a Program incentive. One participating customer said, "LED lights were

not approved and then they were [approved]… [I] was a little confused." According to the Program Implementer, all of the suggestions were eligible for Program incentives in CY 2013.

Lighting

- "A/C [air conditioning] access control/monitoring system."
- LED lighting; interior and exterior (three respondents)
- "Eight-foot lighting."
- Canopy lighting (three respondents)
- "LED light for the canopy."
- "Refrigeration lighting."
- "More lighting upgrade options."
- "Indoor/outdoor lighting programs."
- Indoor and outdoor lighting (two respondents)
- Indoor lighting (two respondents)

HVAC

- "A/C access control/monitoring system."
- "Anything related to an incentive."
- "HVAC units."
- "Rooftop HVAC units."
- "Saving energy in entrance ways."
- Bigger type of program for HVAC systems
- Natural gas boiler/leases/need more efficient equipment
- "Need clarification on what programs are available."
- "Replacement equipment."
- "Units are very expensive to replace. Customer would choose best unit available if incentives were available to offset the cost."

Building Shell

- "Not sure what options are available."
- "Metal fab building to help the efficiency."
- "More information on the building shell program and what is offered."
- "More efficient windows and doors."
- "Retiming of dual doors."

Refrigeration

- "Cooler lighting and refrigerator."
- "Generalized equipment needed in an old building."
- "Services for cooler equipment such as sealing around doors."
- "Coolers updated."
- "LED lighting for inside the freezer and cooler doors."
- "What programs are available for refrigeration?"
- "Energy reduction of freezer/cooler."
- "New refrigerator and dairy case."

Other

- "Cost-share program."
- "Cooler, freezer, and ceiling lights."
- "Additional open deck casing such as dairy meat deli."
- "Green technology that is cost-effective."
- "Controlling temperature in entryways."

In CY 2013, Trade Allies also ranked their satisfaction with the eligible equipment selection lower than their satisfaction with the Program overall. When asked for specifics, two Trade Allies said that the process of determining equipment eligibility lacked transparency. For example, one Trade Ally believed that some Trade Allies may have received more favorable eligibility rulings from the Program Implementer than others.

National Rebate Administrators characterized the selection of equipment eligible for the Program as comprehensive. "Knowing what is offered helps a lot," one added.

Special Offerings

Program Administrator and Implementer staff reported that only the Program's two special offerings related to lighting (LED lamps and canopy lighting) met performance expectations.

National Rebate Administrators said that the timing of the Program's special offerings did not align with customers' decision-making processes. For example, National Rebate Administrator said that customers take about six months to make capital budget decisions, with budgets developed on a yearly basis. Another National Rebate Administrator reported that customers assign resources to capital projects early in the calendar year, so offerings that launch in the summer (or later) are too late to have an impact.

Trade Allies said that the special offerings were successful in getting the customer's attention in some cases. However, two Trade Allies described the special offerings as confusing, and one Trade Ally said that the limited timeframe for the special offerings made them too risky to include in a project quote. Another Trade Ally said he thought a special offer for gas station canopy lights lasted only one-and-a-half months—a timeline too short to find customers and develop projects with the appropriate decision-makers. Even though the incentive was considerable, this Trade Ally did not take part.

The majority of surveyed customers (56%) said they were unaware of any Program special offerings in CY 2013. Of the 12 customers who reported they were aware of one or more special offerings, nine had applied or were in the process of applying for one.

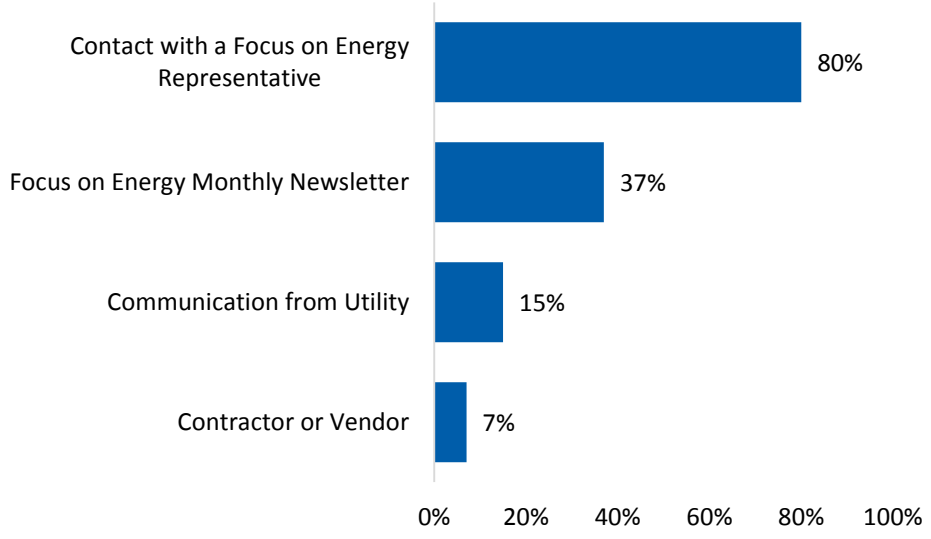
Suggestions for Program Improvements

When asked to suggest ways that Focus on Energy could improve the customer's experience, 75% of the respondents said "nothing." Of the 25% who had suggestions, over half of respondents (eight of 15) asked for better/more communication.

As shown in Figure 150, of the 60 surveyed customers:

- 80% preferred direct contact with a Focus on Energy representative
- 37% preferred the Focus on Energy monthly newsletter
- 15% preferred communication from the utility
- 7% preferred communication with a contractor or vendor

Figure 150. Customers' Preferred Communication Channel



Source: QM1. "In the future, how would you like to stay informed about opportunities to save energy and money?" (n=60)

Program Cost-Effectiveness

Evaluators commonly use cost-effectiveness tests to compare the benefits and costs of a demand-side management program. The benefit/cost (B/C) test used in Wisconsin is a modified version of the total resource cost (TRC) test. Appendix I includes a description of the TRC test.

Table 184 lists the CY 2011-2013 incentive costs for the Chain Stores and Franchises Program.

Table 184. Chain Stores and Franchises Program Incentive Costs

	CY 2013	CY 2011-2013
Incentive Costs	$3,226,041	$5,261,743

The Evaluation Team found the CY 2013 Program to be cost-effective (a TRC benefit/cost ratio above 1). Table 185 lists the evaluated costs and benefits.

Table 185. Chain Stores and Franchises Program Costs and Benefits

Cost and Benefit Category	CY 2013	CY 2012
Costs		
Administration Costs	$406,741	$294,815
Delivery Costs	$1,660,892	$1,203,852.67
Incremental Measure Costs	$10,333,749	$17,086,287
Total Non-Incentive Costs	$12,401,381	$18,584,955
Benefits		
Electric Benefits	$34,245,400	$24,333,599
Gas Benefits	$5,642,443	$4,345,772
Emissions Benefits	$14,452,645	$10,158,695
Total TRC Benefits	$54,340,488	$38,838,066
Net TRC Benefits	**$41,939,107**	**$20,253,111**
TRC B/C Ratio	**4.38**	**2.09**

Evaluation Outcomes and Recommendations

Overall, the Program performed well in CY 2013. It met its energy savings goals while achieving high customer and National Rebate Administrator satisfaction.

The direct install effort was effective in increasing the Program's energy savings, particularly in natural gas. Through the direct install option, Focus on Energy recruited 13 new customers who went on to complete energy-efficiency projects through the Program, notably in leased spaces.

Additionally, the Program Administrator and Program Implementer were responsive to feedback and made adjustments to the Program based on input from customers, Trade Allies, and the CY 2012 evaluation recommendations. The overall rise in customer satisfaction scores from CY 2012 suggests that these adjustments were effective in addressing customers' concerns.

Nonetheless, low Trade Ally satisfaction scores and low customer satisfaction scores with certain Program elements indicate potential for improvement.

The Evaluation Team identified the following outcomes and recommendations to improve the Chain Stores and Franchises Program in CY 2014.

Outcome 1. Customers and Trade Allies lacked awareness of equipment eligible through the Program.

Although National Rebate Administrators ranked the Program among the best in the country in terms of equipment selection, customers and Trade Allies reported relatively low satisfaction with the Program's selection of eligible equipment. However, few respondents could identify specific measures they would like added to the list. Customers also said they were not aware of the Program's eligible equipment offerings, and a few Trade Allies requested greater transparency in determining whether or not equipment is eligible under the Program. These seemingly conflicting responses suggest that customer and Trade Ally dissatisfaction may arise more from a lack of familiarity with the Program's offerings rather than from actual gaps in the Program's eligibility coverage.

Recommendation 1. Develop and target marketing and outreach efforts to increase customer and Trade Ally awareness of the full breadth of equipment eligible under the Program.

- Host group meetings to seek input from customers and Trade Allies in an open dialogue fashion.
- Develop messaging that emphasizes the Program's broad range of eligible equipment and flexibility to add equipment through the exception process. For example, "The Chain Stores and Franchises Program covers the energy-efficient equipment your business needs [or "sells," for Trade Allies]. Don't see what you're looking for? Contact an Energy Advisor to discuss your options."
- Create flyers for Trade Allies to give to customers highlighting the Program's comprehensive offerings. For example, "Congratulations on your efficient lighting project! Did you know that the Chain Stores and Franchises Program also offers incentives for efficient refrigeration, HVAC, and kitchen equipment?"
- Consider creating targeted, easily-accessible website content for the three distinct business types that the Chain Stores and Franchises Program serves (retail, food service, and food sales), with information on the specific types of equipment those businesses commonly use.

Outcome 2. Large out-of-state customers, particularly those who use National Rebate Administrators, demonstrated potential to deliver large energy savings.

Therefore, attracting large out-of-state customers is important to Program growth, and driving increased participation by these customers requires a different approach than smaller, locally-based businesses.

Large chain stores headquartered outside Wisconsin offer great potential for energy savings. However, these owners make decisions and execute energy-efficiency projects differently than most other customers eligible for Focus on Energy's business. For example, they:

- Often use National Rebate Administrators, which act as a conduit for projects but also act as a barrier between customers and the Program.
- Decide whether to move forward with a project based heavily on the amount of financial incentive available relative to other projects.
- Can choose among programs in multiple states.

Recommendation 2. Modify the Program's design and/or outreach to more effectively attract investment from large out-of-state customers. For example, consider:

- Creating customer-specific incentive and marketing packages contingent on performance (for example, completing a certain number of measures or investing a certain dollar amount).
- Partnering with outside funding sources (such as state and local economic development agencies) to provide additional incentives in exchange for commitments to complete energy-efficiency projects in Wisconsin.

Outcome 3. The Program's special offerings generated savings from lighting but had limited success driving comprehensive projects.

Focus on Energy devotes significant resources to creating the Program's special offerings. The lighting-related special offerings were successful in helping the Program meet its energy savings goals, because customers and Trade Allies could complete lighting projects within the special offering's time frame.

The other offerings, which aimed to encourage non-lighting projects, fell short of expectations. The limited timeframe for the special offerings does not align with how many chain store and franchise operators plan their capital budgets. Trade Allies are hesitant to incorporate temporary offerings into job quotes (in case the project gets delayed).

Recommendation 3. Consider other ways to use special-offering resources to support deeper savings such as:

- Creating a permanent tiered or bundled incentive structure that pays higher incentives for more comprehensive projects.
- Creating a referral program to encourage Trade Allies to team up for comprehensive projects or offer leads to other Trade Allies.
- Creating special offerings that allow provides assurance that funds will be available for an extended decision and implementation period of up to two years.

Outcome 4. Most customers and Trade Allies reported low satisfaction with the Program's communications, particularly related to the website.

Recommendation 4. Identify and implement ways to improve Program communications such as:

- Conducting focus groups and/or surveys to specifically address Program communications.
- Conducting usability testing to track how the website performs in real-life customer and Trade Ally usage scenarios.
- Creating targeted website content for the three distinct business types that the Program serves (retail, food service, and food sales), with information on the specific types of equipment those businesses commonly use.
- Creating offline information resources for Trade Allies to use when away from a computer.

Outcome 5. The Program's preapproval and incentive processes are relatively straightforward, especially in comparison to similar programs in other states, but are still confusing and cumbersome to some customers and Trade Allies.

National Rebate Administrators, who specialize in completing rebate program processes and dedicate full-time staff to them, praised the Program for its simplicity and ease of use, as did some customers and Trade Allies who had worked with the Program repeatedly. Customers and Trade Allies who interact with these processes only occasionally, and in addition to their regular work duties, found the Program's processes difficult.

Recommendation 5. Identify and implement ways to help customers and Trade Allies become more comfortable with the preapproval and incentive application processes.

Consider a dual strategy that engages customers and Trade Allies based on how often they interact with the Program:

- For customers and Trade Allies who complete a significant number of projects each year, offer an in-depth, hands-on workshop to train one or two staff members from each organization to become experts on the Program's processes.
- For customers and Trade Allies who complete projects only occasionally, consider identifying and/or helping create a business that would perform a role for locally-based organizations similar to what the National Rebate Administrators offer their clients on a national basis. In other words, this business would specialize in filling out Program paperwork and managing the rebate process for firms who cannot afford to keep a designated expert on staff. Payment for the service could come from the customers and Trade Allies directly, as a deduction from the customer's incentive payment, from the Program directly, or from some combination of these sources.

Outcome 6. Stipulated motor horsepower used for electronically commutated motors (ECMs) in cooler/freezer case applications was substantially higher than encountered during the CY 2013 evaluation.

The Program used a deemed motor horsepower value of 55 watts. The average motor horsepower the Evaluation Team verified during site visits in the CY 2013 evaluation was 20 watts. This discrepancy resulted in lower realization rates.

Recommendation 6. Use a multitiered approach to estimate project savings instead of a single horsepower assumption.

Allowing for greater granularity in reporting horsepower will improve the accuracy of reported savings.

Outcome 7. Customers removed high-efficiency faucet aerators from direct install project sites.

The Evaluation Team identified several direct install projects where the Program Implementer installed faucet aerators that the customer subsequently removed. To calculate verified savings, the Evaluation Team had to either discount or not credit savings from these projects.

The Evaluation Team has encountered this issue on similar evaluations of direct install programs across the country and has found that 0.5-gpm faucet aerators are particularly susceptible to removal. This is especially true for commercial restroom applications, where users commonly complain about "insufficient flow" or "having to wait too long for hot water." In other programs, the Evaluation Team has encountered faucet aerator removal on approximately 40% of the sampled direct install projects involving the installation of 0.5-gpm faucet aerators.

Recommendation 7. Consider providing educational materials with direct install measures to reduce the likelihood of removal.

Educational materials can help to increase awareness. Alternatively, the Program may consider reassessing installation criteria and avoiding installing faucet aerators with low flow rates in high-frequency locations like commercial restrooms.

Large Energy Users Program

The Large Energy Users Program (the Program) delivers technical services as well as prescriptive and custom incentives to Wisconsin's largest commercial, industrial, and institutional customers, to encourage these customers to reduce energy usage and increase energy efficiency in their facilities. Leidos, the Program Implementer, primarily delivers these services through direct contact using Energy Advisors (who receive support from Trade Allies and utility Key Account Managers). The Energy Advisors and Key Account Managers also work with the customers' energy management teams to provide technical expertise, identify energy-efficiency opportunities, and support the development of strategic energy management plans.

The Program's design changed slightly in CY 2013, with a few adjustments to the custom project qualification and incentive structure. The changes allowed customers to capture savings from larger, more complex, and costlier projects that did not qualify under the previous guidelines. Focus on Energy also directed new Program initiatives and staff resources to the healthcare sector. Customers in this sector often manage many buildings on a single healthcare campus, or multiple campuses of buildings. When a customer in this sector makes a decision to install an energy-efficient measure, that decision can often be applied to multiple buildings, thereby increasing customer savings and improving the efficiency of the time spent by Program staff to capture these savings.

The savings, participation, spending, and cost-effectiveness values throughout this Program chapter exclude Renewable Energy Competitive Incentive Program measures. Savings, participation, spending, and cost-effectiveness values for those measures appear in the Renewable Energy Competitive Incentive Program chapter of this report.

Table 186 lists the Program's spending, savings, participation, and cost-effectiveness.

Table 186. Large Energy Users Program Actuals Summary[1]

Item	Units	CY 2013 Actual Amount	CY 2012-2013 Actual Amount
Incentive Spending	$	$ 8,401,437	$ 13,753,695
Verified Gross Life-Cycle Savings	kWh	1,742,195,225	2,595,447,173
	kW	17,549	26,789
	therms	139,358,987	201,513,460
Net Annual Savings	kWh	102,477,432	168,724,286
	kW	12,924	21,023
	therms	7,525,715	10,603,644
Participation	Unique Customers	367	559
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	6.90	6.33 [2]

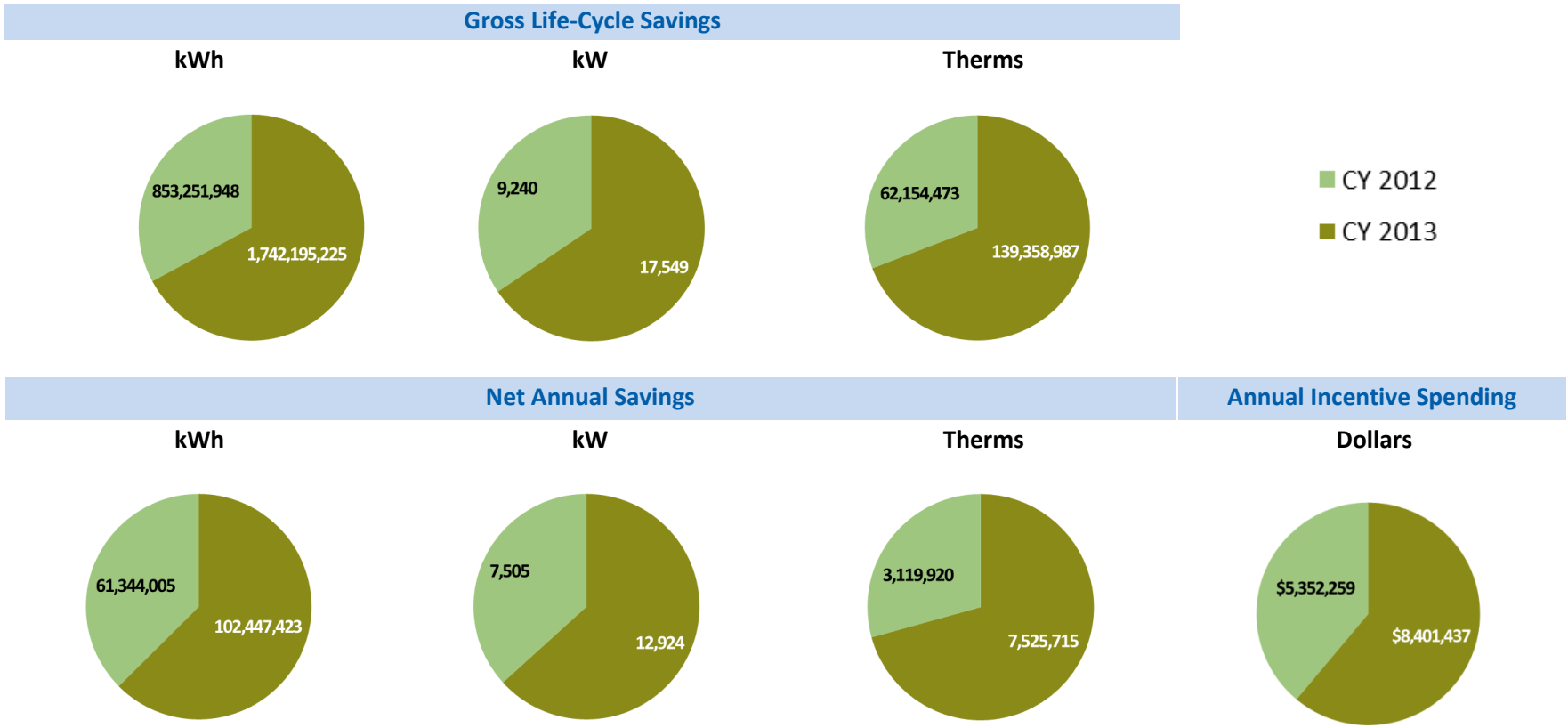
[1]This table presents gross life-cycle savings to allow comparison with Focus on Energy's quadrennial gross life-cycle savings target, and net annual savings to allow assessment of the Program Administrator and Program Implementer's achievement of

net annual savings.

[2] The cost-effectiveness ratio is for CY 2012 only.

Figure 151 shows savings and spending in CY 2012 and CY 2013. Because the Program was not active in CY 2011, it did not achieve any savings during that year. In addition, the Program launched in April 2012 and was active only for nine months in CY 2012.

Figure 151. Large Energy Users Program Three-Year (CY 2011-2013) Savings and Budget Progress



Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted impact and process evaluations for CY 2013. These were the key questions that directed the Evaluation Team's design of the EM&V approach:

- What are the verified gross and net electric and gas savings?
- How effective and efficient are the Program's operations?
- How can the Program's delivery processes cost-effectively increase its energy and demand savings?
- How effective are the Program's marketing, outreach, and communication efforts in reaching targeted customers and influencers?
- What are the barriers to increased customer participation, and how effectively is the Program overcoming these barriers?
- How satisfied are customers and Trade Allies with the Program, and how have satisfaction levels changed since CY 2012?
- Is the Program meeting cost-effectiveness requirements?
- How can Focus on Energy improve Program performance?

The Evaluation Team also expanded the CY 2013 process evaluation scope to assess the role and influence of customer energy teams within their companies. The inquiry focused on these areas:

- How effective is the Program in helping customers form and sustain energy teams?
- What services do energy teams provide their companies?
- Do energy teams influence their companies' energy-related decisions?
- How satisfied are the energy teams with the support provided by the Program?
- What barriers do energy teams encounter in identifying and completing energy-efficiency projects?
- How can the Program help energy teams overcome these barriers?

The Evaluation Team designed the EM&V approach to integrate multiple perspectives in assessing Program performance. Table 187 lists the specific data collection activities and samples sizes used to evaluate the Program.

Table 187. Large Energy Users Program Data Collection Activities and Sample Sizes

Activity	CY 2013 Sample Size (n)	CY 2011-2013 Sample Size (n)
On-Site Measurement and Verification	62	88
Project Audit Only	38	87
Participant Customer Surveys	60	82
Customer Energy Team Interviews	10	10
Participant Trade Ally Interviews	4	19
Program Administrator, Program Implementer, Energy Advisor, and utility Key Account Manager Interviews	15	32

Percentages shown in tables and figures throughout the report may total to greater than 100% due to rounding.

Data Collection Activities/Impact Evaluation

For the impact evaluation, the Evaluation Team conducted a combination of project audits, and on-site inspections.

The Evaluation Team selected a random stratified sample of projects to audit and conducted on-site M&V activities that focused on the measure groups with the largest contribution of savings to the Program. lists the contribution of gross savings by measure group, and Table 189 lists the sample sizes for each evaluation activity by measure group.

Table 188. Large Energy Users Program Gross Savings Contribution by Measure Group

Measure Group	Percentage of Savings		
	(kWh)	(kW)	(Therms)
Agriculture	1%	1%	-
Boilers and Burners	<1%	<1%	16%
Building Shell	-	-	1%
Compressed Air and Vacuum Pumps	19%	21%	5%
Domestic Hot Water	<1%	<1%	<1%
Food Service	<1%	<1%	<1%
HVAC	22%	22%	40%
Industrial Ovens and Furnaces	-	-	<1%
Information Technology	4%	1%	-
Lighting	21%	22%	-
Motors and Drives	<1%	<1%	-
Other	<1%	<1%	-
Process	26%	26%	37%
Refrigeration	3%	4%	-
Renewable Energy	<1%	<1%	-
Vending and Plug Loads	<1%	-	-
Waste Water Treatment	3%	3%	<1%
Total[1]	**100%**	**100%**	**100%**

[1]Columns may not sum to 100% due to rounding.

Table 189. Large Energy Users Program Sample Size for Each Evaluation Activity by Measure Group

Measure Group	Project Audit Only	Project Audit and On-Site Inspection	Metering[1]
Process	6	5	5
HVAC	4	10	5
Compressed Air	3	10	3
Boilers and Burners	-	10	-
Lighting	25	27	5
Total	**38**	**62**	**18**

[1]Metering is a subset of the on-site inspections.

Project Audits

Project audits consisted of a detailed review of all relevant documentation available through SPECTRUM, including:

- Project applications
- Savings worksheets

- Savings calculations performed by participants or third-party contractors (if applicable)
- Energy audits or feasibility studies
- Customer meter data
- Invoices for equipment or contracting services
- Any other documentation submitted to Focus on Energy

As part of the project audits, the Evaluation Team conducted participant surveys consisting of e-mails and follow-up phone conversations to collect information not available in SPECTRUM.

The Evaluation Team developed measure- and category-specific survey forms to facilitate data collection and ensure inspectors collected the appropriate data. Each survey form included key parameters, procedural guidelines for the on-site inspectors, and survey questions pertaining to eligibility, facility operations, and general building information.

In addition, the forms typically included the savings algorithms used to determine Program gross savings. The Evaluation Team used these data collection forms for desk-review and on-site inspection projects.

On-Site Inspections

The Evaluation Team conducted on-site inspections for high-priority measure groups and for measures with uncertain savings. The Evaluation Team identified measures for on-site inspection using the findings from the CY 2012 evaluation cycles, selecting individual projects based on their complexity and overall contribution to the gross savings among the sampled projects. Projects sampled for on-site inspections also received project audits. High-priority measures included:

- VFD, process fans
- VFD, process pumps
- VFD, HVAC Fans
- Compressed air measures
- HVAC controls and energy management systems
- Boilers and burners

During on-site inspections, the Evaluation Team gathered data regarding various savings input assumptions to confirm accuracy of the estimation metrics, to identify the discrepancies between reported and verified savings and to verify energy impacts of measures. As part of this evaluation, the Evaluation Team identified and compiled key parameters for all evaluated measures and compared the actual or estimated values, determined from on-site inspections and customer interviews, with the assumed values used to estimate savings.

Inspectors used a variety of specific on-site data collection methods that varied depending on the measure type, often employing stand-alone data-logging devices and performing spot power

measurements. When data loggers could not be safely deployed or when metering was not permitted by the customer, inspectors reviewed daily operations and maintenance logs, gathered system set points and operating conditions from central energy management systems, and reviewed the historic trend data, if available. Inspectors also commonly requested a customer initiate trends during a site visit to collect real-time energy consumption data, following up with that customer several weeks later to obtain the results.

Evaluation, Measurement, and Verification

Field inspectors primarily performed metering on HVAC fans and pumps, process fans and pumps, and other VFD applications as well as air compressors at commercial, industrial, and governmental facilities. The inspectors followed standard protocol for these measures, which was to either measure load current or true polyphase root-mean-square power using current transducers, watt-hour transducers, and handheld power meters. The Evaluation Team used the collected data to determine project-level realized energy (kWh) and demand savings (kW).

The Evaluation Team developed custom EM&V plans for many of the projects installing HVAC controls, HVAC VFDs, ventilation control/demand control ventilation, VFD compressors, heat-recovery systems, custom process, and large-scale lighting projects. Typically, senior engineers developed the EM&V plans and reviewed them with the field inspectors prior to the on-site inspection.

Table 190, Table 191, and Table 192 list abbreviated data collection EM&V plans for three of the most frequently evaluated measures from CY 2013.

Table 190. Sample Data Collection Content and EM&V Plan for VFD Process Pump

Topic Area	Typical Content in EM&V Plan for VFD Process Pump
Recommended EM&V Equipment	Appropriately-rated current transducers, watt-hour transducers, data loggers with external channel input, and handheld power meter.
Required Personal Protective Equipment (PPE)	Arc-rated face shield, coveralls, and balaclava with minimum arc rating of 8 cal/cm^2.
Metering Period/Logging Interval	Deploy loggers for a minimum of two weeks with a sampling interval of 30 seconds.
EM&V Instructions	Deploy current transducers on each leg of the three-phase supplying power to the VFD. Use Fluke power meter to measure voltage, amps, and power factor under all common loading conditions. Obtain copies of pump specifications and performance curves. Collect key parameters.
Key Parameters[1]	Manufacturer and model number, pump horsepower, motor efficiency, VFD efficiency, design gallons per minute (gpm), peak load (kW), baseline method of flow control, and load profile.

[1]Inspectors to gather key parameters for both new and baseline equipment.

Table 191. Sample Data Collection Content and EM&V Plan for VFD Air Compressor

Topic Area	Typical Content in EM&V Plan for VFD Air Compressor
Recommended EM&V Equipment	Appropriately-rated current transducers, watt-hour transducers, data loggers with external channel input, and handheld power meter.
Required PPE	Arc-rated face shield, coveralls, and balaclava with minimum arc rating of 8 cal/cm^2.
Metering Period/Logging Interval	Deploy loggers for a minimum of four weeks with a sampling interval of 30 seconds.
EM&V Instructions	Deploy current transducers on each leg of three-phase service supplying power to the VFD compressor. Use Fluke power meter to measure voltage, amps, and power factor under all common loading conditions. Obtain copies of compressor specifications and Compressed Air and Gas Institute (CAGI) data sheets. Collect key parameters.
Key Parameters[1]	Manufacturer and model number, compressor horsepower, rated pressure (per square inch gage), rated airflow (standard cubic feet per minute), kW at maximum load, method of flow control, compressor type, duty (primary, trim, back-up).

[1]Inspectors to gather key parameters for both new and baseline equipment.

Table 192. Sample Data Collection Content and EM&V Plan for Boiler Retrofit Project

Topic Area	Typical Content in EM&V Plan for Boiler Retrofit
General Questions	What months during the year does the boiler typically operate?
	Does the system operate year-round?
	Is the boiler used strictly for space heating or is it tied into the domestic hot water system?
	Are there any process loads on the boiler?
Eligibility Questions	Does the boiler meet minimum efficiency requirements?
	Is the combustion unit sealed?
	Is the firing rate modulated?
	Is the model prequalified or approved?
	Is this a back-up boiler?
	Is the rated heating input less than 5,000 MBtu/h?
Key Parameters[1]	Manufacturer and model number, input capacity (MBtu/h), output capacity (MBtu/h), Annual Fuel Utilization Efficiency (AFUE)/thermal efficiency, water temperature set point, heating system set points, and run-hours per year

[1]Inspectors to gather key parameters for both new and baseline equipment

Data Collection Activities/Process Evaluation

For CY 2013 data collection, the Evaluation Team focused on surveys of active customer participants and interviews with Trade Ally participants, representatives of customer energy teams, and Program actors. The percentage of respondents who answered questions, shown in tables and figures throughout the

report, may total to greater than 100% due to rounding or in cases where multiple responses are allowed. Multiple response questions are noted in the corresponding tables and figures.

Program Actors

Program actor interviews included staff from the Program Administrator and Program Implementer—including Energy Advisors and utility Key Account Managers.

Trade Allies

The Evaluation Team selected active Trade Allies from the CY 2013 Program project list, prioritizing the list by number of projects completed or project savings in CY 2013. The Evaluation Team invited Trade Allies from this list to attend the Program-wide Trade Ally focus groups and also selected four Trade Allies for individual interviews.

Customer Surveys

The Program processed 861 projects for 346 customers in CY 2013.[69] Forty-seven percent of the projects were prescriptive, 33% were hybrid, and 20% were custom.

The Evaluation Team stratified the projects in each category by the measures that represented the largest savings—boilers and burners, compressed air, HVAC, lighting, process, and other–and attached survey quotas for each measure (see Table 193). To expand the pool of projects containing custom components, customers who completed hybrid projects, were grouped with custom projects. The Evaluation Team called customers from each measure category until they filled the measure quota or exhausted the sample, attempting to survey an equal number of gas and electric customers.

Table 193. Customer Survey Sample Size by Measure

Measure Group	Projects[1]	Quota	Completed
Boilers and Burners	19	15	15
Compressed Air	82	13	13
HVAC	35	12	12
Lighting	59	9	10
Process	18	9	8
Other	16	2	2
Total	**229**	**60**	**60**

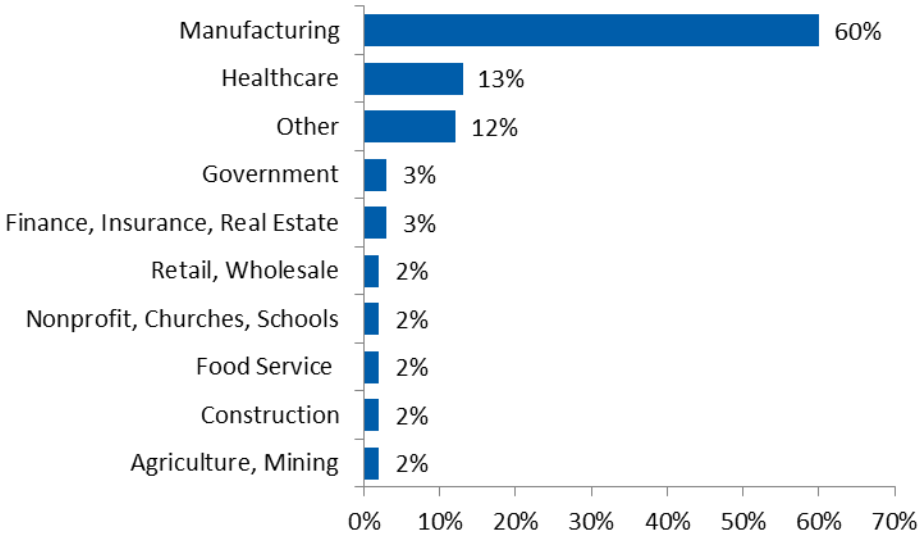
[1]Unique customer identification numbers by measure group, at time of sampling (8/23/2013).

[69] Data pulled from the Large Energy Users CY 2013 Program database on February 5, 2014. The Evaluation Team counted 861 projects (unique application identification numbers). The 861 unique application identification numbers represent a total of 1,412 measures.

Sixty percent of the customers surveyed were in manufacturing, 13% were in healthcare and the remaining 27% were from the sectors identified in Figure 152. Customers in the "other" category were from sectors such as architectural finishing, paper, printing/publishing, product testing, and fuels.

In comparison, the 346 customers who completed projects, represented the following sectors: 77% industrial (which included manufacturing), 21% commercial (which included hospitals), and the remaining 2% were from the schools, government, and agriculture sectors.

Figure 152. Distribution of Surveyed Customers by Business Sector



Source: Focus on Energy Business Programs—Large Energy Users
Participant Customer Survey CY 2013: QI1. "What industry is your company in?" (n=60)

For the 26 participants who reported that they had energy teams, the Evaluation Team asked additional questions about those teams.

Customer Energy Teams

The Energy Advisors provided the Evaluation Team, a list of customer energy teams. The list included 98 energy teams serving 72 companies.[70] These energy teams influence or make many of the energy decisions for their companies. The Energy Advisors support these teams with leadership and technical expertise.

The Evaluation Team conducted in-depth interviews with 10 of these energy teams, representing multiple business sectors and experience levels (from mature teams to teams formed within the last year).

[70] Large Energy User Energy Teams list dated July 1, 2013.

Impact Evaluation

To calculate gross savings, the Evaluation Team reviewed Program tracking data and data collected during participant phone surveys, in-person interviews, and on-site inspections. For prescriptive and hybrid measures, the Evaluation Team determined gross savings using the following two approaches:

- **Deemed Approach:** The Evaluation Team calculated project savings using assumptions from current work papers and Focus on Energy's 2010 Deemed Savings Manual, with some parameter adjustments based on findings from on-site inspections and customer interviews. The Evaluation Team made adjustments for the following circumstances:
  - Reported quantities did not match the verified quantities in the field.
  - Equipment specifications used in savings calculations, such as capacity and efficiency, did not match the specifications for the installed equipment.
  - The methodology used to stipulate savings for the Program was not transparent or there were apparent errors in savings calculations.
- **Verified Approach:** The Evaluation Team calculated project savings using data from on-site metering, on-site inspections, and interviews with customers, along with Program assumptions as necessary.

Evaluation of Gross Savings

This section describes how the Evaluation Team assessed gross savings for the Large Energy Users Program.

Tracking Database Review

The Evaluation Team reviewed the CY 2013 data in SPECTRUM (the Program database) for completeness and quality. The data were thorough and complete; SPECTRUM generally contained all of the data fields necessary to evaluate the Program. In general, the extent and quality of project documentation will increase with project complexity. The Evaluation Team consistently found supplemental documentation such as savings worksheets, calculations performed by participants or third-party contractors, energy audits, feasibility studies, product specifications, and invoices for equipment or contracting services in SPECTRUM for the hybrid and custom measures as well as some of the more complex prescriptive measures (e.g., compressed air, HVAC, and VFD).

The Evaluation Team found that application documents aligned with the applicant, facility, and measure-eligibility requirements. The Evaluation Team also found participant and third-party savings algorithms were appropriate.

Gross and Verified Gross Savings Analysis

The Evaluation Team used data from the project audits and on-site inspections to analyze each sampled project. Project analysis relied on standardized measure- or category-specific Excel-based calculators, which the Evaluation Team developed for the CY 2013 evaluation.

After determining verified savings for each project, the Evaluation Team calculated project-level realization rates and rolled up weighted average results to the measure level. The Evaluation Team multiplied measure-level gross savings by the corresponding measure-level realization rate to arrive at total verified gross savings (see Table 196).

In addition to data provided in project files, the Evaluation Team used deemed assumptions and algorithms to verify measure-level savings. The Evaluation Team developed the assumptions and algorithms using measure work papers and the 2010 Deemed Savings Manual for prescriptive and hybrid measures. For measures not explicitly addressed in a work paper or the 2010 Deemed Savings Manual, the Evaluation Team developed savings algorithms and assumptions based on engineering judgment and best practices from other statewide Technical Reference Manuals. Typically, the Program Implementer classified such measures as custom measures in SPECTRUM.

Also as a part of the CY 2013 evaluation, the Evaluation Team developed a list of key parameters for common measures offered through the Program and compared the evaluated values with the stipulated values used in work papers and the 2010 Deemed Savings Manual. Based on the findings of this analysis, the Evaluation Team assessed the validity of the stipulated values used to estimate savings. The following sections discuss the key findings from the analysis.

VFD Load Profiles

The Evaluation Team compiled the deemed load profiles used to estimate savings and the actual load profiles determined from evaluation activities into an Excel database for all sampled VFD projects. The Evaluation Team then compared deemed profiles to the evaluated profiles in order to assess the validity of the work paper assumptions from the Program Implementers. Table 194 and Table 195 list the deemed and evaluated values for the VFD projects.

Table 194. VFD Load Profile Comparison: Deemed vs. Actual (Evaluated)

Percentage of Load	VFD Application							
	HVAC Fan (n=22)		CW Pump (n=4)		Process Fan (n=12)		Process Pump (n=35)	
	Deemed	Actual	Deemed	Actual	Deemed	Actual	Deemed	Actual
100%	-	-	62.8%	-	12.2%	9.5%	6.8%	6.6%
90%	5.0%	0.3%	-	6.0%	25.0%	16.6%	12.0%	21.9%
80%	-	2.5%	-	1.4%	25.0%	16.6%	17.4%	14.3%
70%	25.0%	8.5%	37.2%	21.4%	25.0%	39.6%	21.2%	20.7%
60%	-	8.2%	-	6.3%	12.8%	8.7%	18.3%	13.6%
50%	40.0%	13.1%	-	14.0%	-	1.1%	12.9%	8.0%
40%	30.0%	32.8%	-	26.9%	-	1.8%	7.5%	6.8%
30%	-	6.2%	-	23.9%	-	2.6%	3.9%	6.3%
20%	-	28.3%	-	-	-	3.3%	-	1.8%

Table 195. Comparison of Deemed vs. Actual Values for Evaluated VFD Projects

VFD Application	Deemed			Actual		
	Avg. Run-Hours	Avg. % Load	Avg. EFLH	Avg. Run-Hours	Avg. % Load	Avg. EFLH
HVAC Fan	5,224	54.0%	2,821	4,437	40.4%	1,791
Chilled Water Distribution Pump	5,880	54.0%	3,175	7,551	50.3%	3,795
Process Fan	6,494	79.9%	5,186	6,031	73.5%	4,433
Process Pump	5,752	68.0%	3,911	5,490	69.4%	3,808

As illustrated by the findings, the deemed load profiles used by the Program for VFD chilled water pumps, process fans, and process pumps were reasonably accurate and appropriately conservative.

Realization Rates

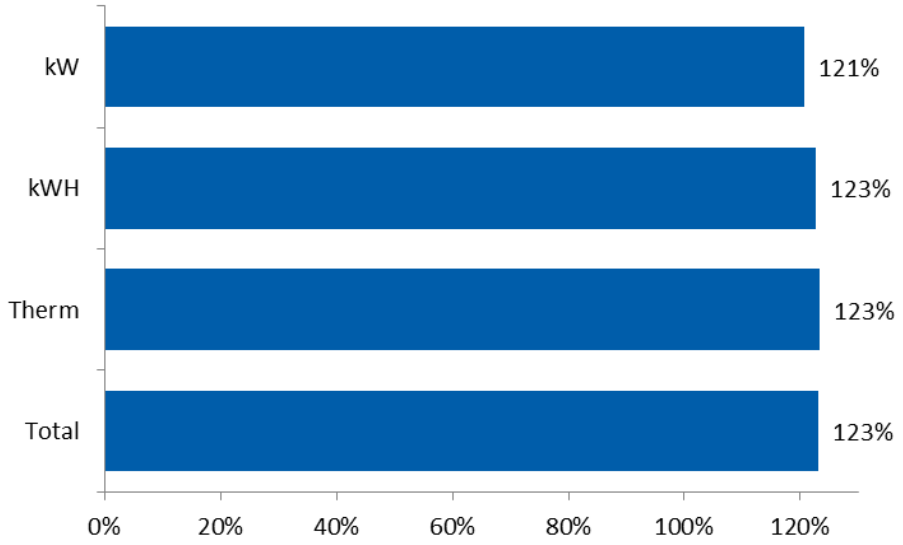
Overall, the Program achieved an evaluated realization rate of 123%, as shown in Table 196. Thus, the Evaluation Team verified that the Program achieved and exceeded the gross savings reported in SPECTRUM.

Table 196. Large Energy Users Program Realization Rates by Measure Group

Measure Group	Realization Rate			
	kWh	kW	Therms	MMBtu
Boilers and Burners	100%	110%	100%	100%
Compressed Air	169%	152%	149%	162%
HVAC	72%	83%	153%	137%
Lighting	172%	148%	N/A	172%
Process	97%	107%	98%	98%
Total	**123%**	**121%**	**123%**	**123%**

Figure 153 shows the realization rate by fuel type.

Figure 153. Large Energy Users Program Realization Rate by Fuel Type



Summary of Gross and Verified Gross Savings

To calculate the total verified gross savings, the Evaluation Team applied measure-level realization rates to the savings of each measure group. Savings listed as current pertain to projects approved and completed under the current Large Energy Users Program, whereas savings listed as carryover pertain to projects approved under the legacy programs but completed after the new Program launched in April 2012. The new Program includes two components called the Emerging Technology Program and the Renewable Energy Competitive Incentive Program,[71] which are tracked as independent line items. Table 197 lists the reported and verified gross savings, by measure type, achieved by the Program in CY 2013.

Table 197. Large Energy Users Program Gross Savings Summary

Project Type	Reported Gross			Verified Gross		
	kWh	kW	Therms	kWh	kW	Therms
Annual Savings						
Current	100,978,475	13,143	6,930,112	123,884,115	15,868	8,547,936
Carryover	13,386,977	1,548	915,375	14,960,099	1,680	1,106,782
Total Annual	**114,365,452**	**14,691**	**7,845,487**	**138,844,214**	**17,549**	**9,654,718**
Life-Cycle Savings						
Current	1,354,876,528	13,143	100,537,256	1,563,420,404	15,868	124,103,412
Carryover	162,071,029	1,548	12,938,262	178,774,821	1,680	15,255,575
Total Life-Cycle	**1,516,947,557**	**14,691**	**113,475,518**	**1,742,195,225**	**17,549**	**139,358,987**

[71] A separate chapter details the Renewable Energy Competitive Incentive Program.

Evaluation of Net Savings

This section describes how the Evaluation Team assessed net savings for the Large Energy Users Program.

Net-to-Gross Analysis

This section provides findings and commentary specific to the Business Incentive Program. For a detailed description of net-to-gross analysis methodology, please refer to Appendix L.

Freeridership Findings

The Evaluation Team used the self-report and standard market practice approaches to determine the Program's freeridership level. Table 198 identifies the freeridership approach the Evaluation Team applied to each measure type.

Table 198. Large Energy Users Program Freeridership Estimation Approach by Measure Group

Freeridership Estimation Approach	Measure Group
Self-Report and Standard Market Practice	Boilers & Burners Lighting
Self-Report	Agriculture Building Shell Compressed Air, Vacuum Pumps Domestic Hot Water Food Service Industrial Ovens and Furnaces Information Technology Laundry Motors & Drives Pools Process Refrigeration Renewable Energy Training & Special Vending & Plug Loads Waste Water Treatment HVAC

Self-Report Freeridership Estimates

The Program had average self-report freeridership of 27% in CY 2013. This freeridership rate represents a 21-percentage point increase from CY 2012, when the Program had a weighted average self-report freeridership rate of 6%. Compared with CY 2012 survey respondents, CY 2013 respondents were more likely to be 100% freeriders, and less likely to be 0% freeriders.

The Evaluation Team analyzed freeridership by project size in CY 2012 and CY 2013. The Evaluation Team determined that freeridership for the largest projects in the survey sample increased significantly from year to year. In CY 2012, the three respondents with the highest gross energy savings accounted for 46% of the survey sample's total gross savings, and all three respondents were 0% freeriders. In CY

2013, the three respondents who achieved the greatest savings accounted for 21% of the total gross savings for the survey sample, and one of the top three energy savers was a 50% freerider.

Standard Market Practice Freeridership Estimates

The Evaluation Team used standard market practice data to estimate freeridership for selected measures in two measure groups: Lighting and Boilers & Burners. Table 199 shows the standard market practice freeridership value for each group.

Table 199. Large Energy Users Program Standard Market Practice Freeridership Estimates by Measure Group

Measure Group	Standard Market Practice Freeridership Estimate
Boilers & Burners	30.0%
Lighting	80.8%

Overall Freeridership Estimate

By combining the self-report and standard market practice freeridership data, the Evaluation Team estimated that the Large Energy Users Program had overall average freeridership of 28% in CY 2013.

Spillover Findings

The Evaluation Team estimated participant spillover based on self-report survey data. Table 200 shows the spillover measures customers said they installed as a result of their program participation.

Table 200. Large Energy Users Program CY 2013 Spillover Measures

Measure Name	Quantity	Per-Unit Btu Savings	Total Btu Savings
LED Lighting	70	1,525,227	106,765,912
Fluorescent Tube Lighting	540	634,848	342,817,870
High Efficiency Motor	27	4,016,091	108,434,449
Canopy Lighting	14	496,223	6,947,120
Steam Trap	107	2,612,460	279,533,257
Total	**758**		**844,498,608**

The Evaluation Team estimated spillover as 2% of Program savings, which represents an increase from 0% in CY 2012.

Net-to-Gross Ratio

The Evaluation Team calculated an overall Business Incentive Program net-to-gross estimate of 74%, as Table 201 shows.

Table 201. CY 2013 Large Energy Users Program Freeridership, Spillover, and Net-to-Gross Estimates

Measure Type	Freeridership	Spillover	Net-to-Gross
Overall	28%	2%	74%

[1] The Evaluation Team weighted the overall value by the distribution of evaluated gross energy savings for the

Program population.

The Program's net-to-gross ratio declined by 20 percentage points from 94% in CY 2012. The Evaluation Team determined freeridership increased largely because of the increase in reported freeridership from some of the largest participants in CY2013. Although spillover also increased, as described above, this increase was not sufficient to offset the increase in freeridership.

Finally, it should be noted that the participant survey sample sizes were larger in CY 2013 (n=59) than in CY 2012 (n=22), which means that the two years' results have different levels of confidence and precision. For detailed information on confidence and precision, please refer to Appendix K.

It is important to note that the CY 2012 net-to-gross estimate was noticeably higher than prior findings in Wisconsin. As the Evaluation Team noted in the CY 2012 evaluation report, the net-to-gross ratio prior to the CY 2012 evaluation was 0.6 for lighting measures and 0.45 for HVAC.[72] The CY 2013 net-to-gross analysis results more closely align with estimates prior to the CY 2012 evaluation.

Net Savings Results

Table 36 shows the net energy impacts (kWh, kW, and therms) for the Program. The Evaluation Team attributed these savings net of what would have occurred without the Program.

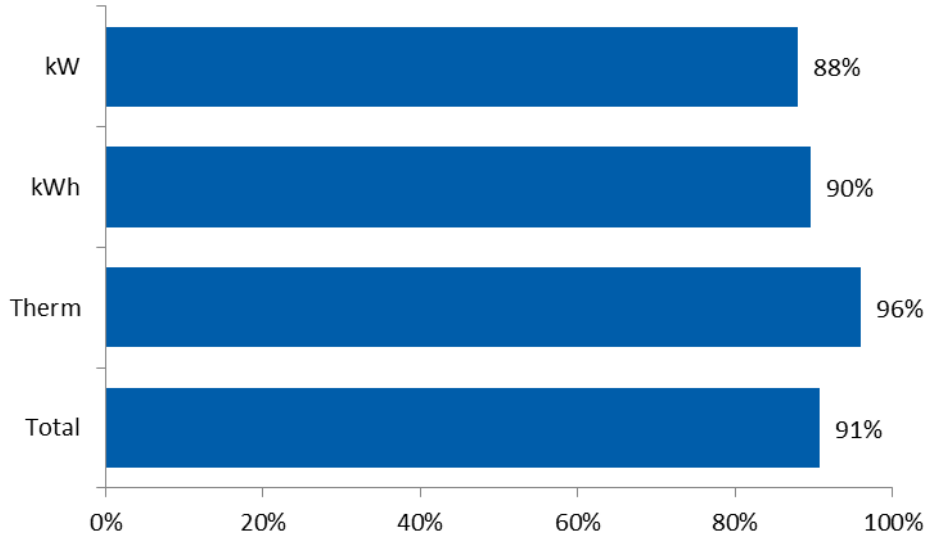
Table 202. CY 2013 Large Energy Users Program Net Savings

Project Type	Savings Type	Verified Net		
		kWh	kW	Therms
Current Program	Annual	87,517,333	11,244	6,418,933
	Life-cycle	1,076,963,808	11,244	90,516,024
Carryover Projects from Legacy Programs	Annual	14,960,099	1,680	1,106,782
	Life-cycle	178,774,821	1,680	15,255,575
Total Savings	**Annual**	**102,477,432**	**12,924**	**7,525,715**
	Life-cycle	**1,255,738,629**	**12,924**	**105,771,599**

Figure 154 shows the net savings as a percentage of the *ex ante* gross savings by fuel type.

[72] The Evaluation Team based the stipulated net-to-gross ratios used in CY 2011 upon the results of the CY 2010 evaluation.

Figure 154. Large Energy Users Program Net Savings as a Percentage of *Ex Ante* Savings by Fuel Type



Process Evaluation

In this evaluation, the Evaluation Team also reviewed the progress made on the following issues identified in the CY 2012 process evaluation:

- Communication between Energy Advisors and utility Key Account Managers.
- The shortage of Energy Advisors and technical staff.
- Frequent Program changes and turnover of the Energy Advisors between customer accounts.
- Energy Advisors' workloads.
- The need to provide Energy Advisors, Key Account Managers, and Trade Allies with advance notice of Program changes.

Program Design, History, and Goals

Launched in April 2012, the Program offers prescriptive and custom incentives to customers whose facilities meet the following criteria.

- Have an energy demand of at least 1,000 kilowatts of electricity per month, or
- Use at least 10,000 decatherms of natural gas per month, and
- Within any month in the previous 12 months, the customer is billed at least $60,000 for electric service, natural gas service, or both, for all of the customer's facilities within the energy utility's service territory.

In CY 2013, the Program Administrator and Program Implementer adjusted the Program design to capture more savings and respond to customers' requests for a greater selection of prescriptive equipment (particularly LED lighting) and additional technical support from the Energy Advisors.

Program Changes

Program design changes included:

- Expanding the list of equipment eligible for prescriptive incentives.
- Raising the custom project cap to 50% of total project cost or a maximum of $200,000 per custom project.
- Expanding the maximum simple payback limit, for eligible custom projects, from four to 10 years.
- Implementing bonus incentives for therm reduction as well as steam trap survey and repair.
- Offering Trade Allies an incentive to identify and install projects with less than one and half years payback.
- Implementing a Healthcare Network Strategic Energy Management initiative. The initiative offers a bonus to healthcare customers who install common energy-efficiency measures across their multiple facilities.

The Program offered a therm bonus to offset the low cost of natural gas in the market. The Program Implementer, Energy Advisors, and utility Key Account Managers cited low natural gas prices as the "number one reason" customers are not focused on projects reducing natural gas usage.

The Program Administrator also made changes to the website to improve the customer's experience and reduce confusion between information for the custom and prescriptive measures.

Program Management and Delivery

The Program Administrator and Program Implementer share the day-to-day operation of the Program. In May 2013, the Program Administrator assigned a new lead who brought extensive experience in consulting, industrial wastewater, industrial manufacturing processes, and design and construction of utility-scale renewable energy.

The Program Implementer manages delivery of the Program with help from an experienced team of managers, Energy Advisors, and technical experts with experience in large commercial and industrial facilities. The Program Implementer, along with support from utility Key Account Managers and industry Trade Allies, provides customers with technical information and assistance.

Management and Delivery Structure

All Focus on Energy programs share the same Program Administrator. The Program has three customer-facing groups: Trade Allies, the Implementer's Energy Advisors, and the utilities' Key Account Managers. Figure 155 shows a diagram of the key actors in the Large Energy Users Program.

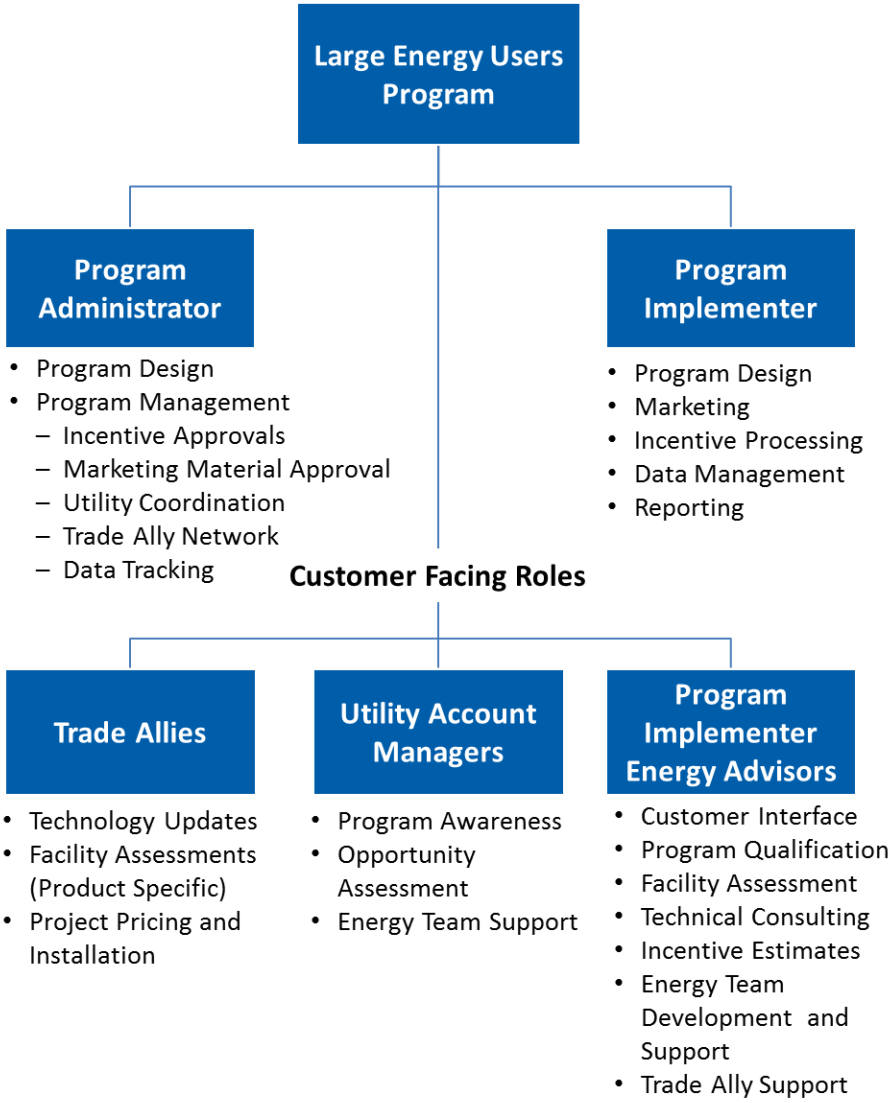
The Program Administrator and Program Implementer took steps in CY 2013 to address opportunities to improve operations identified in the CY 2012 Program evaluation. These steps included:

- Improving communication with utility Key Account Managers.
  - In CY 2012, utility Key Account Managers reported they were not fully engaged with the Program and communication with Focus on Energy representatives was difficult. In CY 2013, the Program Administrator, Program Implementer, and Key Account Manager supervisors conducted several formal meetings to discuss Program issues. The Key Account Managers said communication had improved significantly due to those meetings, particularly in sharing the leadership and training of the customer energy teams.
- Providing additional Energy Advisors, technical staff, and resources.
  - In late CY 2012 and early CY 2013, the Program Implementer added two new Energy Advisors, moved one existing employee into the field as an Energy Advisor, and added two technical staff (focused on lighting and the steam systems, boilers, and heating systems).

However, feedback gathered by the Evaluation Team during the CY 2013 evaluation indicated that Program participants were still frustrated with the limited availability of Energy Advisors. Specific concerns included:

- Customers, Trade Allies, and utility Key Account Managers found it difficult to keep up with frequent Program changes and turnover of the Energy Advisors between customer accounts.
- Customers and Trade Allies reported the Energy Advisors were still significantly overloaded with work, which reduced their availability and increased response time.

Figure 155. Large Energy Users Program Key Program Actors and Roles



Program Data Management and Reporting

When asked about SPECTRUM's system functionality in CY 2013, Program actors gave mixed responses. Most respondents said they were receiving Program summary reports more regularly, but the reports did not provide the detailed information necessary to track individual projects through the pipeline. Some reported "giving up" on SPECTRUM and creating alternative project-tracking spreadsheets. Energy Advisors and utility Key Account Managers most frequently reported the project pipeline tracking was a concern and suggested these improvements:

- Track project-specific data in addition to the available Program summary data.
- Provide easier access to manipulate and update project information without having to input a username and password repeatedly to view each document associated with a single customer.

> One Energy Advisor said, "I should be able to hit a button and see all of my accounts, what projects are associated, [and] where I am with the Program goals. It [SPECTRUM] was supposed to be a CRM program. I can't do that with one quick keystroke. I have to go to each customer, go to multiple webpages, then try to get to the right facility. It's very cumbersome [and time consuming]."

Implementer staff said they encountered a number of challenges when Focus on Energy transitioned from annual to life-cycle energy savings targets for programs in CY 2013 and this delayed processing some of the projects. Implementer staff reported the following challenges with the transition:

- Difficulty reconciling differences between values embedded in SPECTRUM and those in the Program cost-effectiveness calculator.
- Determining the expected useful life (EUL) values for custom and hybrid measures (both are common Program measures).
- Challenges determining EUL values and recalculating these values for projects already in the Program database (January through April 2013).

At the time of the interview, the Program Administrator and Program Implementer were working to resolve these issues.

Database

Forty-one percent of the application entries (for both custom and prescriptive measures) did not include Trade Ally company names and contact information. This resulted in a smaller Trade Ally sample pool for the Trade Ally surveys and focus groups. It also limited the Evaluation Team's ability to assess Trade Ally involvement based on volume of applications.

Nineteen percent of custom applications entries did not show an "application received" date; this meant the Evaluation Team could not calculate how much time had elapsed from the time the Program Implementer received the application and preapproved it.

Program Materials

The Evaluation Team completed a full materials review for the CY 2012 Program evaluation. Since then, the Program Implementer:

- Revised the operations manual in October 2013. The updates documented operations protocols, staffing, and Program goals in detail. Additionally, the revised manual contains complete appendices or references to relevant appendix locations on Focus on Energy's SharePoint site.
- Developed a detailed and complete CY 2014 marketing plan (draft) and a CY 2014 Trade Ally management plan.

Marketing and Outreach

In CY 2013, the Program Implementer primarily marketed the Program to customers through Energy Advisors (with support from Trade Allies and utility Key Accounts Managers). Implementer staff also conducted outreach activities through mail, e-mails, newsletters, workshops, and the Program website.

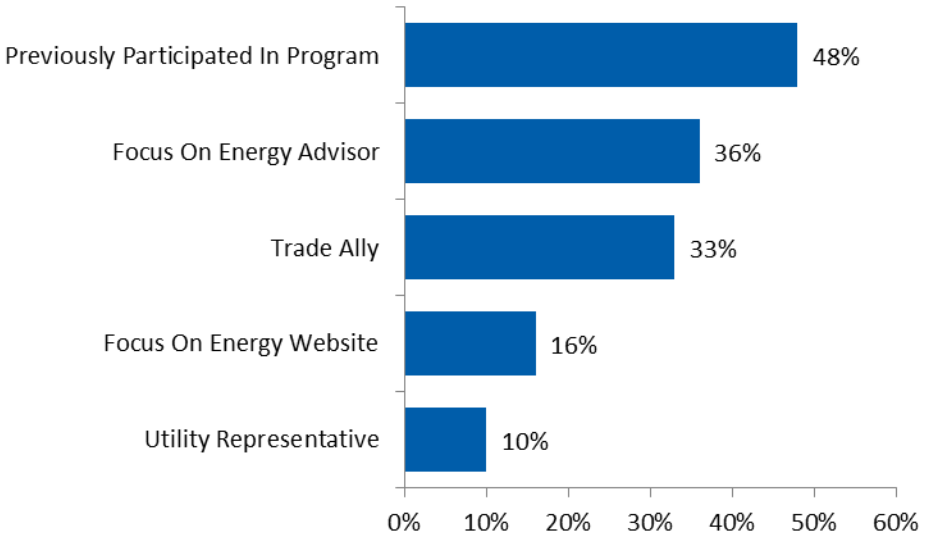
During the CY 2013 surveys and interviews, customers reported they had developed greater awareness about the need for energy-efficiency and wider sustainability efforts, something customers did not mention in CY 2012. For example, one customer said, "[Efficiency] is becoming more of an issue that we do look at it, that we do make sure our equipment is energy efficient, and that's changed over the last five years. Before, we weren't as concerned about it."

Customer Outreach

Surveys and interviews with customers, Trade Allies, and Focus on Energy staff in CY 2013 revealed they were more familiar with the Program than in CY 2012. However, Implementer staff said that customers do not usually know if they best qualify for the Business Incentive Program or the Large Energy Users Program. Customers reported that they relied on the Energy Advisors to help them determine the best program to participate in, but this reliance did not appear to be a barrier to customer participation.

In CY 2013, customers most frequently reported they know about Program incentives because they had previously participated in the Program. Figure 156 shows the Energy Advisors and Trade Allies were also key resources for information. Customers also reported going to the website for incentive information more in CY 2013 than in CY 2012.

Figure 156. How Customers Learned About the Incentives

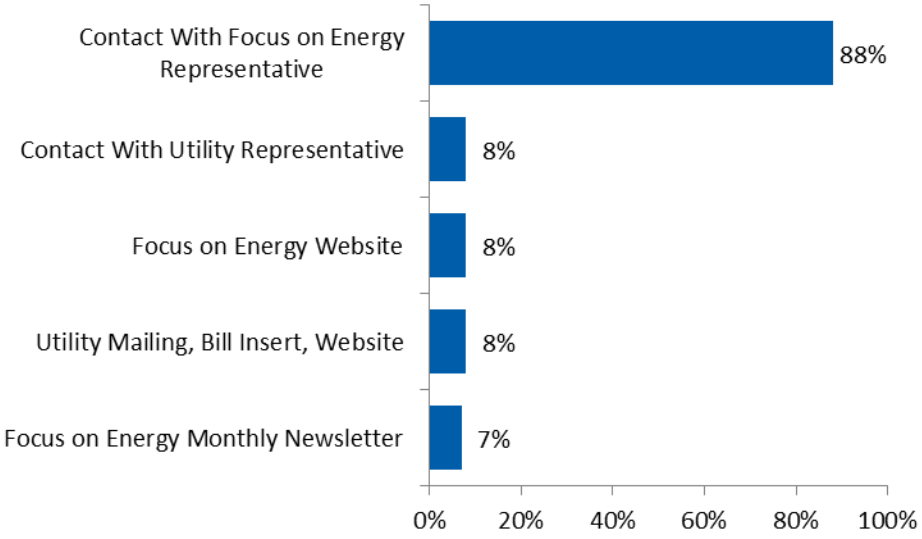


Source: Focus on Energy Business Programs—Large Energy Users Participant Customer Survey CY 2013: QB2: "How did your organization learn about the incentives available for this project from Focus on Energy?" (n=58; (multiple responses allowed))

When asked how they liked to stay informed about the Program, most Large Energy User Program participants said they preferred person-to-person contact and few cited mass marketing approaches. Almost all respondents (88%) said they relied on personal phone calls from their Energy Advisor to stay informed (see Figure 157).

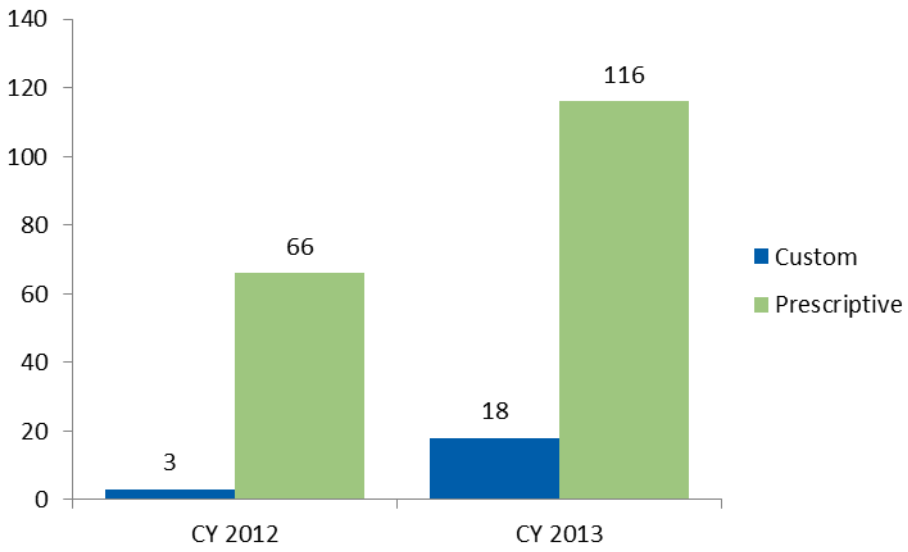
In CY 2013, the Program Implementer increased outreach efforts targeted at the healthcare sector, launching a healthcare network initiative. Healthcare projects represented 15% of total projects (861) in CY 2013, and 18% of total projects (382) in CY 2012 (Figure 158).

Figure 157. Preferred Source of Future Information



Source: Focus on Energy Business Programs—Large Energy Users Participant Customer Survey CY 2013: QJ1: "In the future, how would you like to stay informed about opportunities to save energy and money?" (n=60; (multiple responses allowed))

Figure 158. Healthcare Projects by Year



Source: Targeted Markets Complete-Nexant (extract dated) March 18, 2013. Targeted Markets Database Complete, (extract dated) January 6, 2014

The Program Implementer also partnered with Wisconsin Department of Natural Resources and created a factsheet that promotes water and wastewater efficiency to Wisconsin municipal utilities. For all other customers, the Program Implementer continued using the CY 2012 marketing strategy of direct contact, delivered through the Energy Advisors, with support from utility Key Account Managers and Trade Allies.

Outreach to Trade Allies

Trade Allies said they received information about the Program through the Focus on Energy newsletter, e-mails, the website, and direct contact with the Energy Advisors. Surveyed Trade Allies preferred not to receive general Focus on Energy advertisements or other information not specific to the Program.

Trade Allies gave mixed feedback about the effectiveness of Program's Trade Ally outreach activities. Trade Allies, Key Account Managers, and Energy Advisors said they received Program updates at the same time customers did. They also said this could be awkward or embarrassing if customers asked about Program changes they did not know about. For instance, the majority of the Trade Allies said they were unaware of bonus programs such as the $0.40 therm bonus or the incentive to drive projects with less than a one-and-a-half year payback.

Respondents asked to be informed in advance of the customers about special offers. They also suggested that Focus on Energy send a single weekly or monthly e-mail that provides key Program updates such as bonuses and changes in incentives.

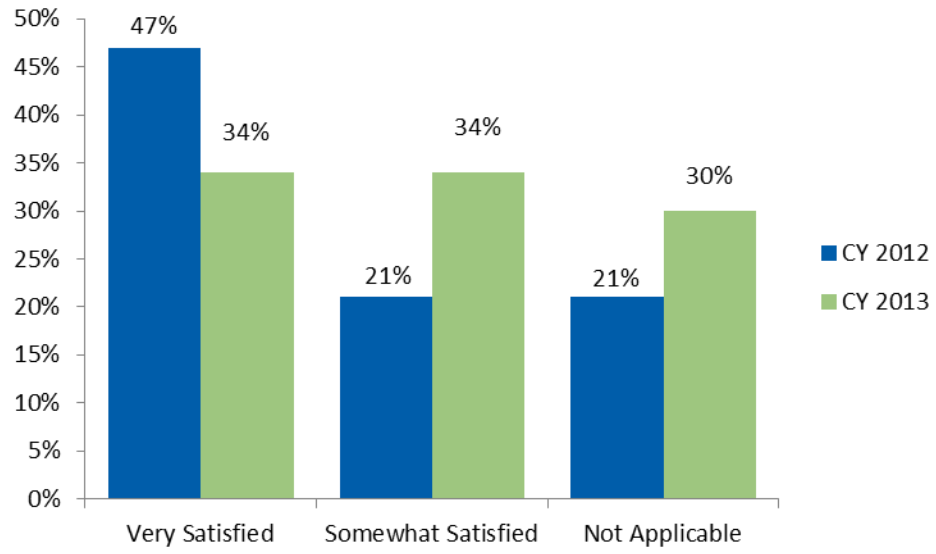
The CY 2013 Program operations manual describes a designated Trade Ally liaison to disseminate Program information and to support Trade Allies. The Evaluation Team did not interview the Trade Allies

about having a liaison and the Trade Allies did not mention this topic, but one Trade Ally said he would like to have a representative the way customers do.

Program Website

Surveyed customers reported mixed satisfaction with the website, and satisfaction levels dropped from CY 2012, as shown in Figure 159. As customers responded to the survey shortly after an initial website redesign, the Evaluation Team was not able to confirm whether the customer referred to an older version of the website. Thirty-four percent of the customers said they were "very satisfied" with the website in CY 2013 compared to 47% in CY 2012. Twenty-eight percent of customers said the question was "not applicable," meaning they did not use the website regularly. This drop in high satisfaction levels may be related to more customers using the website this year.

Figure 159. Customer Satisfaction with Website Year over Year



Source: Large Energy User Customer Survey Frequencies CY 2012 (n=19) and CY 2013 (n=56)

Some customers said they were familiar with the website and could find the forms and information they needed; but other customers said the site was still somewhat cluttered and hard to navigate. Some customers reported the information was vague and incomplete and that they still needed to speak to a person to fully understand details such as equipment eligibility. Implementer staff also said that customers do not understand the jargon used on the website.

One utility Key Account Manager described sending an e-mail to customers with links to Focus on Energy training. He said, "Without the links, customers cannot find anything." One customer recommended adding a searchable equipment list to the website so users could easily and quickly determine the eligibility and incentives for products they are considering.

Customers also had access to a tool on the Focus on Energy website called Find-a-Trade Ally. The four Trade Allies interviewed said they had not acquired any customers through the website tool and customers did not mention it by name.

Three of the four Trade Allies interviewed said they were "very satisfied" with the website. One Trade Ally said he was "somewhat satisfied" with the website. The Trade Ally who was "somewhat satisfied" said he reviewed the Find-a-Trade Ally search tool, and he preferred a past Focus on Energy website that ranked Trade Allies by number of projects completed. He said it was more useful to the customers. He also said that Trade Allies listed themselves in more counties than they actually worked in to get more leads.

The Trade Allies also said they want direct access to qualified equipment lists, incentives, and application forms without clicking through multiple web pages.

Customer Energy Management Teams

The Evaluation Team conducted in-depth interviews with 10 energy teams selected from a list of teams the Energy Advisors provided. For the 26 customers who reported (during the general customer survey) that their companies had energy teams, the Evaluation Team also asked a series of questions about those teams. This section presents responses from both of these groups. When it adds value, results from each group are reported separately.

The Program Implementer worked with customers in both CY 2012 and CY 2013 to develop and train new energy teams and support existing energy teams. Customers said these teams influenced many corporate energy decisions (see Figure 160). Energy Advisors reported they worked with the teams to develop technical expertise, identify energy-efficiency opportunities at their facilities, and create strategic energy management plans.

The Evaluation Team asked 35 customers if they had formed their energy team as a result of participating in the Program. Fourteen customers said "yes," and 21 said "no."

However, two of the customers who reported that they did not form their teams as a result of participation in the Program also said the Program was important to sustaining their teams over time.

Energy Management Team Structure

The energy teams varied widely in their size and membership. Some teams included one to two people who were responsible for one location. Other customers with multiple sites had teams at each site. Still other customers reported having smaller satellite teams at remote locations that operated independently or had remote team members participate virtually with the core team. Energy team members typically came from facilities and plant operations, but also included staff from other areas such as finance, health and safety, sustainability and environmental services, and executive management. Many team members participated on a voluntary basis, and all had other primary jobs within their companies.

Energy Advisors and utility Key Account Managers said they worked with these teams in various capacities, depending on the teams' needs. Some teams functioned independently, and the Energy Advisors provided periodic support and education. Energy Advisors also led, trained, and supported other energy teams not ready to function independently. Customers also invited Trade Allies to attend meetings as needed to discuss projects.

Energy Team Goals and Challenges

When asked about energy team goals during the 10 in-depth energy team interviews, respondents said their goals were to make their companies more competitive and better environmental stewards. These teams worked to increase energy efficiency through the evaluation of energy use, identification of efficiency opportunities, and implementation of projects and long-term energy strategies. Some energy teams worked more broadly to identify and implement corporate sustainability practices.

When asked if they had formal strategic energy management plans in place, members from one energy team said they had an approved formal plan, and two other teams had draft plans in development. The remaining seven teams had a variety of strategies—from energy and cost-reduction goals (formal and informal) to operating guidelines and mission statements. Members from nine of the 10 teams reported they were very active and aggressively working through their facilities to implement energy- and cost-reduction projects.

When asked what the biggest challenges were to making energy-efficient improvements in their companies, respondents listed the following three issues:

- Time to identify and pursue opportunities
- Employee buy-in
- Funding

Several of the energy team managers correlated team success with the team's ability to educate and engage the employees, including facilities' management staff, employees working on the manufacturing floor, and their managers. The energy managers reported that as the employees' awareness grew, and they saw successful energy projects implemented, the employees began to consider their own facilities' energy uses and costs. Employees were more interested in identifying efficiency opportunities, and one customer reported friendly competitions to reduce energy and increase savings sprang up between facilities.

Energy Advisors and customers said that energy teams that do not have internal leadership and executive support will likely dissolve over time. The structure, technical support, and training from Focus on Energy and the utilities supplement these teams' limited internal resources. For companies that completed the most common energy-efficiency retrofits, such as lighting and motors, team members reported they look each year to the Energy Advisors for a steady flow of new ideas to meet corporate energy and cost-reduction goals.

Overall, the energy team members requested the following changes to the Program:

- Higher incentives for more items (for example, replacement of old, inefficient motors that have not yet failed).
- Examples that benchmark the savings other energy teams achieve to help justify a full-time staffing position.
- More case studies of successful projects from other Wisconsin companies.
- Energy Advisors meet with executives and plant personnel to raise awareness of and quantify opportunities.
- Simpler programs and quicker preapprovals and payments from Focus on Energy.
- Training for facility and operations staffs so that savings achieved are not compromised in day-to-day operations of equipment and processes.

Services Provided by Energy Teams

The majority (67%) of the 26 customers identified through the survey as having energy teams reported that they found the services of the teams "very valuable" to their companies.

These same customers indicated which of 12 services their Energy teams provided, as shown in Table 203. The results show that that the teams provided many similar services: obtaining executive support and funding for projects; encouraging employee behavior change; identifying and monitoring projects; and verifying energy savings. Fewer teams were involved with activities such as developing corporate energy use policies, reviewing bids, overseeing installations, and evaluating corporate sustainability.

Table 203. Services Provided by Energy Teams

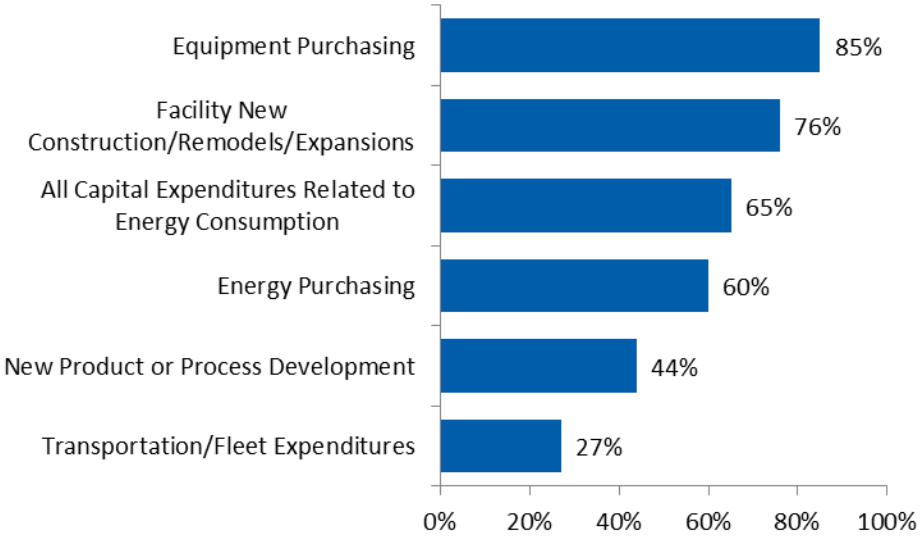
Service	Percentage of Teams
Obtain executive support for projects	100%
Encourage employee behaviors that reduce energy use	96%
Evaluate process energy use such as heat recovery or refrigeration	96%
Monitor building energy use such as lighting or HVAC	96%
Identify energy-efficiency project opportunities	96%
Calculate projected savings	96%
Verify energy savings	92%
Obtain corporate funding for projects	88%
Develop corporate energy use policies and procedures	77%
Review bids from Trade Allies	77%
Oversee project installation	69%
Evaluate corporate sustainability such as greenhouse gas emissions, carbon footprint reporting transportation, or fleet purchases	56%

Source: Focus on Energy Business Programs—Large Energy Users Participant Customer Survey CY 2013: QC11: "What services does your energy team provide? Do they…" (n=≥25)

Energy Team Influence

The 26 customers surveyed told the Evaluation Team that their energy team exerted influence on many different corporate energy decisions (see Figure 160). These customers said they primarily influenced decisions about equipment purchases, new construction, or facility remodels. Some energy teams reported influencing all capital expenditures. Interestingly, although the energy teams evaluate process energy use, more than one half of the energy teams said they did not influence new product or process development and that the product manufacturing group controls these functions.

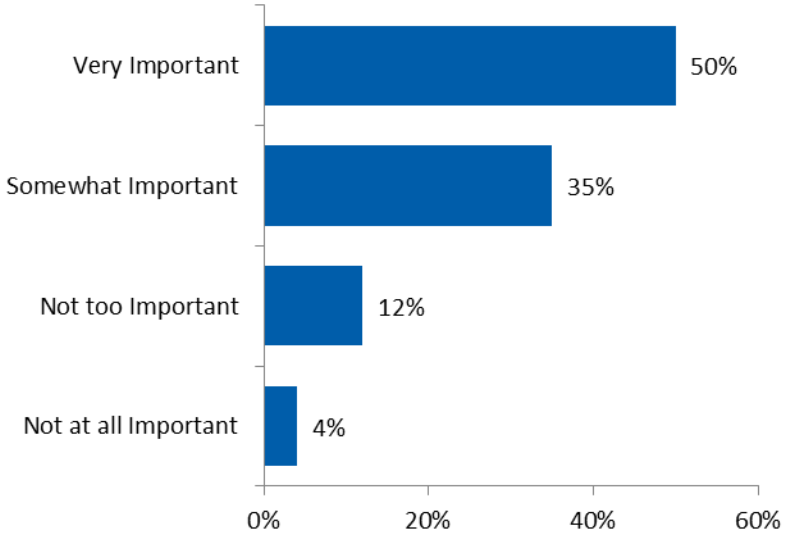
Figure 160. Areas of Influence



Source: Focus on Energy Business Programs – Large Energy Users Participant Customer Survey CY 2013:
QC12: "Which corporate decisions does your energy team influence? Do they influence …"
(n=≥22; (multiple responses allowed))

Fifty percent of customers with energy teams said those teams were very important in their decision to make the energy-efficient upgrades discussed in the survey (see Figure 161).

Figure 161. Importance of Energy Team in Energy Upgrade Decision



Source: Focus on Energy Business Programs—Large Energy Users Participant Customer Survey CY 2013: QC10: "How important was the energy team in your decision to make these energy-efficient upgrades?" (n=26)

Table 204 lists how customers rated of the value of the energy team services and compares those ratings to the importance of these energy teams in decision-making. The results indicate that customers also perceived that the teams influence energy decisions within their companies.

Table 204. Comparison of Energy Team's Value vs. Importance

Response	Value of Services Provided By Energy Teams	Energy Teams' Importance In Energy Decisions
Very/Somewhat	100%	85%
Not Too/Not At All	-	16%

Energy Team Satisfaction

Of 36 surveyed customer with energy teams, 64% of the respondents said they were "very satisfied" with Energy Advisor support for their teams.

Customers also said they liked their Energy Advisor's communication, responsiveness, and technical knowledge and the case studies provided to their teams. Customers said they were less satisfied with the prescriptive application forms, which they said were long and confusing, and that content on the website needed additional explanation.

Members from two energy teams said service had declined since the Program began and that the availability and technical knowledge of the Energy Advisors had decreased.

Customers had mixed opinions about the training that Focus on Energy and the Energy Advisors provided to their Energy Teams. Some said the applicability could be hit-or-miss, but others said they attended seminars and could apply the content right away. These customers specifically named the building operator training, "energy-related webinars," and practical energy-management seminars as valuable.

Several customers requested that Focus on Energy extend the training to maintenance personnel and managers, not just the engineering staff.

Barriers to Forming an Energy Team

Customers without energy teams reported that lack of staff or time were the biggest challenges to forming a team. However, customer responses revealed many of them did not understand the benefits an energy team can provide.

Customer Experience

Many of the large energy users operate multiple facilities across Wisconsin, the country, or the world. These facilities may be a single building or a campus of buildings and they range in size from 800 to more than 3,200,000 square feet. Ninety-three percent of these customers own their facilities and employ from three to 5,000 people.

Because many of these customers are manufacturers or operate facilities like hospital campuses (open 24 hours per day), the facility and engineering staffs are primarily focused on keeping the facilities and process operations running. Many customers do not have sufficient staff or resources to analyze energy projects, and they have concerns about the undesirable impacts a project may have on production, product quality, or employee satisfaction.

Given these demands, customers still implemented 861 projects in CY 2013 and reported much less confusion with the Program than they reported in CY 2012. Customers said the communication and support from Focus on Energy was working well this year and several used the words "fine" and "excellent" when stating their opinions of the Program.

However, customers also encountered delays and obstacles during their participation, many of which were also obstacles in CY 2012. Although the overall customer satisfaction rating with the Program remained consistent from CY 2012 to CY 2013, the Evaluation Team observed statistically significant declines in satisfaction in several areas, which may indicate that customers perceive the need for improvement. Table 205 and Table 206 list details from the customer satisfaction ratings.

Satisfaction

Of the 60 customers surveyed, 77% said they were "very satisfied" with their overall project experience. Satisfaction was highest with these five components, all of which received 65% very satisfied ratings or more and virtually no negative ratings:

- Expertise provided by the Energy Advisors (83% very satisfied)
- Overall experience with the project (77% very satisfied)
- Communication with Focus on Energy representatives (70% very satisfied)
- Expertise provided by other Program staff (69% very satisfied)
- Experience with Trade Allies (66% very satisfied)

Two customers, who said they were somewhat satisfied with the expertise provided by the Energy Advisors, said not all Energy Advisors had the same level of expertise and several did not have expertise specific to the industry the customer operated in. One example cited by several customers, was a lack of knowledge about compressed air capacitance.

Satisfaction remained low or declined further with the project application and payment processes, incentives and incentive caps, and equipment selection (see Table 205).

Table 205. Customer Satisfaction[1]

Question Topic	Sample Size (n)	Very Satisfied	Somewhat Satisfied	Not too Satisfied	Not at all Satisfied
Expertise provided by the Energy Advisors	53	83%	17%	-	-
Your overall experience with the project	60	77%	23%	-	-
Communication with Focus on Energy representatives	54	70%	28%	2%	-
Expertise provided by other Program staff	45	69%	31%	-	-
Your experience with the Trade Allies	50	66%	34%	-	-
Availability of the Energy Advisors	54	61%	26%	13%	-
Custom project preapproval process	18	56%	39%	-	6%
Training provided by Focus on Energy	30	53%	40%	-	7%
Clarity of Focus on Energy's project eligibility requirements	58	50%	38%	12%	-
Prescriptive incentive application process	48	48%	35%	15%	2%
Increase in the custom project incentive cap	32	47%	47%	3%	3%
Selection of Equipment	49	45%	51%	4%	-
Incentive amount	56	43%	52%	4%	2%
Time it took to receive the incentive	16	31%	50%	19%	-

[1]Table 205 lists customer survey results. Energy teams responded to two satisfaction questions. Those responses are identified in the text, not in this table.

Source: Focus on Energy Business Programs—Large Energy Users Participant Customer Survey CY 2013: QE1: "I will ask about some different parts of the project. Please indicate if you are very satisfied, somewhat satisfied, not too satisfied, or not at all satisfied with each of these areas. If something does not apply, please let me know."

The Evaluation Team compared six components of the Program from CY 2012 and CY 2013 to assess satisfaction trends (see Table 206). Customer responses show that satisfaction levels declined significantly for the following four components:

- Clarity of project eligibility requirements
- Selection of equipment
- Incentive amounts
- Time required to receive incentive

Customer satisfaction remained the same for the custom project preapproval process.

Table 206. Satisfaction by Topic by Year

Question Topic	Program Year (CY)	Sample Size (n)	Very Satisfied	Somewhat Satisfied	Not too Satisfied	Not at all Satisfied
Clarity of Focus on Energy's project eligibility requirements[1]	2012	19	74%	21%	5%	-
	2013	58	50%	38%	12%	-
Selection of Equipment[1]	2012	19	68%	32%	-	-
	2013	49	45%	51%	4%	-
The incentive amount[1]	2012	19	84%	11%	5%	-
	2013	56	43%	52%	4%	2%
Custom project preapproval process	2012	15	53%	33%	13%	-
	2013	18	56%	39%	-	6%
The time it took to receive the incentive[1, 2]	2012	18	72%	28%	-	-
	2013	16	31%	50%	19%	-
Your overall experience with the project	2012	19	79%	21%	-	-
	2013	60	77%	23%	-	-

[1]Statistically significant at a 90% confidence level.

[2]The Evaluation Team recalculated CY 2012 satisfaction results to match the parameters of the CY 2013 evaluation (i.e., excluded responses "don't know," "not applicable," and "refused"). Source: Large Energy User Customer Survey Frequencies CY 2012 and CY 2013.

The Evaluation Team asked customers to elaborate on any response where they reported they were less than "very satisfied." Overall, customers expressed a growing fatigue with the complexity and difficulty of some Program components. The following list summarizes their responses.

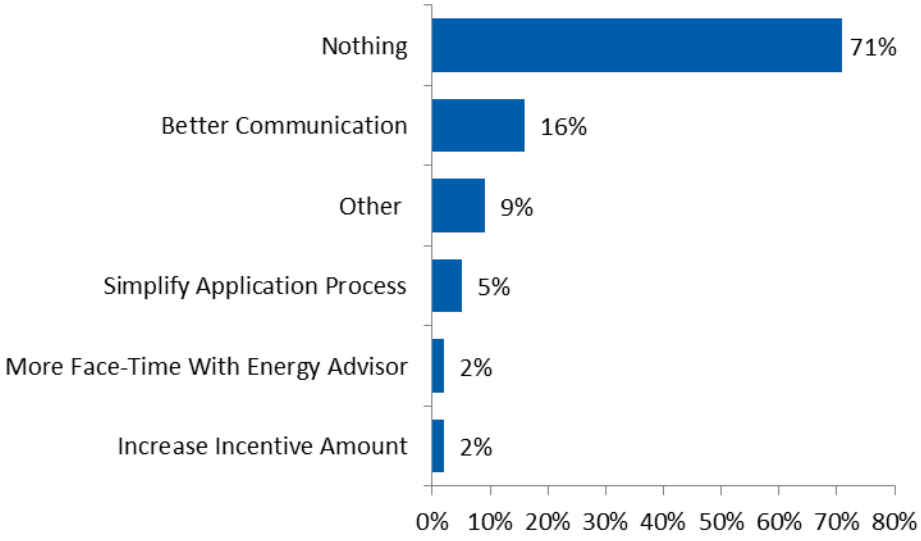
- **Project eligibility requirements were confusing.** Customers said they did not understand what equipment was eligible in various situations (such as new versus existing construction) and the equipment list provided on the website was not searchable, which made it difficult for them to quickly determine if equipment under consideration qualified.
- **Prescriptive equipment selection was too narrow and not representative of the latest technologies.** One customer said this forced his project into the custom program and put the burden on him to provide evidence of new technology efficiencies as part of his submittal.
- **The equipment incentives changed and decreased too quickly**. Customers described incentives changing or being eliminated before they could get a project through their internal vetting process.
- **Incentives payments took too long.** Some customers said incentives for large or custom projects took four to six months to arrive. Several customers said by the time the check arrived, they didn't remember what it is for.
- Program application forms and processes were too complex and time consuming.

- Customers said the amount of detail required by the custom program and the long preapproval process did not match their companies' decision-making timeframes. Customers reported the same concern in CY 2012.
- Customers told the Evaluation Team they were caught in a time-consuming bind when they were asked for detailed savings calculations from Focus on Energy; they reported that for equipment not yet installed, they spend a great deal of effort to produce the documents required. They also said the delays in the preapproval process caused them to miss project opportunities. Several customers said the incentives did not always justify the effort required to secure them.
- Trade Allies lacked information and training about the Program and the paperwork required.

- **Program forms were repetitive.** Customers said they provided company information (such as name address and tax identification), on every application form they submit. They would like to provide this to the Program one time and have application forms self-populate this information.

When asked for their recommendations to improve the Program, 71% of the customers said nothing could have been done to improve their experience (see Figure 162). Notably, however, a healthy minority of customers felt improvements were needed (29%) and previous questions were able to elicit more details about areas for those improvements.

Figure 162. Customer Recommendations to Improve Overall Experience with the Program



Source: Focus on Energy Business Programs—Large Energy Users Participant Customer Survey CY 2013:
QE3: "Is there anything that [IF B1=1 THEN READ, "Focus on Energy" IF B1=2 THEN READ "the contractor"] could have done to improve your overall experience with the Large Energy Users Program?"
(n= 58 multiple responses allowed)

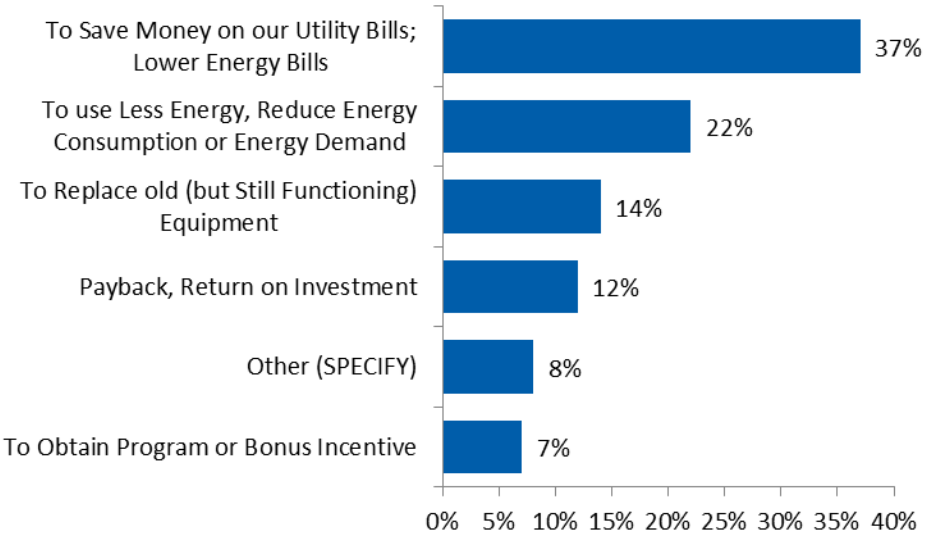
In addition, two customers suggested specific ways to simplify the Program and streamline the application processes.

- One customer suggested Focus on Energy could accelerate the custom project preapproval process if they accepted a projected savings range in exchange for a committed incentive range. This would provide the customer with assurance of a bottom-line incentive, which their businesses could use to make a go/no-go decision on the project.
- Another customer suggested Focus on Energy assign customers an identification number which they could insert into the application forms rather than requiring customers repeatedly fill in their business name, address, etc.

Customer Motivation

Large energy users reported participating in the CY 2013 Program to save money and reduce energy consumption. These top two motivations are consistent with those customers gave in CY 2012. Customers also emphasized payback and the replacement of old but functional equipment as reasons to participate this year. The "other" category included motivations such as meeting corporate sustainability goals and confirming that existing equipment is working properly (see Figure 163).

Figure 163. Reason to Participate



Source: Focus on Energy Business Programs—Large Energy Users Participant Customer Survey CY 2013: QC1: "What factor was most important to your company's decision to make these energy-efficient upgrades?" (n=59)

Nonparticipants

Although the Evaluation Team did not interview nonparticipants in CY 2013, the Program Implementer provided a list of 245 nonparticipant companies. The Evaluation Team reviewed this list for any patterns in nonparticipation and did not find any significant gaps in service either by region or type of industry.

The Energy Advisors said these customers typically did not participate because they lacked funds, they did not have current projects, or energy costs were not a high priority item for them.

Customer Benefits

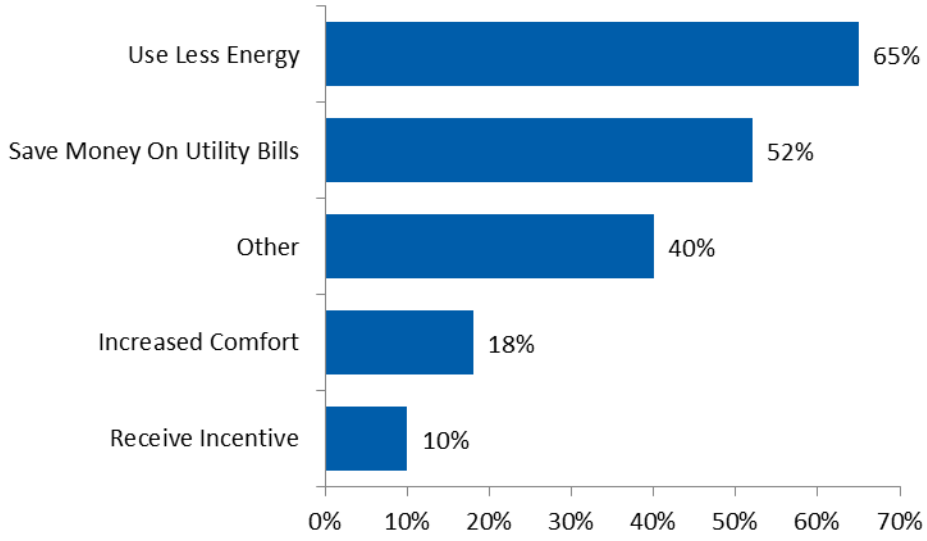
Customers reported that using less energy and saving money on their utility bills were the top two benefits from an energy upgrade (see Figure 164). The "other" category of benefits they cited included:

- Improved reliability of the equipment, reduced maintenance costs, and less equipment down-time
- Improved process operations and more flexibility
- Increased awareness of energy use
- Better quality steam

Customers reported "improved process operations" in CY 2012 but the remaining three benefits are new this year.

When asked if their energy savings were similar to their projected savings, 73% of the respondents said their energy savings were similar, 25% said they were saving more than the projected savings, and 2% said they were saving less. The customer who was saving less attributed it to lack of education in operating the equipment.

Figure 164. Benefits of Energy Efficiency Upgrades



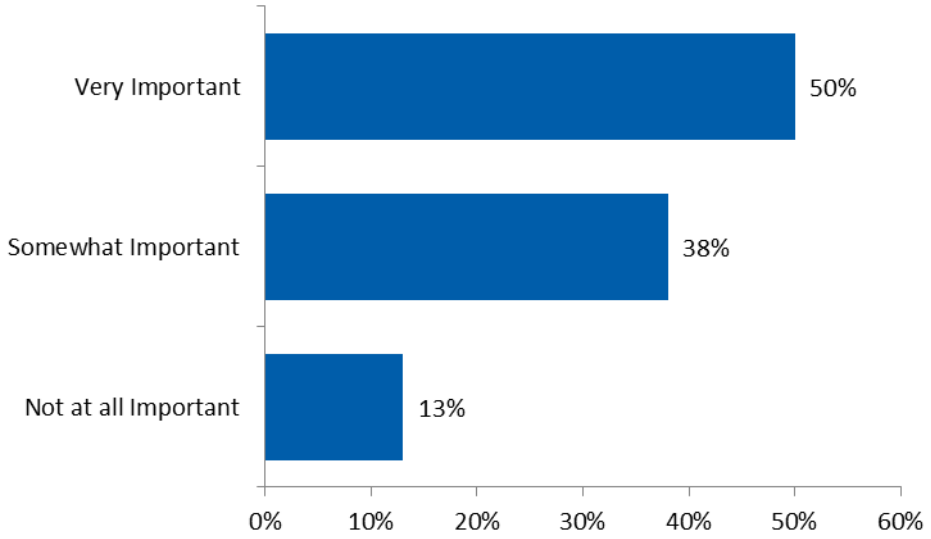
Source: Focus on Energy Business Programs—Large Energy Users Participant Customer Survey CY 2013: QC4: "What would you say are the main benefits your company has experienced as a result of the energy efficiency upgrades we've discussed?" (n=60; multiple responses allowed)

Decision Influences

The Influence of Bonuses

Incentive bonuses had some effect on customer behavior in CY 2013. Although only 45% of customers surveyed were aware of the $0.40 per therm incentive bonus, 88% of those customers said it was "very important" or "somewhat important" in their decision to make their energy efficient upgrades. Thus, the bonus had the desired effect but on a limited scale (see Figure 165).

Figure 165. Influence of $0.40 Therm Bonus



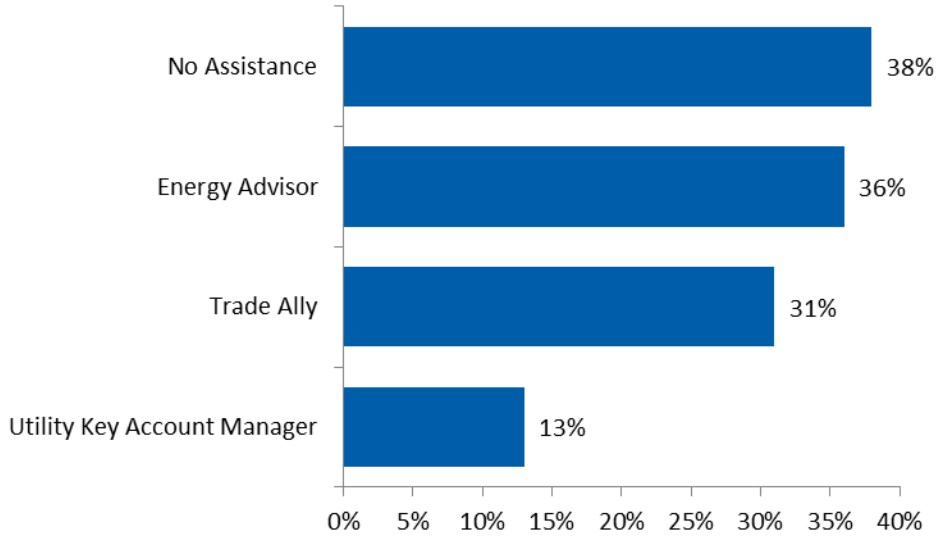
Source: Focus on Energy Business Programs—Large Energy Users Participant Customer Survey CY 2013: QC2: "How important was the $0.40 per therm bonus, in your decision to make these energy-efficient upgrades? Would you say it was …" (n=8)

The Influence of Program Actors and Trade Allies

Energy Advisor, utility Key Account Managers, and Trade Allies influenced some, but not all, customer projects in CY 2013.

Thirty-four customers said a Trade Ally, Energy Advisor, or utility staff member assessed their facility in CY 2013. Twenty-one customers (38%) decided to install energy-efficient equipment without a third-party assessment (see Figure 166). Most projects completed without site assessments were for compressed air measures, variable-frequency drives and boiler tune-ups.

Figure 166. Facility Assessment



Source: Focus on Energy Business Programs—Large Energy Users Participant Customer Survey CY 2013: QA5: "Did anyone walk through your facility and conduct an assessment to help identify energy-efficiency improvements?" (n=55; multiple responses allowed)

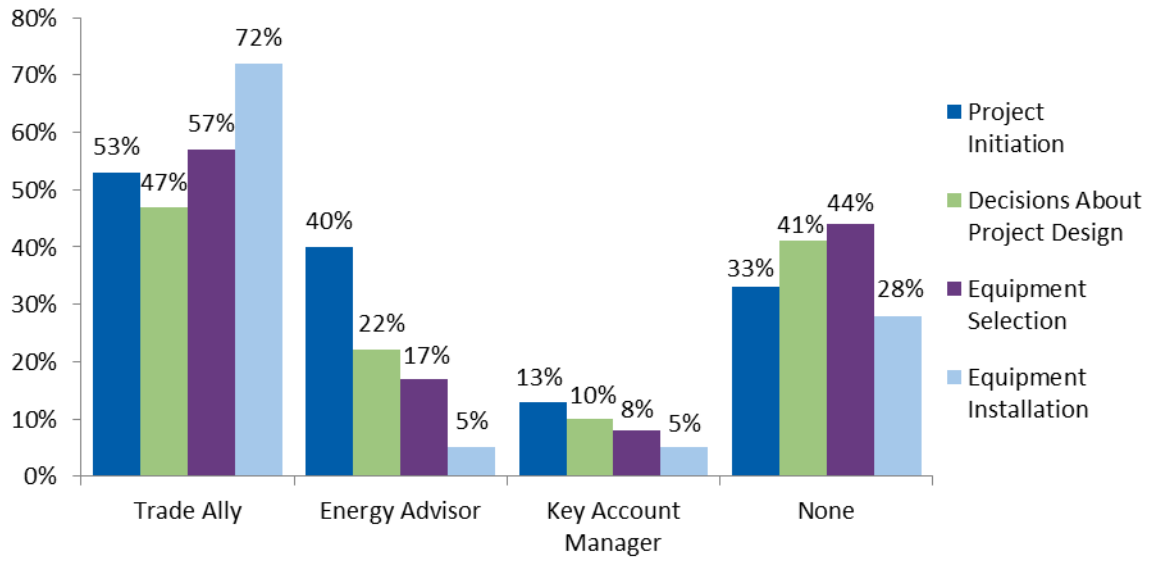
To assess if Trade Allies performed, or could perform, audits of entire facilities, including equipment and systems beyond those they offer through their businesses, the Evaluation Team asked customers about the influence and importance of Trade Allies on different aspects of their projects. It also asked Trade Allies if they assessed customer facilities for project opportunities and if those assessments were whole-facility assessments or specific systems assessments.

Both the customers and Trade Allies said the Trade Allies assess and influence only those systems where they have expertise and provide services. The Energy Advisors confirmed this saying that Trade Ally support "falls off" once the customer has installed lighting, compressed air, and variable-frequency drives. Customers looked to the Energy Advisors for more complex process related energy-efficiency opportunities.

The Evaluation Team then sought to understand Energy Advisor, utility Key Account Managers, and Trade Ally involvement in the different phases of customer projects. Notably, more than 40% of customers did not utilize the Trade Allies, Energy Advisors, or utilities in the project design or equipment selection phases (see Figure 167).

Survey results also show that when these actors are involved, Trade Ally project work increased as projects progress from design through installation, but that Energy Advisor and utility involvement decreased.

Figure 167. Project Involvement by Project Phase

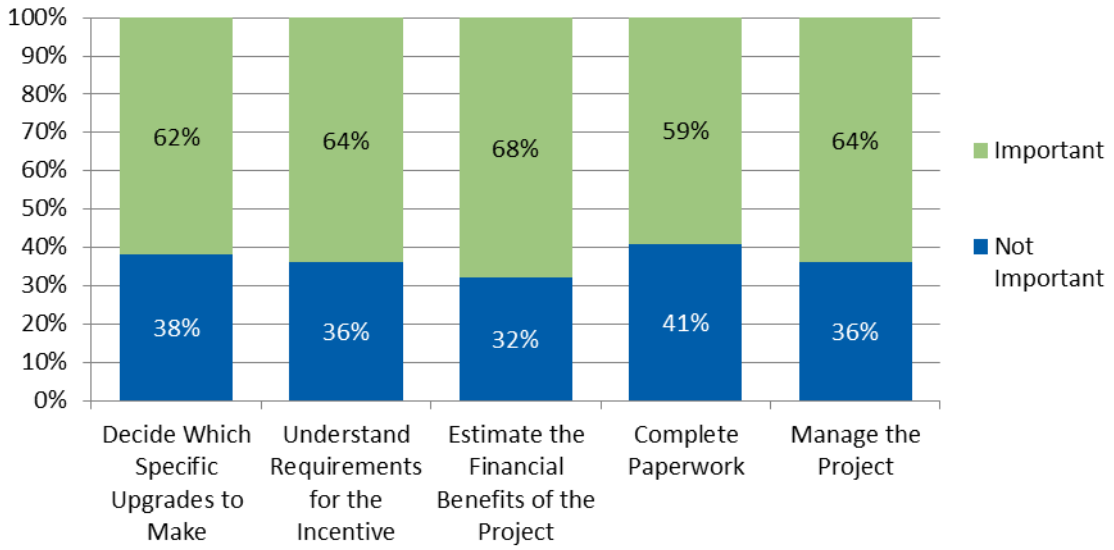


Source: Focus on Energy Business Programs—Large Energy Users Participant Customer Survey CY 2013: QA4: "I'm going to read you a short list, Please tell me if a contractor, vendor, utility account manager, or Focus on Energy-Energy Advisor was involved in any of the following steps" (n=≥59; multiple responses allowed)

The Evaluation Team then focused on the Trade Allies and asked customers about the importance of Trade Allies on project tasks. For this question, the Evaluation Team combined the response categories "very important" and "somewhat important" and the categories "not too important" and "not at all important" to provide a clear indication of importance or unimportance of the Trade Allies' role in each task.

As Figure 168 shows, the majority of customers reported that the contractors were important in each task, especially estimating the project's financial benefits, helping them understand incentive requirements, and managing the project.

Figure 168. Trade Ally Importance by Project Task



Source: Focus on Energy Business Programs—Large Energy Users Participant Customer Survey CY 2013: QC3: "Please tell me if your contractor(s) was/were very important, somewhat important, not too important, or not at all important for each of the following areas. How important was/were the contractor(s) in helping you" (n=≥48)

Barriers to Customer Participation

Program Barriers

When asked "what was the largest challenge" they faced with the Program, 50% of customers said they faced no challenges. The remaining 50% named these similar challenges.

- The time it takes to get a project approved
- Trying to keep up with the frequency and speed of Program changes
- Having too little time and money to find and execute on energy-efficiency opportunities
- The lack of time they receive from the Energy Advisors.

In addition, two customers said their Energy Advisors lacked the technical knowledge to advise them; they specifically mentioned the Energy Advisors lacked understanding of the compressed air measures.

Energy Advisors confirmed their workloads were challenging. One gave an example, "If you have 10 to 120 customers you interact with, it's tough to spend a day at a facility to look at the process. To get to the level of assessment needed by the customer you really need one to two days to identify those [deeper savings opportunities]."

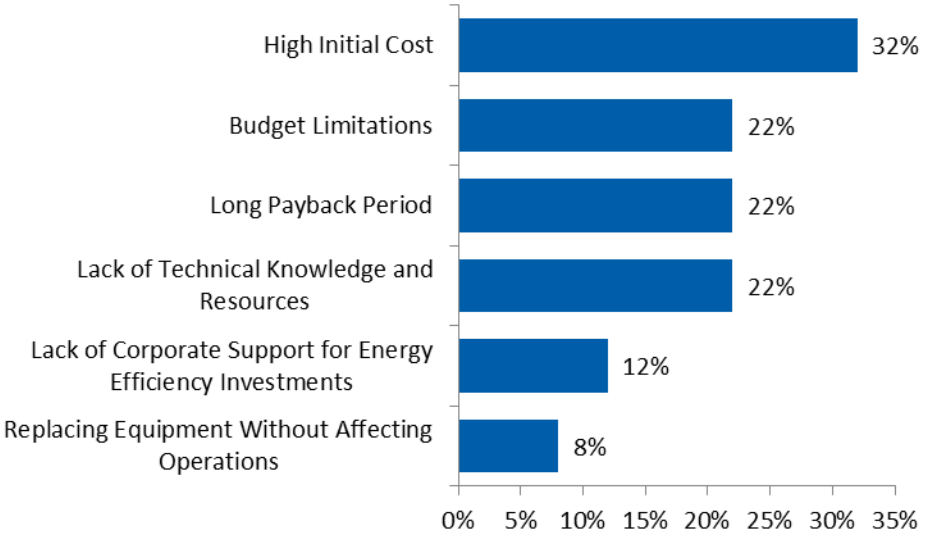
Barriers to Installing Energy-Efficient Equipment

When asked what barriers they faced to installing energy-efficient equipment, the customers' top four barriers changed only slightly from last year. However, in CY 2013 "lack of technical knowledge and

resources" replaced "competition for funding" as the fourth most common barrier. "Competition for funding" dropped from 32% of the responses in CY 2012 to only 2% of the responses in CY 2013 (see Figure 169).

Customers relied on their Trade Allies, Energy Advisors, and, to a lesser extent, their utilities to provide the technical knowledge and resources to identify new opportunities.

Figure 169. Barriers to Energy Efficient Improvements



Source: Focus on Energy Business Programs—Large Energy Users Participant Customer Survey CY 2013:
QD1: "What do you see as the biggest challenges to making energy-efficient improvements inside your company?"
(n= 60; multiple responses allowed)

Customers suggested these Program changes to help them overcome barriers to installing energy-efficient equipment:

- More help from the Energy Advisors
- Staffing grants to add internal resources
- Financial support in the form of more incentives
- Expanded equipment lists
- Inclusion of projects with shorter payback periods

Trade Ally Experience

The Evaluation Team interviewed four Trade Allies in CY 2013 compared to the 15 Trade Allies interviewed in CY 2012. The interviewed Trade Allies included a company providing industrial equipment and services, a lighting supplier, an air compressor supplier, and an HVAC and boiler services company.

Other Program Trade Allies participated in the cross-program focus groups. The Business Incentive Program chapter of this report presents these findings.

Satisfaction

When asked about their satisfaction with the CY 2103 Program, two of the four Trade Allies interviewed said they were "very satisfied" with their overall experience including the training, communication and support they receive from Focus on Energy. They said they were very satisfied with the website, the incentive amounts, the equipment selection and the custom incentive application forms. One Trade Ally said he found the tune-up form very easy to use.

However, Trade Allies were still dissatisfied with many of the same Program components in CY 2013 as they were in and CY 2013.

- Trade Allies again reported Focus on Energy did not inform them about Program changes ahead of their customers. They said they were embarrassed when customers asked about a Program change of which they were unaware.
- Some Trade Allies continued to direct customers to the prescriptive incentive path because the preapproval process for custom measures was too complex and the incentives uncertain. They also said they received conflicting direction from Focus on Energy Advisors and staff about which projects they should submit to which programs.
- Trade Allies said they often relied on the Energy Advisors to provide them with preliminary incentive estimates for custom projects. They valued the information and support the Energy Advisors provide, but said, as they did last year, that the advisors were often overwhelmed with work and not able to respond quickly.

Trade Allies gave the following ideas for important ways to improve the Program:

- Reduce the number of programs offered
- Simplify the approval process for custom measures
- Add more prescriptive measures to the Program
- Improve Program training for new Energy Advisors

Key Program Processes

Findings from the CY 2013 evaluation revealed that in many respects, the key Program processes worked well for the customers and Trade Allies, especially in terms of the expertise provided by Focus on Energy. However, as the Evaluation Team found in CY 2012, customers and Trade Allies said the custom project preapproval and final payment processes were complex and time consuming. For example:

- Several customers described forgoing projects because they could not get preapproval and incentive commitments within their company's planning and approval timeframes.
- Several customers also described receiving incentive checks months after completing projects—so long after project completion that customers could not remember why they received the check.

Customers from other Focus on Energy business programs expressed similar frustration with the preapproval and incentive approval processes. The Evaluation Team conducted a cross-program evaluation of the application and approval processes, with findings summarized in the Business Incentive Program chapter of this report.

Program Cost-Effectiveness

Evaluators commonly use cost-effectiveness tests to compare the benefits and costs of a demand-side management program. The benefit/cost (B/C) test used in Wisconsin is a modified version of the total resource cost (TRC) test. Appendix I includes a description of the TRC test.

Table 207 lists the CY 2011-2013 incentive costs for the Large Energy Users Program.

Table 207. Large Energy Users Program Incentive Costs

	CY 2013	CY 2011-2013
Incentive Costs	$ 8,401,437	$ 13,753,695

The Evaluation Team found the CY 2013 Program to be cost-effective (a TRC benefit/cost ratio above 1). Table 208 lists the evaluated costs and benefits.

Table 208. Large Energy Users Program Costs and Benefits

Cost and Benefit Category	CY 2013	CY 2012
Costs		
Administration Costs	$879,230	$515,758
Delivery Costs	$3,590,264	$2,106,056.20
Incremental Measure Costs	$26,227,257	$12,894,503
Total Non-Incentive Costs	$30,696,752	$15,516,318
Benefits		
Electric Benefits	$75,456,621	$39,002,404
Gas Benefits	$91,239,020	$37,391,547
Emissions Benefits	$45,053,415	$21,788,644
Total TRC Benefits	$211,749,056	$98,182,595
Net TRC Benefits	**$181,052,304**	**$82,666,277**
TRC B/C Ratio	**6.90**	**6.33**

Evaluation Outcomes and Recommendations

The CY 2013 evaluation feedback revealed a number of improvements to the Program operations since CY 2012. The Program Administrator and Program Implementer responded to recommendations offered in the CY 2012 evaluation report, which included improving communication with utility Key Account Managers and providing additional Energy Advisors and technical expertise to customers.

Focus on Energy also responded to customers' requests for incentives on LEDs and more funding for custom projects. They began adding LEDs to the prescriptive equipment list, raised the custom project

cap, and lengthened the payback window (therefore, providing more incentives for complex projects). Additionally, the Program Administrator made changes to the website to make it easier to differentiate between the custom and prescriptive incentives and processes.

Although the Program Implementer rolled out new initiatives and responded to customer input, few of these changes were reflected in customer satisfaction levels. In the CY 2012 customer interviews and CY 2013 surveys, customers expressed satisfaction with Focus on Energy and wanted the Program to continue, but were dissatisfied with the effort it took to understand the Program qualifications and to participate. This may account for the overall Program satisfaction rating remaining the same while specific components declined.

The Evaluation Team identified the following outcomes and recommendations, successes that Focus on Energy can expand on, and opportunities for additional improvements to the Program. The three most significant needs voiced by the customers were more time and manpower, more technical support, and simplification of the application and approval processes. Improving these three areas will decrease barriers to participation and should improve the declining satisfaction rates.

Outcome 1. Customers' energy teams influenced corporate expenditures related to energy use in CY 2013 and can be important allies for the Program.

At the same time, the energy savings these teams can achieve are limited because customers lack the technical expertise and time to identify and pursue complex energy projects that go beyond simple lighting and motor upgrades.

Recommendation 1. Continue Program efforts to develop new teams and support existing teams.

- Provide additional Energy Advisors and technical experts to train and supplement customer staff.
- The Program Implementer, utility Key Account Managers and their supervisors, should meet and establish goals for increasing the number of Key Account Managers who lead the energy teams. Increase the number of Key Account Managers available to lead energy teams, which will increase technical expertise and support to customers (and may increase the number of custom projects).

Outcome 2. Participation in the custom component of the Program depends on the availability and technical expertise of the Energy Advisors.

To take on custom projects, customers expect and require individual attention from the Energy Advisors. Trade Allies also rely on the Energy Advisors for preliminary incentive estimates which they use in their custom project pricing proposals to customers. A limit on Energy Advisors' time, or lack of specific industry expertise, limits the number of custom projects. Although this was not a systematic concern among Trade Allies, those who raised the concern felt strongly that the availability of the Energy Advisors impacted their project pipeline.

Recommendation 2. Reduce the Energy Advisors' work load to allow them more time to work with customers on custom project and/or accelerate the hiring of more Energy Advisors. In addition, ensure Energy Advisors have the necessary industry expertise for the customers they consult with.

Outcome 3. Trade Allies, Energy Advisors, and utility Key Account Managers need more timely information about changes in qualified equipment and incentives and bonus opportunities, to better serve and influence their customers.

Lack of timely information has led to awkward situations with customers and to missed opportunities, which has led to frustration among Trade Allies.

Recommendation 3. Further assess the frequency and content of communication with Trade Allies, Energy Advisors, and utility Key Account Managers.

- The Program Administrator should meet with the Energy Advisors and utility Key Account Managers to determine the type and timing of information they need, and work with them to find a mutually agreeable solution.
- Provide regular training for the Trade Allies to ensure they understand how to implement Program changes and communicate the process they should follow if they need assistance outside of regular training.

Outcome 4. The website is difficult for customers and Trade Allies to use when checking on equipment eligibility.

Reduce the pages required to click through to information on equipment eligibility. This will speed the process and simplify the Trade Allies search and make the path through the site very visible and clear.

Recommendation 4. Provide the following updates to improve website usability.

- A searchable prescriptive equipment list for the Program that includes all eligibility information and incentives.
- A search bar on the Focus on Energy or Business Programs homepage to access the list with one click.

Outcome 5. The compressed air technologies application form does not accommodate the scenario of a single VFD compressor replacing two smaller baseline compressor systems.

It is very important to gather the load profile for each baseline unit as it can dramatically affect project savings.

Recommendation 5. Reformat the application so users can enter a load profile for each replaced baseline compressor.

Outcome 6. Manually-controlled air intake or discharge louvers, used to control the flow of heated air from the compressor equipment rooms, were observed during multiple on-site inspections.

- During multiple on-site inspections, the Evaluation Team encountered sites using manually-controlled air intake or discharge louvers to control the flow of heated air from the compressor equipment room. This configuration limits the effectiveness of the heat recovery systems and leads to concerns about persistence of savings.
- The compressed air application form does not require that heat recovery systems use a room thermostat or other automated means.

Recommendation 6. Manually-controlled compressed air heat recovery systems should not be eligible under the Program due to concerns about persistence of savings. Heat recovery systems should be thermostat-controlled.

Outcome 7. The compressed air technologies application form requires that submitted Compressed Air and Gas Institute (CAGI) data sheets be included for 100-psi rated VFD air compressors even if the applicant is purchasing a unit with a different pressure rating.

This requirement can lead to the use of incorrect maximum flow and input power values in the stipulated savings calculations.

Recommendation 7. Revise the compressed air technologies application form to require a CAGI data sheet matching the new unit's performance characteristics.

Outcome 8. No air-loss condensate drains are difficult to identify on invoices and are difficult to locate on site.

Recommendation 8. Revise the compressed air technologies application form to require specification sheets for new drains or for the air dryer if the drain is implicit to the unit itself. Also request the proposed installation location in the application form.

Outcome 9. Determining the necessary parameter values for certain measures is often difficult without documentation from the applicant or contractor.

There is currently no requirement for the applicant or contractor to submit specification sheets or other documentation when applying for no air-loss condensate drains, cycling refrigerated air dryers, and air mist eliminator measures.

Recommendation 9. Require that specification sheets be included with the application form for no air-loss condensate drains, cycling refrigerated air dryers, and air mist eliminators to enable more accurate determination of savings.

Outcome 10. Savings for pressure/flow controller projects is often difficult to determine. The Evaluation Team observed errors in deemed savings values credited to many of these projects.

The amount of load reduction experienced by a compressor due to a flow controller installation is very specific to the application and more data should be required from contractors installing these systems.

- For more than 60% of the projects reviewed, there were substantial differences (some as high as a factor of 10 to 20) between deemed savings and verified savings. The cause for these differences is unknown, but is suspected to be due to mathematical errors.

Recommendation 10. Review savings methodology for these projects and establish a uniform approach. Require that performance and capacity specifications for the affected air compressor be submitted with the pressure/flow controller application form. In addition, one of two options may help support a uniform approach:

  - Modify the Prescriptive compressed air application form in order to obtain more specific project information; or
  - Move this measure from the prescriptive track to the hybrid or custom track so as to gather more project specific data from the customer.

Outcome 11. Work papers for several compressed air measures understate operating hours.

Associated measures were cycling thermal mass air dryers, no-loss drains, and pressure flow controllers.

Recommendation 11. Revise the deemed savings methodologies for compressed air measures to include operating hours.

Outcome 12. Savings estimates for steam trap survey and repair/ replacement projects are determined by size of system.

Recommendation 12. Collect average orifice diameter along with the steam line pressure in the application.

Outcome 13. Many boiler retrofit projects are complex and include new controls resulting in uncertain savings.

The preferred approach for determining the savings for boiler retrofit projects is through billing analysis (IPMVP Option C).[73] This method requires a minimum of one-year of both pre- and post-retrofit billing data.

Recommendation 13. Use IPMVP Option C to determine the savings for a sample of boiler retrofit projects in order to validate the current deemed savings approach. The Evaluation Team recommends that this be a point of emphasis for the CY 2014 nonresidential evaluation.

[73] IPMVP Option C is defined by the International Performance Measurement and Verification Protocol as a method of performing measurement an verification using metered consumption to determine savings.

Outcome 14. Determining the savings for the 10:1 high turn down burner measure is uncertain.

The few existing studies of this measure are inconclusive or contradictory.

Recommendation 14. Reevaluate the 10:1 high turn down burner measure. Consider performing an evaluation study specific to this measure, particularly if the measure is commonly implemented without a boiler replacement. The Evaluation Team recommends that this be a point of emphasis for the CY 2014 nonresidential evaluation.

Outcome 15. Process boilers often operate longer hours than boilers used for space heating, resulting in greater savings for the associated measures.

The deemed savings for measures such as boiler oxygen trim combustion controls and linkageless controls assume 4,000 annual operating hours.

Recommendation 15. Revise the deemed savings approach for boiler measures when equipment is used in process application.

Outcome 16. Boilers in combination space heating and water heating applications were not identified through the implementation process.

The Evaluation Team encountered several boiler-replacement projects involving boilers used for space and domestic water heating as well as an indirect water-heater project.

Small Business Program

The Small Business Program (the Program) launched July 2, 2012, to encourage customers with less than 100 kW of average monthly demand to install easy and affordable energy-efficiency upgrades. The Program offers free on-site energy assessments and installation of a package of energy-efficiency measures. Trade Allies conduct 30- to 45-minute energy assessments at customer facilities . Following the energy assessment, customers may request Trade Allies to install a free package of energy-efficiency equipment or to purchase additional energy-saving measures as part of a package or individually.

The Program's basic offering in CY 2013 was the Free package.[74] The Gold package offered a pre-set group of additional measures,[75] at a price of $129. The A La Carte offering provided additional individual measures at discounted prices.[76]

During CY 2013, the Program operated almost identically to the CY 2012 Program. Because of increased project volume, the Program Implementer (Staples & Associates) adjusted some of the incentive amounts and equipment quantities to allow funding to last through the end of the year.

Table 209 provides a summary of Small Business Program's actual spending, savings, participation and cost-effectiveness.

Table 209. Small Business Program Actuals Summary

Item	Units	CY 2013 Actual Amount	CY 2012-2013 Actual Amount
Incentive Spending	$	$ 11,437,126	$ 13,743,553
Verified Gross Life-Cycle Savings	kWh	877,624,160	1,052,576,837
	kW	18,021	21,302
	therms	1,406,318	1,713,333
Net Annual Savings	kWh	66,033,437	79,676,199
	kW	12,433	15,061
	therms	111,766	133,670
Participations	Unique Customers	5,176	6,235
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	1.30	4.17 [1]

[1] The cost-effectiveness ratio is for CY 2012 only.

Figure 170 shows a summary of savings and spending in CY 2012 and CY 2013.

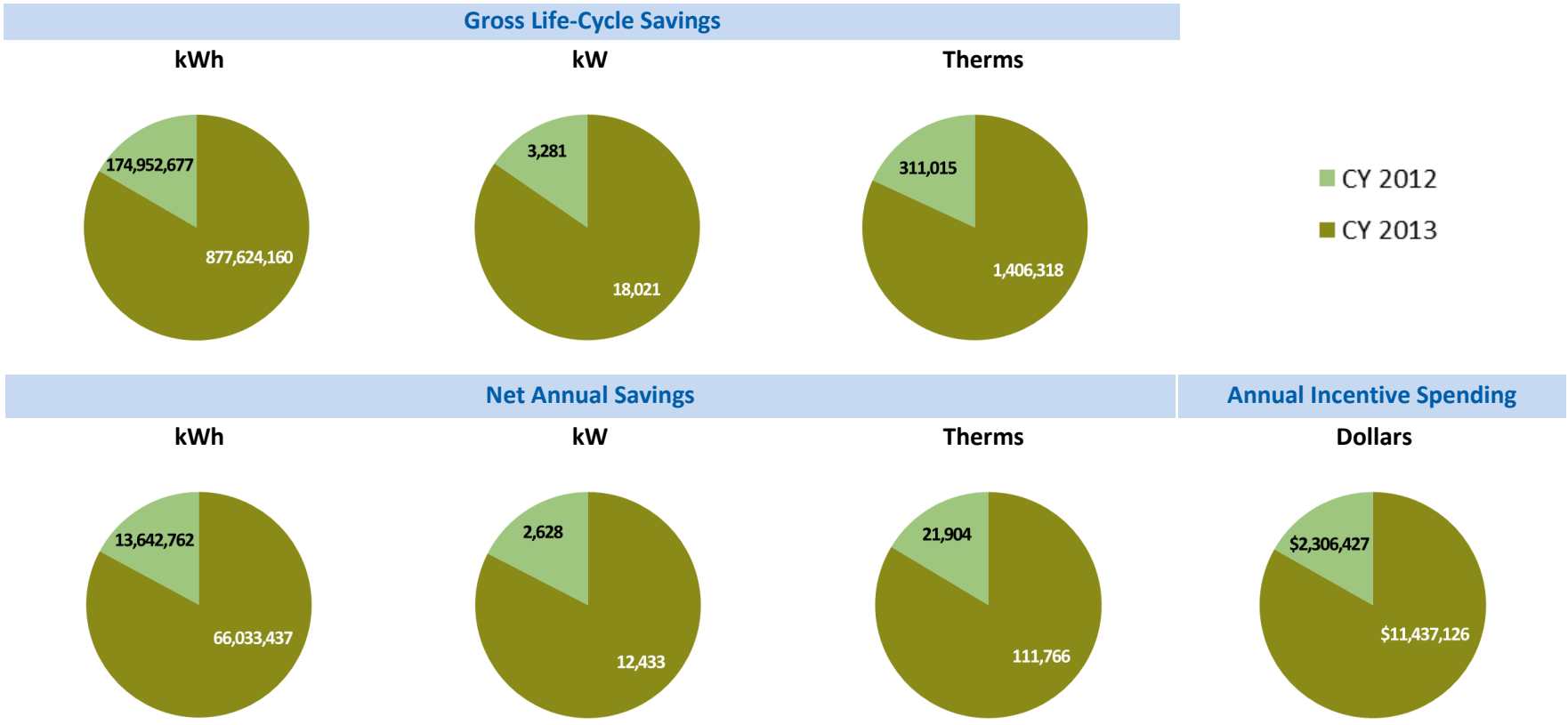
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[74] The Program renamed the Free package to "Silver package" for CY 2014.

[75] The Gold package included three additional measure types (LED exit signs, occupancy sensors, and T8 fluorescent lights), plus 40 more LED lamps than the Free package.

[76] The Program replaced the A La Carte offering with the Platinum package for CY 2014.

Figure 170. Small Business Program Four-Year (CY 2011-2014) Savings and Budget Progress



Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted impact and process evaluations for CY 2013. These were the key questions that directed the Evaluation Team's design of the EM&V approach:

- What are the verified gross and net electric and gas savings?
- How effective and efficient are the Program's operations?
- How can the Program's delivery processes cost-effectively increase its energy and demand savings?
- How effective are the Program's marketing, outreach, and communication efforts in reaching targeted customers and influencers?
- What are the barriers to increased customer participation, and how effectively is the Program overcoming these barriers?
- How satisfied are customers and Trade Allies with the Program, and how have satisfaction levels changed since CY 2012?
- Is the Program meeting cost-effectiveness requirements?
- How can Focus on Energy improve Program performance?

The Evaluation Team designed its EM&V approach to integrate multiple perspectives in assessing Program performance. Table 210 lists the specific data collection activities and samples sizes used to evaluate the Program.

Table 210. Small Business Program Data Collection Activities and Sample Sizes

Activity	CY 2013 Sample Size (n)	CY 2011-2013 Sample Size (n)
Impact		
Audit of Project Measures Installed[1]	668	668
Process		
Materials Review	1	1
Participant Trade Ally Interviews	15	30
Stakeholder Interviews	9	17
Participant Customer Survey	69	69
Partial Participant Customer Survey	70	70

[1]At 70 unique sites

Data Collection Activities

Impact Evaluation

The Evaluation Team selected a random sample of projects for project audits focused on measure groups that both contribute large amounts of savings to the Program and also represented sources of uncertainty. Table 211 lists gross savings contributions by measure group. Table 212 lists the achieved sample sizes.

Table 211. Small Business Program Gross Savings Contribution

Measure Group	Percentage of Savings		
	kWh	kW	Therms
Domestic Hot Water	2%	-	100%
Lighting	96%	100%	0%
Other[1]	<1%	-1%	<1%
Refrigeration	<1%	<1%	-
Vending & Plug Loads	1%	-	-
Total[2]	**100%**	**100%**	**100%**

[1]This category contains adjustment measures, which resulted in negative savings.

[2]Columns may not sum to 100% due to rounding.

Table 212. Small Business Program Impact Activities by Measure Group

Measure Group	Project Audit
Domestic Hot Water	75
Lighting	564
Other	13
Refrigeration	1
Vending & Plug Loads	15
Total	**668**

Project audits consisted of a detailed review of the official Program invoice from SPECTRUM. The Evaluation Team also conducted impact participant verification calls (independent of process surveys) consisting of e-mail communications and follow-up phone conversations with the customer to collect information not attainable through documentation available in SPECTRUM.

The Evaluation Team developed measure- and category-specific survey forms to facilitate data collection activities and to ensure field engineers collected all appropriate data. Each survey form included key parameters and survey questions pertaining to Program eligibility, facility operations, and general building information. In addition, the field engineers confirmed that measures were installed and operational. The forms typically included the savings algorithms used by the Program to determine gross savings.

Process Evaluation

For CY 2013 data collection, the Evaluation Team focused on surveys of active customer participants, partial customer participants who received an energy audit but did not install any Program measures, interviews with Trade Ally participants, and Program stakeholders.

Program Administrator and Implementer

Stakeholder interviews included staff from the Program Administrator and Program Implementer—including Energy Advisors.

Trade Allies

The Evaluation Team selected active Trade Allies from the CY 2013 Program project list after receiving a list of Small Business Program Trade Allies from the Program Implementer.

Customer Surveys

The Evaluation Team conducted two separate survey efforts—one targeting participating customers and another targeting partial participants.[77] The Evaluation Team selected a random sample of customers from completed projects and a list of partial participants provided by the Program Implementer. The sample was stratified based on the amount of project savings, as well as geographical location as defined by US Census Metropolitan areas, to ensure adequate representation of both urban and rural customers. Sixty-nine participants and 70 partial participants completed the survey.

Impact Evaluation

To calculate gross savings, the Evaluation Team reviewed the Program tracking data and combined this with data collected through project audits.

Evaluation of Gross Savings

The Evaluation Team determined gross savings using the deemed approach:

Deemed Approach: The Evaluation Team calculated project savings using assumptions from current work papers and Focus on Energy's 2010 Deemed Savings Manual, with some parameter adjustments based on findings from on-site inspections and customer interviews. The Evaluation Team made adjustments for the following circumstances:

- Reported quantities did not match the verified quantities in the field.
- The methodology of stipulating Program savings was not transparent or there were apparent errors in savings calculations.

[77] Participants received an energy assessment and installed at least one Program measure. Partial participants received an energy assessment but did not install any Program measures.

Tracking Database Review

The Evaluation Team reviewed the CY 2013 data contained in SPECTRUM (the Program database) for completeness and quality. For the majority of the projects, the only supplemental documentation available in SPECTRUM were invoices for equipment or contracting services, issued to the customer by the Trade Ally implementing the direct install measures at the time of installation. The Evaluation Team generally found that the Program invoices were in alignment with project information in the database. SPECTRUM contained all of the data fields necessary to evaluate the Program.

Gross and Verified Gross Savings Analysis

The Evaluation Team used data from the project audits to analyze each sampled project. Project analysis relied on standardized measure- or category-specific Excel-based calculators, which the Evaluation Team developed for the CY 2013 evaluation.

After calculating verified savings for each project, the Evaluation Team calculated project-level realization rates and rolled up weighted average results at the measure level. The Evaluation Team multiplied measure-level gross savings by the corresponding measure-level realization rate to arrive at the total verified gross savings for the Program.

In addition to data found in project files, the Evaluation Team used deemed assumptions and algorithms to verify measure-level savings. The Evaluation Team developed the assumptions and algorithms using measure work papers and the 2010 Deemed Savings Manual for prescriptive and hybrid measures.

Also as a part of the CY 2013 evaluation, the Evaluation Team developed a list of key parameters for common measures offered through the Program and compared the evaluated values with the stipulated values used in work papers and the 2010 Deemed Savings Manual. Based on the findings of this analysis, the Evaluation Team assessed the validity of the stipulated values used to estimate savings. The following sections discuss the key findings from the analysis.

Engineering Review

To conduct engineering reviews and evaluate the verified electric and gas savings, the Evaluation Team used data from SPECTRUM database extracts and project files.

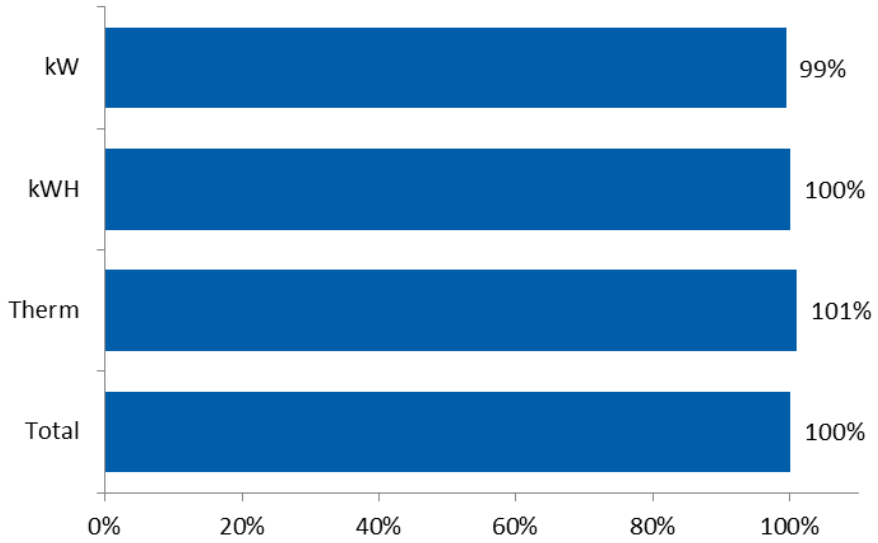
Realization Rates

Overall, the Program achieved an evaluated realization rate of 100%.[78] The Evaluation Team observed higher equipment counts than expected at some facilities, resulting in several project-level realization rates above 100%. For each sampled project, the Evaluation Team used data from project audits to confirm installation and calculate verified savings for the project. For each identified measure group, the Evaluation Team calculated the realization rate by dividing the total verified gross savings by the total reported gross savings.

[78] In actuality, the realization rate was slightly higher than 100% but is rounded down to 100%.

Using this approach, the Evaluation Team calculated the weighted average realization rate for each measure group. Savings for measure groups not identified in Table 212 were not included in the realization rates based on reviews of work papers submitted by the Program Implementers. Figure 171 shows the realization rate by fuel type.

Figure 171. Small Business Program Realization Rate by Fuel Type



Gross and Verified Gross Savings Results

To calculate the total verified gross savings, the Evaluation Team applied measure-level realization rates to the savings of each measure group. Table 213 lists the reported and verified gross savings, by measure type, achieved by the Small Business Program in CY 2013.

Table 213. Small Business Program Gross Savings Summary

Project Type	Reported Gross			Verified Gross		
	kWh	kW	Therms	kWh	kW	Therms
Total Annual	92,429,075	18,120	130,132	92,455,544	18,021	131,421
Total Life-Cycle	878,090,824	18,120	1,374,069	877,624,160	18,021	1,406,318

Evaluation of Net Savings

This section describes how the Evaluation Team assessed net savings for the Small Business Program. To calculate net savings, the Evaluation Team used participant surveys.

Net-to-Gross Analysis

This section provides findings and commentary specific to the Business Incentive Program. For a detailed description of net-to-gross analysis methodology, please refer to Appendix L.

Freeridership Findings

The Evaluation Team used the self-report and standard market practice approaches to determine the Program's freeridership level.

Table 214 identifies the freeridership approach the Evaluation Team applied to each measure type.

Table 214. Freeridership Estimation Approach by Measure Type

Freeridership Estimation Approach	Measure Type
Self Report and Standard Market Practice	Lighting Linear Lighting Controls
Self Report	Domestic Hot Water (DHW) Aeration DHW Insulation DHW Showerhead Lighting Delamping Lighting CFL Lighting LED Refrigeration Vending

Self-Report Freeridership Estimate

The Program had average self-report freeridership of 15.2% in CY 2013.

Standard Market Practice Freeridership Estimate

The Evaluation Team used standard market practice data to estimate freeridership for two measure types: Lighting Controls and Lighting Linear. Table 215 shows the standard market practice freeridership value for each group.

Table 215. Small Business Program Standard Market Practice Freeridership Estimates by Measure Type

Measure Type	Standard Market Practice Freeridership Estimate
Lighting Controls	5.7%
Lighting Linear	73.8%

Overall Freeridership Estimate

By combining the self-report and standard market practice freeridership data, the Evaluation Team estimated that the Small Business Program had overall average freeridership of 28% in CY 2013.

Spillover Findings

The Evaluation Team estimated participant spillover as 0.3% of Small Business Program savings based on self-report survey data. Table 216 shows the spillover measures customers said they installed as a result of their program participation.

Table 216. Small Business Program Spillover Measures

Measure Name	Quantity	Per-Unit Btu Savings	Total Btu Savings
LED Lighting	12	108,1649	12,979,787

Net-to-Gross Ratio

The Evaluation Team calculated an overall Business Incentive Program net-to-gross estimate of 71%, as Table 217 shows.

Table 217. Freeridership, Spillover, and Net-to-Gross Estimates by Measure

Measure Type	Freeridership	Spillover	Net-to-Gross
Overall[1]	28%	0.3%	72%

[1] The Evaluation Team weighted the overall value by the distribution of evaluated gross energy savings for the Program population.

Net Savings Results

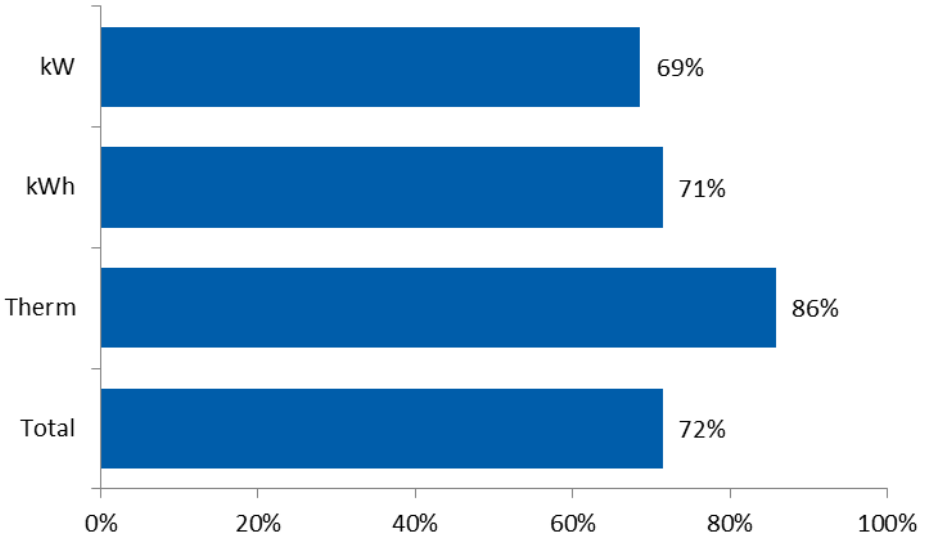
Table 218 shows the net energy impacts (kWh, kW, and therms) for the Small Business Program. The Evaluation Team attributed these savings net of what would have occurred without the Program.

Table 218. Small Business Program Net Savings

Savings Type	Verified Net		
	kWh	kW	Therms
Annual	66,033,437	12,433	111,766
Life-cycle	560,465,686	12,433	1,106,531

Figure 172 shows the net savings as a percentage of the *ex ante* gross savings by fuel type.

Figure 172. Small Business Program Net Savings as a Percentage of *Ex Ante* Savings by Fuel Type



Process Evaluation

This section presents the key findings of the process evaluation for CY 2013. The Evaluation Team analyzed Program data in the SPECTRUM database and gathered feedback from:

- Nine Program stakeholders
- 69 participants
- 70 partial participants
- 15 Trade Allies

Program Design, History, and Goals

After launching in July 2012, the Program experienced limited participation the first few months of its operation, but activity significantly increased by the end of CY 2012. Due to the increased activity, the Program Administrator increased the budget to fund Program offerings through April 2013. During May 2013, the Program Implementer requested the Administrator make changes to the incentive structure so the Program could operate through the end of CY 2014 with the allocated budget. Focus on Energy approved and implemented changes to the incentive structure at the end of May. The adjustments, which did not alter the basic design or product offerings, included:

- Reducing the maximum number of T8 lamps offered to customers
- Reducing the incentive for T8 lamps
- Capping the number of CFLs offered through the Program
- Reducing the incentive for CFLs
- Reducing the incentive for pipe insulation
- Eliminating high bay lighting fixtures
- Capping the Program's maximum incentive at $3,500

As expected, participation levels dropped off following the midyear changes. However, the Program still met the Implementer's expectations for CY 2013. The Program Implementer confirmed that the changes allowed the Program to operate continuously and within the budget through the end of CY 2013. During the year, Trade Allies completed a total of 6,162 Program projects.

Prior to July 2013, the Program Implementer tracked projects by individual measures; after July 2013, the Implementer began tracking projects by package as well. The 2,549 projects for which package information was available were:

- Free package: 155 projects
- Gold package: 1,700 projects
- A La Carte package: 694 projects

The Program Implementer reported that approximately 60% of the customers who received a free energy assessment went on to install projects. It is not a requirement of the Program Implementer to track all free energy assessments, and because many partial customers are not captured in the SPECTRUM database, the Evaluation Team was unable to verify this estimate.

Program Management and Delivery

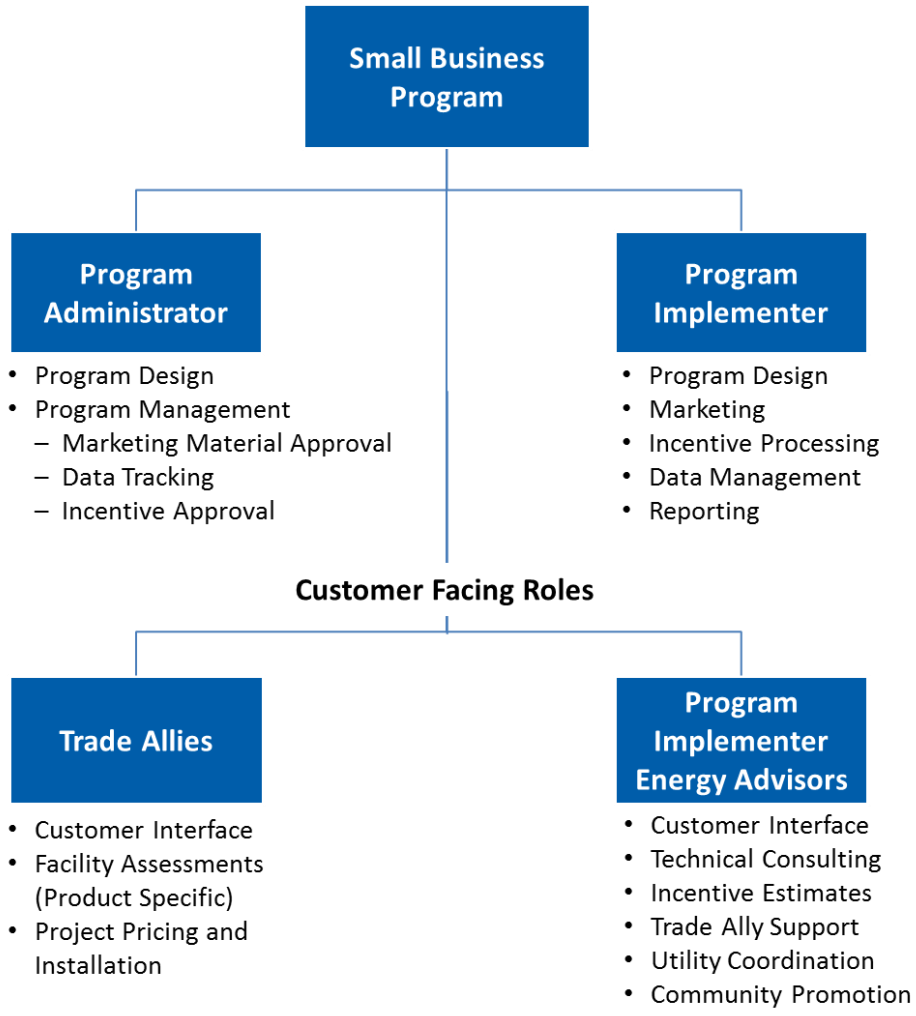
This section describes the various Program management and delivery aspects the Evaluation Team assessed.

Management and Delivery Structure

The Program's management structure did not change in CY 2013. The Program Implementer was responsible for overseeing Program delivery, with assistance from Energy Advisors who were responsible for recruiting, training, and providing general support to Trade Allies.

During interviews, Program stakeholders reported that Trade Allies continued to provide the majority of customer outreach, recruitment, and installation of Program measures in CY 2013. Energy Advisors provided training and support to Trades Allies, partnering with them based on their geographical locations. Energy Advisors also conducted quality assurance checks, following up with customers to ensure their satisfaction and that Trade Allies positively represented the Program. Figure 173 shows a diagram of key Program actors.

Figure 173. Small Business Program Key Program Actors and Roles



Program Data Management and Reporting

The Program Implementer did not change data processing procedures in CY 2013. Trade Allies continued to perform the energy assessments and to collect customer data in the field using an iPad application developed by the Program Implementer. The iPad application allowed Trade Allies to send collected information electronically to the Program Implementer's internal database, where staff checked it for errors. The Program Implementer rejected any jobs submitted with errors and requested the Trade Allies fix and resubmit the applications (jobs were primarily rejected due to application mistakes). The Program Implementer uploaded complete job records into SPECTRUM and processed the incentive payments.

According to Implementer staff, SPECTRUM still lacked a batch upload function for projects completed in CY 2013 (which limited the efficiency of application processing and required more time for redundant data entry).

Marketing and Outreach

In addition to using the Trade Allies as the primary recruiting channel for the Program, the Program Implementer executed several marketing tactics to increase Program awareness and educate customers on the benefits of participation. During CY 2013, the Program Implementer partnered with utilities and participated in several community events, managing a booth and answering customers' questions about the Program.

Additionally, the Program Implementer developed a professionally produced video promoting the Program and its benefits to small businesses in Wisconsin—the video was used on the Program website and other social media. The Program Implementer also sent direct mail and advertised in print ads, on the radio, and on television to promote the Program.

Implementer staff reported that after Trade Ally promotion of the Program, the second most effective method of recruiting participants was through the community events.

Customer Experience

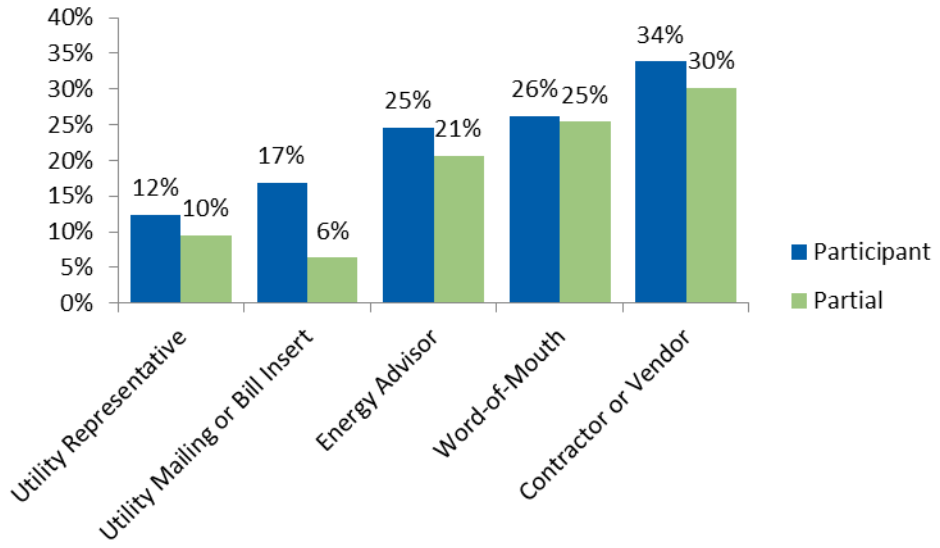
For the CY 2013 evaluation, the Evaluation Team conducted telephone surveys with both participant and partial participants. Sixty-nine participants and 70 partial participants completed the survey. The Evaluation Team examined responses from urban and rural respondents and did not find any statistically significant differences for either sample group.

In both surveys, the Evaluation Team asked participants about several key areas related to their Program experiences. Subsequent sections discuss the respondents' feedback.

Program Awareness

When asked how their organization first heard about the Program, 34% of participants identified Trade Allies as their primary source, 26% said word of mouth, and 25% said a Focus on Energy Advisor (see Figure 174). Participants cited utility bill inserts and representatives less often and a few respondents said they had first heard about the Program from print or television advertisements. A similar pattern follows for partial participants. When asked specifically if they remembered hearing about the Program from their utility, 57% of participants and 41% of partial participants reported that they had.

Figure 174. Customers' Top Sources for First Hearing about the Program



Source: Participant and Partial Participant Customer Surveys: QC1. "How did your organization learn about the Focus on Energy program for small business customers?" (n≥ 63; multiple responses allowed)

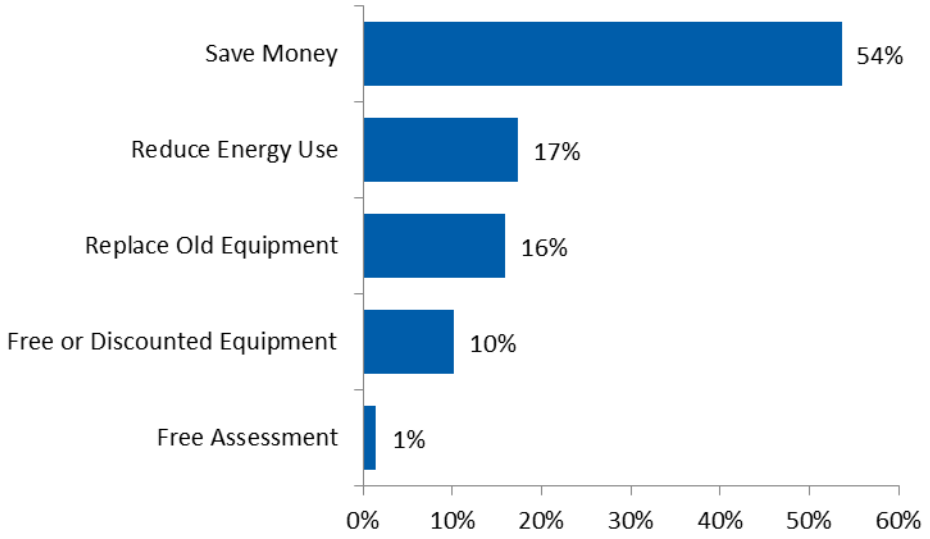
Decision-Making Process

The Evaluation Team asked participants why they participated in the Program and which factors influenced their decisions to choose a certain measure. The following sections detail the respondents' feedback.

Participant Decision Factors

When asked their primary reason for participating in the Program, 54% of respondents said it was to save money on their energy bills (see Figure 175). Respondents also said they participated in the Program to reduce energy use, replace old equipment, or receive free or discounted equipment.

Figure 175. Participants' Primary Reasons for Program Participation



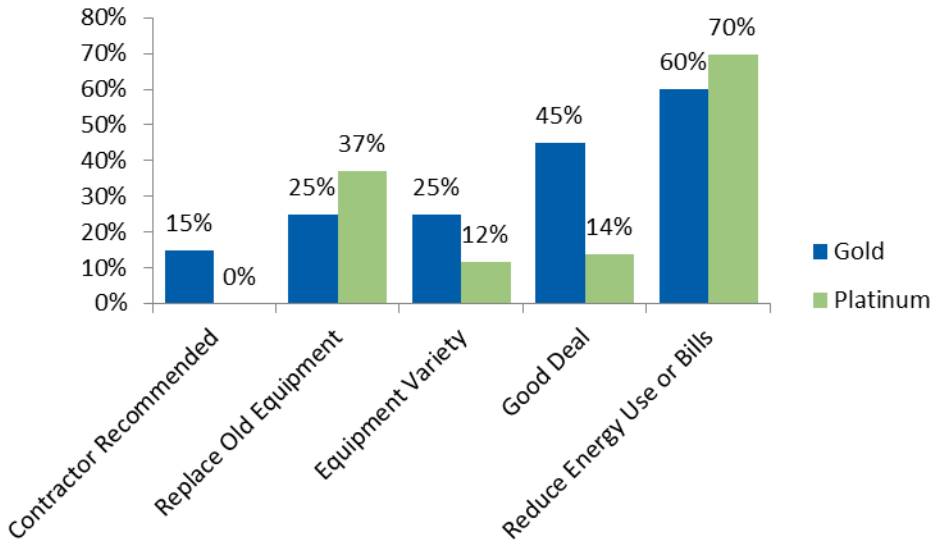
Source: Participant Customer Survey: QD1. "What factor was most important to your company's decision to install energy-efficient equipment discounted by Focus on Energy's Small Business Program?"
(n≥ 68; multiple responses allowed)

The Evaluation Team asked participants why they decided on a particular measure package (A La Carte, Silver, Gold, or Platinum). The 55 participants who chose the Gold or A La Carte package said they chose these packages to reduce energy use or bills (see Figure 176). Nearly half of the participants who chose the Gold package said that the cost of the package was a "good deal." Respondents who chose the A La Carte package indicated they placed higher importance on replacing old equipment more than they did on receiving discounted or free cost of equipment. Only five of the interviewed participants reported they installed the Silver package, which matches proportionally with Program tracking numbers.

According to SPECTRUM, the overall number of participants who installed only the free packages in CY 2013 was low. Two of these respondents said that they chose the free packages because they did not need the equipment offered in the other packages. One respondent did not know additional discounted equipment was available for purchase. The remaining two respondents said they did not know why they chose only the free package.

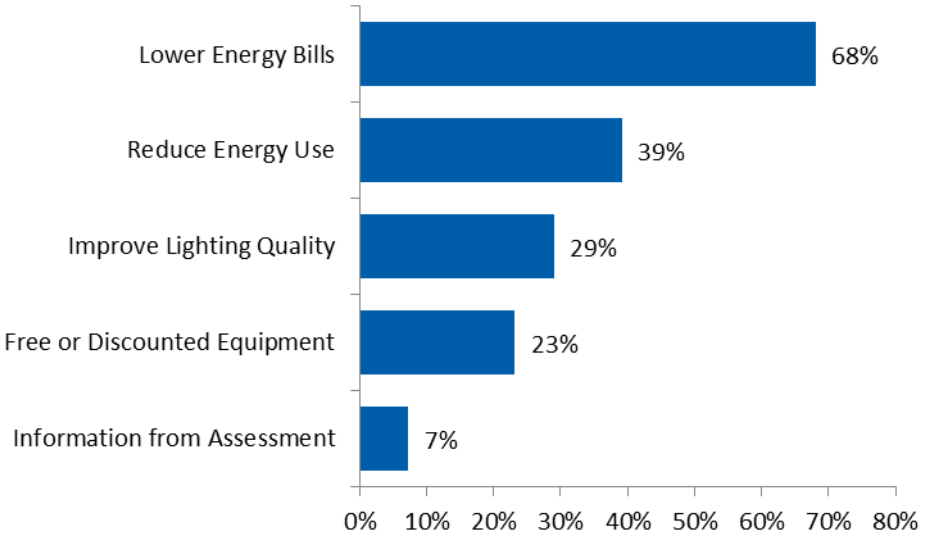
The Evaluation Team asked all 69 surveyed participants to identify the main benefits of participating in the Program. Sixty-eight percent of the respondents said lowering their energy bills was the main benefit, 39% said reducing energy use, 29% said improving lighting quality, and 7% said the information from the assessment was valuable and a benefit (see Figure 177).

Figure 176. Factors Influencing Participants' Decisions to Purchase the Gold or Platinum Package



Source: Participant Customer Survey: QD3-D4. "What factors were important to your company's decision to install the $129 Gold copay package of energy-efficient equipment?" (n≥ 19; multiple responses allowed), and "What factors were important to your company's decision to purchase and install energy-efficient equipment in addition to the $129 Gold copay package?" (n≥ 36; multiple responses allowed).

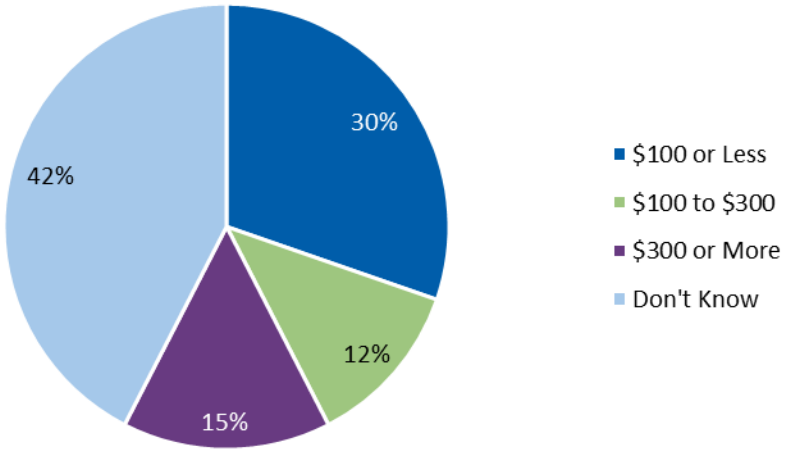
Figure 177. Benefits of Participation



Source: Participant Customer Survey: D5. "What would you say are the main benefits of participating in Focus on Energy's program for small business customers?" (n≥ 69, multiple responses allowed).

When asked if they noticed a reduction in energy bills after participating in the Program, 48% of participants said "yes," 40% said they "don't know," and 12% said "no." Figure 178 shows a breakdown of the savings claimed by the 33 participants; notably, 42% could not estimate their savings. Overall, these participants saved an average of $185 on their energy bills each month after measure installation.

Figure 178. Participant Savings (Only for Respondents with Savings)



Source: Participant Customer Survey: D7. "How many dollars per month has your energy bill decreased?" (n≥33).

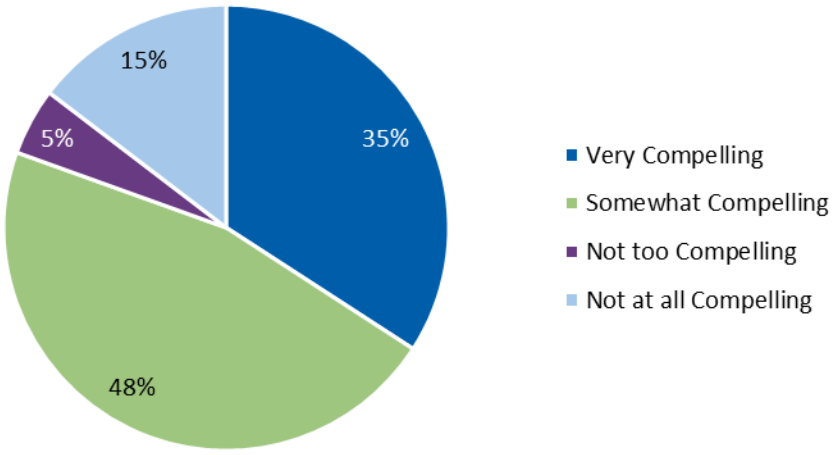
Partial Participant Decision Factors

The Evaluation Team asked partial participants questions about the packages offered and why they did not opt to install measures following their free energy assessment. First, the Evaluation Team asked partial participants if they remembered being offered discounted equipment following the assessment. Sixty-one percent of the respondents said they did not remember the offer. For those who remembered, when asked how compelling the offer was, 80% said they found it compelling (see Figure 179), and just over one-third of these respondents (34%) found the offer "very compelling."

These partial participants said that the money and energy savings made the offer compelling. Partial participants who did not find the offer compelling most frequently cited the cost and the lack of qualifying equipment available to upgrade as drawbacks.

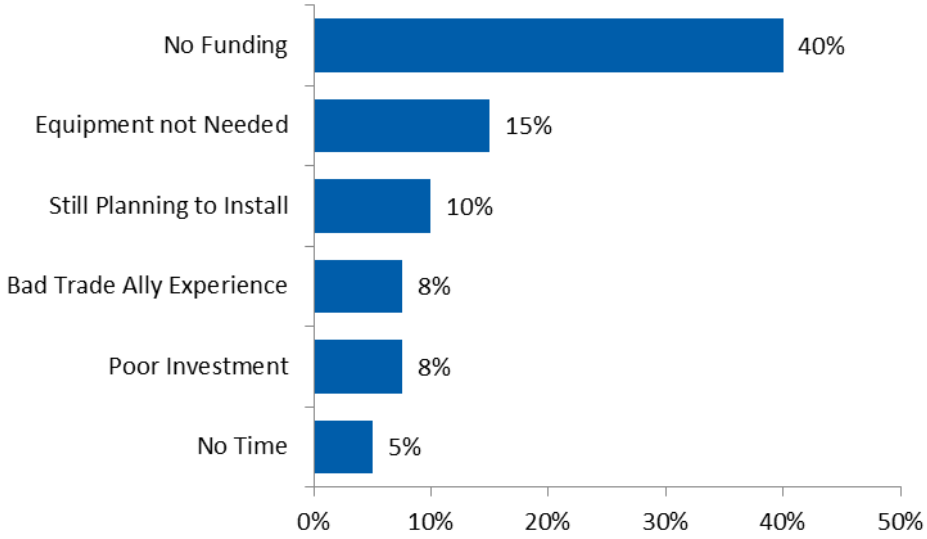
The Evaluation Team asked partial participants what prevented them from installing equipment recommended in the free energy assessment (see Figure 180). Of the respondents, 40% said they did not have the necessary funding, and 15% reported they did not need the recommended equipment. Interestingly, 10% of partial participants said they still intended to install equipment offered through the Program.

Figure 179. How Compelling Discounted Equipment was to Partial Participants Who Recalled the Offer



Source: Partial Participant Customer Survey: D2. "How compelling was the offer for discounted equipment?" (n≥ 40).

Figure 180. Partial Participants' Reasons for Not Installing Measures



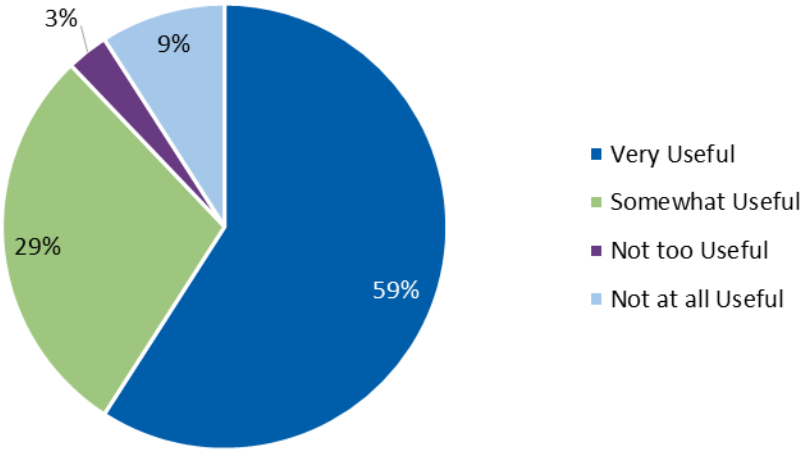
Source: Partial Participant Customer Survey: D4. "What prevented you from having any of the discounted equipment installed following the energy assessment?" (n≥ 40, multiple responses possible)

Energy Assessment

As a primary Program offering, the Evaluation Team asked customers about their experiences with the free energy assessment. All participants responded that the energy assessment was "very important" (72%) or "somewhat important" (28%) in their decision to install equipment.

When asked about the usefulness of the energy assessment in understanding the costs and benefits associated with having efficient equipment installed, 59% of partial participants rated the assessment as "very useful" and 41% rated it as less useful (see Figure 181). These ratings suggest many partial participants saw the free energy assessment less motivating than participants did.[79]

Figure 181. Usefulness of Energy Assessment to Partial Participants

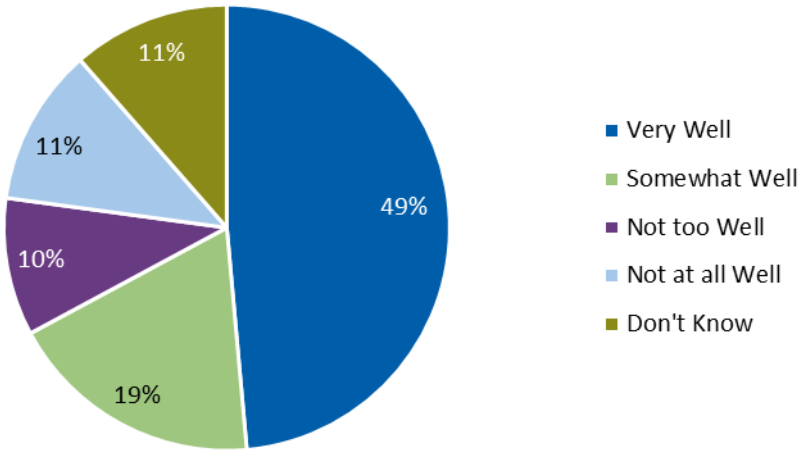


Source: Partial Participant Customer Survey: G5. "How useful was the Focus on Energy free assessment in explaining the costs and benefits associated with having efficient equipment installed?" (n≥ 66).

The survey also asked partial participants to rate how well the energy assessment met their expectations. Sixty-eight percent of the respondents indicated that the assessment met their expectations (see Figure 182). Respondents who reported that the assessment was not useful or did not meet their expectations cited the following reasons: the time that it took, lack of options in equipment recommendations, and not receiving clear enough information.

[79] The Evaluation Team did not ask survey participants to provide information on the identities of Trade Allies they worked with, so the Evaluation Team did not assess if the usefulness of the assessment varied by Trade Ally.

Figure 182. How well did the Assessment Meet Partial Participant Expectations?



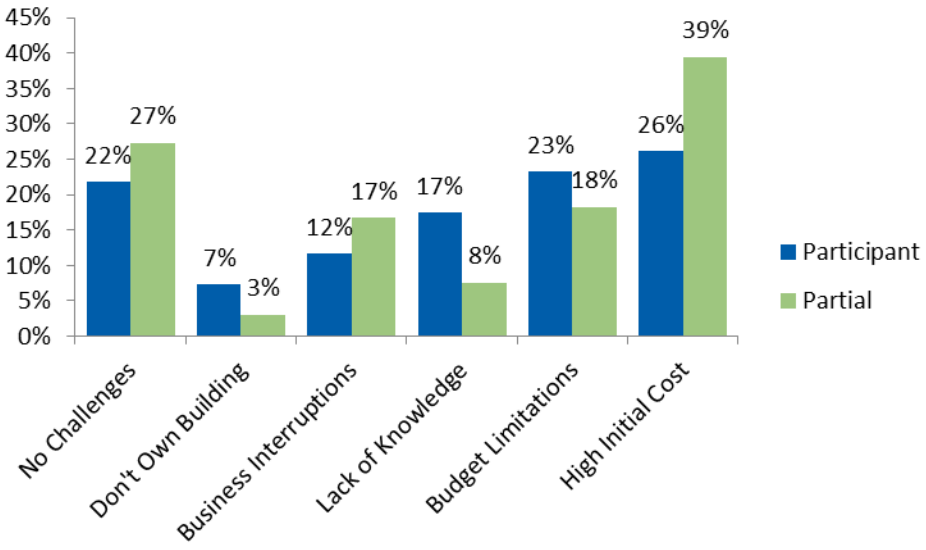
Source: Partial Participant Customer Survey: G7. "How well did the free energy assessment meet your expectations?" (70≥ smallest n value).

The Evaluation Team asked both participants and partial participants whether a Trade Ally or a staff member from the Program Implementer referred them to another Focus on Energy program following the assessment. Nineteen percent of the participants and 7% of partial participants said someone had referred them to another program.

Barriers to Participation

When asked what they see as the biggest challenges to making energy-efficient upgrades inside their companies, both participants and partial participants identified cost-related reasons as the primary barriers (see Figure 183). Participants also reported "a lack of knowledge" as a potential barrier.

Figure 183. Participant Barriers to Efficient Equipment Installation



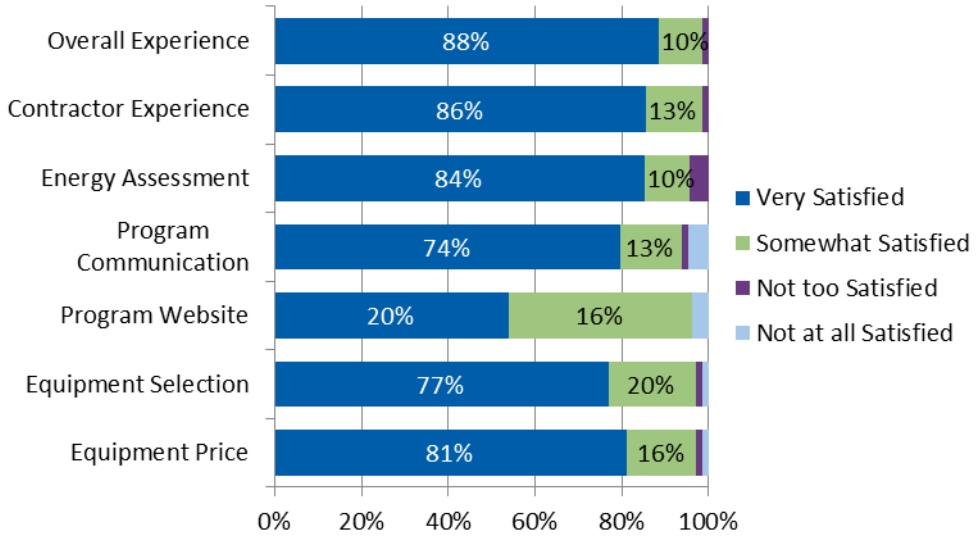
Source: Participant and Partial Participant Customer Survey: E1. "What do you see as the biggest challenges to making energy-efficient improvements inside your company?"
(n≥ 69 participant and 66 partial participants; multiple responses allowed).

Participants and partial participants responded similarly when asked how Focus on Energy could help alleviate some of the reported barriers. Respondents most frequently said "higher incentives" and "more information about Program offerings" would remove barriers to their participation. However, many participants said that Focus on Energy cannot do anything more to help their businesses overcome the challenges to participation.

Participant Satisfaction

The survey asked participants about their satisfaction with the Program overall and with various components of the Program (see Figure 184). When asked about their overall experience with the Program, 84% of participants said that they were "very satisfied." Three-quarters or more of participants reported they were "very satisfied" with all of the individual Program components (contractors, assessment, communication, equipment price and selection), except for the Program website. The majority of participants (62%) said they did not know how to rate their satisfaction with the website, possibly indicating they had not visited it.

Figure 184. Participant Satisfaction



Source: Participant Customer Survey: F1. "How satisfied are you with [Program element]?" (n≥ 69; values under 10% are not labelled).

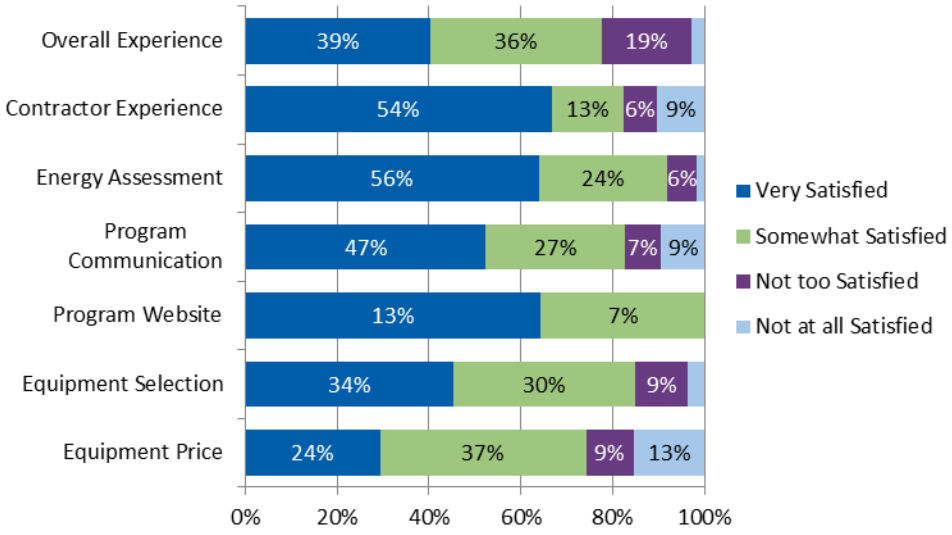
The Evaluation Team asked participants who gave less than "very satisfied" ratings for the reasons behind their ratings. Those who had lower satisfaction with contractors (Trade Allies) said they experienced minor installation or communication issues, many of which were resolved by the Trade Ally or Focus on Energy staff. Participants who reported lower satisfaction with the energy assessment indicated the assessment lacked clarity about how much energy savings to expect.

Participants who reported lower satisfaction with Program communication generally cited a lack of communication with Focus on Energy representatives and said that most of their communication was with the Trade Ally. Participants who reported low or no satisfaction with the website generally had not regularly used the site. When asked about low ratings for equipment selection and price, participants said the costs were too high, energy savings were insubstantial, and they did not have enough equipment options.

Partial Participant Satisfaction

Forty percent to 50% of the partial participants were "very satisfied" with most of the Program components (see Figure 185). Relatively few respondents said they were "not too satisfied" or "not at all satisfied" with their Program experiences, and 13% to 37% reported they were "somewhat satisfied" with the majority of their experiences. Partial participants were least satisfied with equipment selection and price; only 34% of the respondents said they were "very satisfied" with selection and 24% said they were "very satisfied" with the price.

Figure 185. Partial Participant Satisfaction



Source: Partial Participant Customer Survey: F1. "How satisfied are you with [Program element]?" (n≥ 70; values under 6% are not labelled).

Partial participants who reported low satisfaction with their contractors said the contractor did not follow up with them after the initial visit and that communication was poor. Those who reported low satisfaction for the energy assessment said the contractor did not explain everything clearly or they did not receive hard copy of the results. Like participants, partial participants who reported low satisfaction with Program communication said it was due to a lack of communication with Focus on Energy representatives. Most partial participants said they have not used the Program website. Partial participants gave the lowest satisfaction ratings for the cost of the equipment.

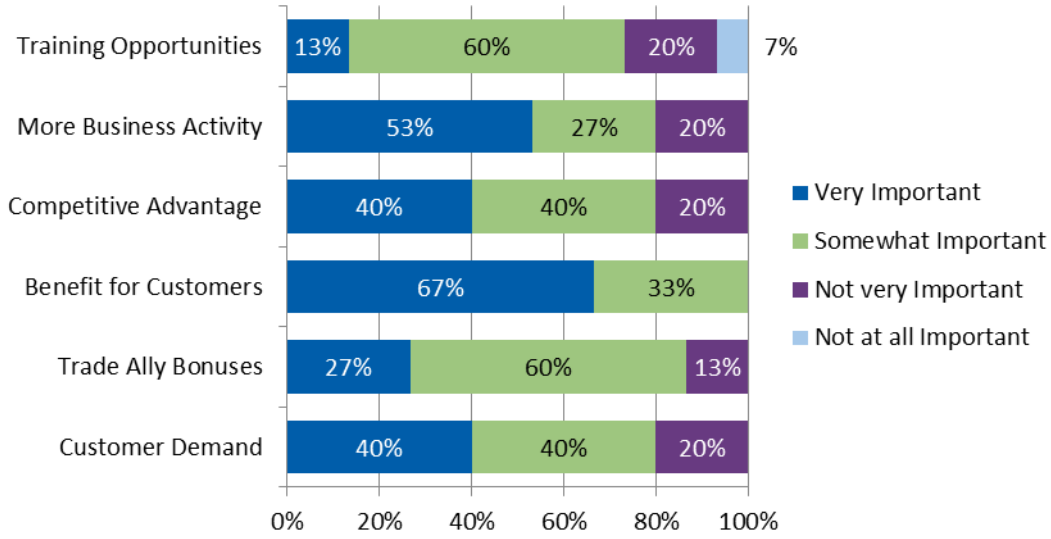
Trade Ally Experience

The Evaluation Team conducted 15 surveys of Trade Allies participating in the Program. To ensure a diverse representative population of Trade Allies, the Evaluation Team selected a sample that included consideration of the Trade Allies' activity level and attributed savings. The survey covered these topics: reasons for participation, communications with the Program, training experience, marketing activities, and satisfaction. This section details the Trade Allies' feedback.

Program Motivation, Knowledge, and Communication

When asked to rate the importance of six possible motivations to participate in the Program, surveyed Trade Allies said the most important motivations were the benefits for their customers and increased business activity (see Figure 186). Customer demand and competitive advantage were also very important motivators for a minority of Trade Allies. When asked if any additional factors influenced their decision to participate in the Program, Trade Allies did not identify any.

Figure 186. Motivating Factors for Trade Ally Participation



Source: Participant Trade Ally Interview Guide: 3. "There may be several reasons you participate in the Small Business Program. Please rate the importance of the following factors..." (n≥ 15, multiple responses possible)

When asked about their main sources for information about the Program, 12 respondents said contact with their Energy Advisor by phone or e-mail, and six said the Focus on Energy website. In CY 2012, Trade Allies also identified the Energy Advisor as their primary source of information. In addition, most respondents said the Focus on Energy newsletter was a source, but they did not mention the newsletter in CY 2013.

Most Trade Allies said they preferred to receive information from their current source; however, three respondents indicated they would like more in-person meetings with their Energy Advisors.

As a requirement for Program participation, Trade Allies had to complete training with their Energy Advisors. During the training, Energy Advisors instructed Trade Allies on how to use the iPad tool and performed a supervised assessment with Trade Allies. When asked about which activities they remembered participating in, most remembered the iPad training and walkthrough, several said they participated in a webinar about the Program, and two said they did not receive training (see Figure 187).

These results almost duplicate the CY 2012 survey results, where most respondents remembered the iPad training and walkthrough, and two Trade Allies said they did not receive training.

Figure 187. Training Activities Trade Allies Participated In



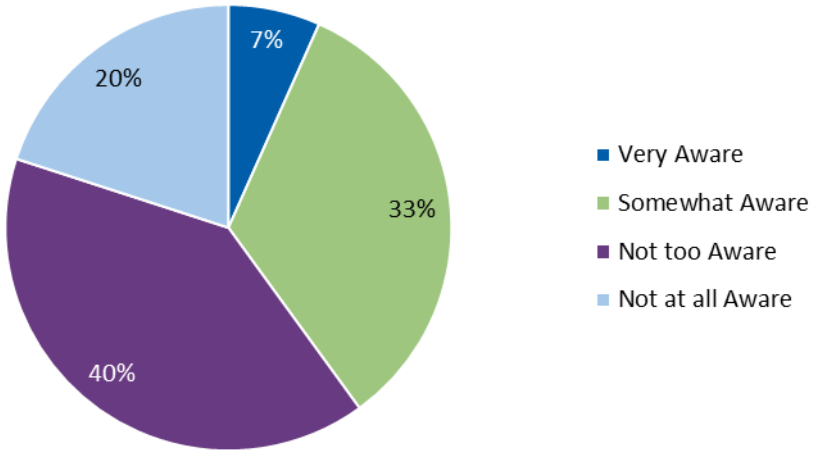
Source: Participant Trade Ally Interview Guide: 7. "There may be several reasons you participate in the Small Business Program. Please rate the importance of the following factors?" (n≥ 15)

When asked for their opinions on the most important aspect of the training, five Trade Allies responded that all of the training was important, but the remaining respondents were split between the iPad training and the walkthrough. Ten of the 15 Trade Allies said they would improve nothing about the training. The remaining five said they would like to receive more detail on Program processes and spend more time with their Energy Advisors.

Customer Marketing and Outreach

The Evaluation Team asked the Trade Allies about their opinions on the customers' awareness of the Program. As in CY 2012, a large majority of Trade Allies (93%) said customers had limited awareness of the Program ("somewhat," "not too," or "not at all" ratings), as shown in Figure 188.

Figure 188. Trade Allies Opinions on Customers' Awareness of the Program

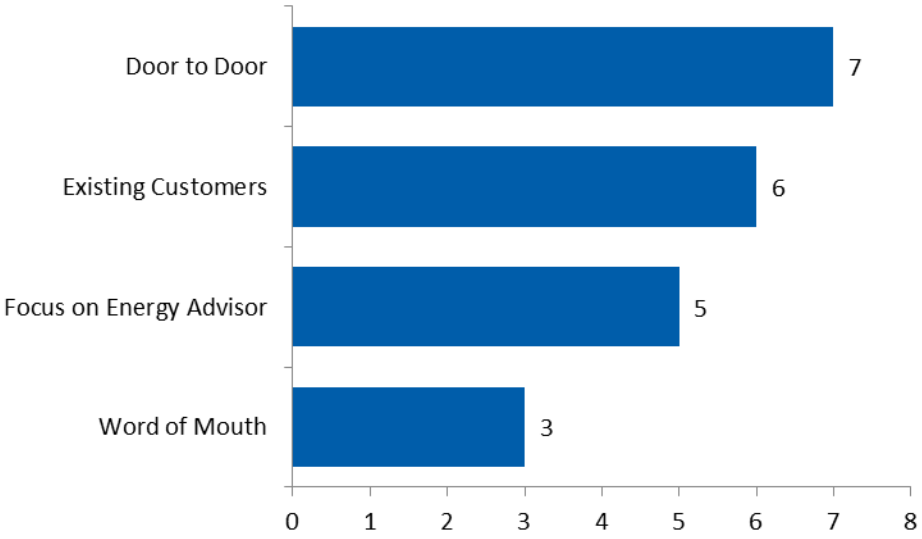


Source: Participant Trade Ally Interview Guide: 10. "In general, how aware of Focus on Energy are the business customers you work with?" (n≥ 15).

Trade Allies reported several methods for finding customer leads. As shown in Figure 189, Trade Allies most frequently reported going door to door and speaking with their existing customers as their primary sources for customer leads. The Energy Advisors also contacted customers directly and provided qualified leads to the Trade Allies, along with other leads from customers who contacted Focus on Energy about the Program.

Several Trade Allies said that word of mouth generated leads as well. In CY 2012, Trade Allies reported that Energy Advisors provided leads more often than in CY 2013.

Figure 189. Trade Allies' Primary Source for Customer Leads



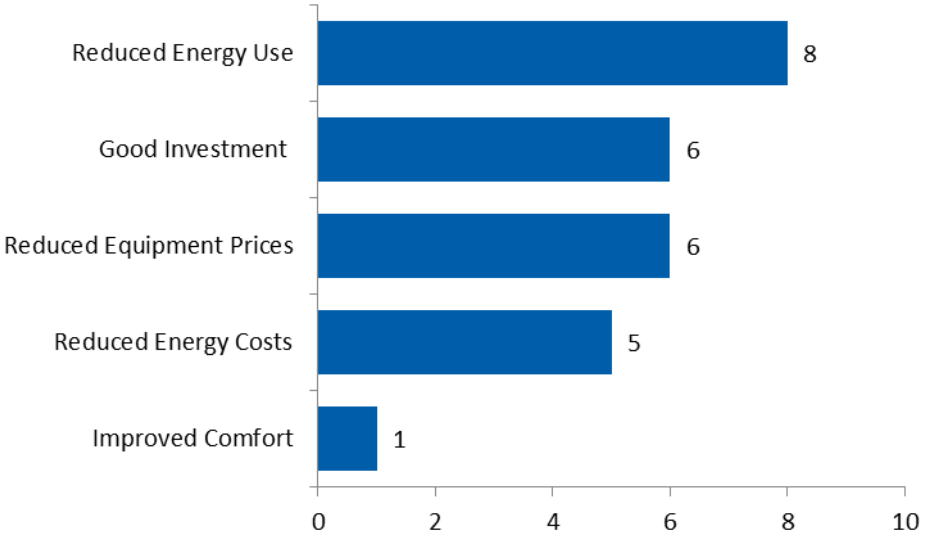
Source: Participant Trade Ally Interview Guide: 11. "Where do you typically get customer leads for Focus on Energy projects?" (n≥ 15; multiple responses allowed).

When asked if they had changed any of their marketing efforts as part of participating in the Program, 11 Trade Allies said that they had not. Three respondents said they increased sales efforts, but one respondent featured the partnership with Focus on Energy prominently in marketing materials. As shown in Figure 190, Trade Allies said that they promoted the following benefits of participation with customers:

- The potential for reduced energy consumption
- Return on investment
- Reduced equipment prices
- Reduced energy costs

Only one Trade Ally indicated promoting improved comfort to customers. Trade Allies responded similarly in CY 2012, but said they focused more on the free installation package with customers.

Figure 190. Benefits Promoted to Customers by Trade Allies



Source: Participant Trade Ally Interview Guide: 13. "What benefits of the Focus on Energy Small Business Program do you promote to your customers?" (n≥ 15, multiple responses allowed).

The Evaluation Team also asked Trade Allies to identify any challenges in recruiting customers to participate. Responses were evenly split between these two challenges: cost to the customer and convincing the customer of the authenticity of the Program. (In CY 2012, Trade Allies reported customer skepticism about the Program as the main challenge.) The Trade Allies reported that most customers agreed to the free energy assessment, with only two respondents reporting a refusal rate higher than 15%.

When asked about reasons for the refusal, most Trade Allies reported that the customers said they did not have time. Similarly, most Trade Allies reported they had high acceptance rates for Gold or Platinum packages from participating customers, with only three respondents stating that less than 90% of their customers purchased copay equipment.

When asked if there were ways Focus on Energy could help them increase the number of customers who install measures, Trade Allies said:

- Improve Program credibility with customers
- More utility involvement in recruitment efforts
- Operate the Program consistently for the entire year
- Provide a better recycling option for replaced lamps

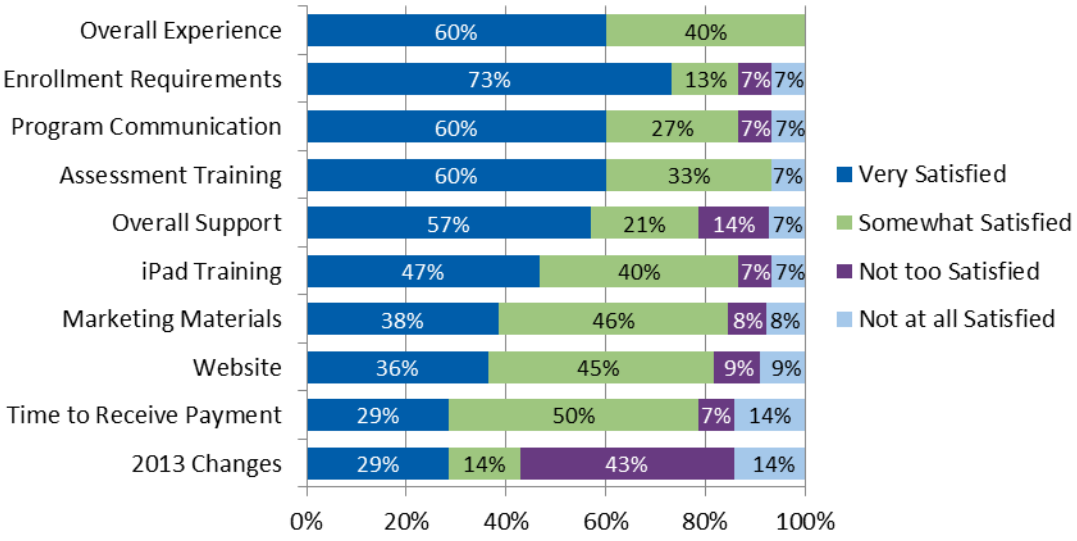
Program Satisfaction

The Evaluation Team asked Trade Allies questions about their satisfaction with several different elements of the Program (see Figure 191). The majority of Trade Allies reported they were "very satisfied" or "somewhat satisfied" overall and with most Program elements. The most notable area of dissatisfaction was with the CY 2013 Program changes, particularly with the reduced incentive amounts and measure offerings. To a lesser degree, Trade Allies also reported dissatisfaction with the timeliness of payment, the website, and marketing materials.

The Evaluation Team asked Trade Allies who gave lower than a "very satisfied" rating to give their reasons behind the ratings. Their responses included the following suggestions for Program improvement:

- Educate the public more about the Program.
- Increase communication from Energy Advisors.
- Continue processing timely payments (delayed payments were an initial problem that the Program Implementer improved by the end of CY 2013).
- Improve informative content in marketing materials and on the Focus on Energy website.
- Return Trade Ally incentive dollars to the CY 2012 levels.

Figure 191. Trade Ally Satisfaction Ratings with Key Program Elements



Source: Participant Trade Ally Interview Guide: 21. "I'm going to ask you about several different Program elements. For each, please tell me if you are very satisfied, somewhat satisfied, not too satisfied, or not at all satisfied." (n≥ 15).

When asked what actions Focus on Energy could take to improve the Trade Allies' Program experience, eight of 15 respondents said they could not think of anything that Focus on Energy could do to improve the Program. Seven Trade Allies, however, suggested that Focus on Energy keep the Program design the

same throughout the year, and three others suggested making the iPad application more user-friendly. Finally, five Trade Allies asked that the Program offer more LED options.

Program Cost-Effectiveness

Evaluators commonly use cost-effectiveness tests to compare the benefits and costs of a demand-side management program. The benefit/cost (B/C) test used in Wisconsin is a modified version of the total resource cost (TRC) test. Appendix I includes a description of the TRC test.

Table 219 lists the CY 2011-2013 incentive costs for the Small Business Program.

Table 219. Small Business Program Incentive Costs

	CY 2013	CY 2011-2013
Incentive Costs	$11,437,126	$13,743,553

The Evaluation Team found the CY 2013 Program to be cost-effective (a TRC benefit/cost ratio above 1). Table 220 lists the evaluated costs and benefits.

Table 220. Small Business Program Costs and Benefits

Cost and Benefit Category	CY 2013	CY 2012
Costs		
Administration Costs	$993,522	$340,285
Delivery Costs	$4,056,964	$1,389,527
Incremental Measure Costs	$23,973,682	$1,144,690
Total Non-Incentive Costs	$29,024,169	$2,874,503
Benefits		
Electric Benefits	$26,820,646	$8,657,438
Gas Benefits	$1,004,675	$251,468
Emissions Benefits	$10,007,622	$3,070,496
Total TRC Benefits	$37,832,943	$11,979,401
Net TRC Benefits	**$8,808,774**	**$9,104,899**
TRC B/C Ratio	**1.30**	**4.17**

Evaluation Outcomes and Recommendations

During the first full year of operation, the Program's savings met with the Implementer's expectations and the Program achieved high satisfaction with customers and Trade Allies. Through continued use of innovative and adaptive marketing and operational strategies developed in CY 2012, the Program attained high levels of customer participation and installation of purchased measure packages (beyond the Program's free offerings).

The Evaluation Team identified the following outcomes and recommendations to improve the Program.

Outcome 1. Despite multiple efforts to communicate midyear changes to the Program, Trade Allies reported confusion and dissatisfaction with these changes.

In response to increased Program volume at the end of CY 2012 and the beginning of CY 2013, the Program Implementer adjusted the offerings (following the CY 2012 extension) to ensure funding would last through CY 2013. The Program was successfully active for all of CY 2013. Although the Program Implementer preemptively informed Trade Allies and solicited their feedback to the proposed changes, some Trade Allies expressed confusion and dissatisfaction about the actions.

Recommendation 1. Continue proactive planning in collaboration with Trade Allies to ensure continued support, targets will be reached, and that funding will last the whole year.

- Continue to monitor Program activity to ensure funding and consistent Program structure throughout CY 2014.
- Communicate with Trade Allies early implementing midyear changes to the Program again, and give clear reasons for adjustments and any resulting deadlines.
- Facilitate midyear regional group meetings between Trade Allies, Energy Advisors, and the Program Implementer to share successes and challenges, and to discuss the future direction of the Program. This type of gathering, likely to be popular with Trade Allies and often timed as a breakfast meeting, promotes continued support, camaraderie among the Trade Allies, and a sense of commitment to the Program.

Outcome 2. The Program Implementer continues to maintain an effective Trade Ally network, though training and use of the iPad application are issues.

As in CY 2012, Trade Allies reported inconsistent experience with training and varying levels of engagement. In addition, some Trade Allies expressed concern over continued updates to the iPad software, which resulted in confusion or errors that the Program Implementer later caught; this confusion resulted in delaying data processing. Although some issues still exist, Trade Allies uniformly acknowledge positive communication and support from both the Program Implementer and Energy Advisors whenever needed.

Recommendation 2. Continue to refine the Trade Ally Program experience to ensure consistent training and to minimize changes to the iPad application process. When changes do occur to the iPad application, offer workshops or webinars to Trade Allies that allow for their feedback.[80]

[80] The Implementer reported creating a professionally-produced video for the purpose of Trade Ally training in 2014. This video includes iPad instructions, Program processes, and package descriptions.

Outcome 3. Although information on participating and partially participating customers is comprehensive, the Program Implementer does not have good information on customers who decline to participate in energy assessments.

Having information on customers who participate in energy assessments would help the Program Implementer and Trade Allies conduct follow-ups and for future activities that target nonparticipating customers and their experiences. Although Trade Allies report low Program awareness by customers, it is difficult to determine actual awareness without nonparticipant information. Understanding nonparticipating customers' knowledge of the Program could indicate the need for increased targeted outreach or improved Trade Ally sales training.

Recommendation 3. Require Trade Allies to collect customer information from the small businesses they approach but that decline to participate in the Program, then use this information to conduct a nonparticipating customer survey to understand and better serve this audience.

- Conduct a pilot test with a few Trade Allies, providing an incentive for them to collect nonparticipating customer information. Assess the Program to ensure data collection procedures are practical and result in minimal invasiveness for both customer and Trade Ally.
  - Use existing Trade Ally data collection tools like the iPad application to collect location, contact, and other basic information for customers who turn down the free energy assessment.
- Use collected information to conduct a survey with nonparticipating customers in future Program evaluations.

Outcome 4. SPECTRUM does not allow for automated batch entry of information available from the Program Implementer's database, resulting in the need to manually reenter application data.

This incompatibility increases the potential for error, causes a bottleneck in processing Program measure applications and payments, and duplicates work for the Program Implementer.

Recommendation 4. Continue to work with the SPECTRUM developer to implement a process to reduce redundancy in the application data-entry process.

Outcome 5. Per-unit deemed savings values are inconsistent for hybrid-type lighting measures.

The Evaluation Team observed that for prescriptive lighting measures, the per-unit deemed savings values were consistent. However, for hybrid lighting measures, the deemed savings values reported through SPECTRUM were variable.

Recommendation 5. Revisit deemed savings values for hybrid lighting projects and ensure that per-unit savings are appropriately applied.

Outcome 6. Baseline information for replaced measures was difficult to obtain.

Project invoices did not include baseline information for replaced measures. Additionally, during the surveys of sampled participants, only a few respondents could recall the baseline equipment information.

Recommendation 6. Require Program contractors to track baseline information for the replaced measures during the retrofit process. Evaluators can then use this information for more accurate assumptions and deemed values in the future.

Outcome 7. Actual hours of operation for the commercial sector was consistent with deemed.

The Evaluation Team reviewed hours of operation on project invoices and through telephone surveys for all three sectors. Only the commercial sector had enough sample points to draw any conclusions. The Evaluation Team found average hours of operation for the commercial sector to be 3,720. The deemed value used to calculate Program savings was 3,730.

Recommendation 7. Maintain the deemed value of hours of operation for the commercial sector but continue to review updated studies or other information that would provide a greater level of confidence in this value.

Retrocommissioning Program

The Retrocommissioning Program (Program) provides nonresidential customers with financial assistance to improve energy efficiency when they optimize existing building systems, energy-using equipment, and operating schedules in their facilities. Focus on Energy launched the Program in late CY 2012 and began claiming savings in CY 2013.

CB&I administers the Program by providing general programmatic oversight. The Program Implementer, CLEAResult, trains Trade Allies to provide Program services, recruits participants, and provides technical engineering services to approve project-level forecasted and *ex post* energy savings. Trade Allies, the Retrocommissioning Service Providers and Technical Service Providers, deliver Program services to customers.

The Program has two paths: a core retrocommissioning path and an Express Building Tune-Up path. The core path tends to serve larger facilities and includes more customized measures. The Retrocommissioning Service Providers work on the core retrocommissioning path projects. The Express Building Tune-Up path relies more on a prescriptive approach to building system enhancements. The Technical Service Providers work on the Express Building Tune-Up projects.

Table 221 lists the Retrocommissioning Program's CY 2013 spending, savings, participation, and cost-effectiveness for both paths.

Table 221. Retrocommissioning Program Actuals Summary

Item	Units	CY 2013 Actual Amount
Incentive Spending[1]	$	$ 258,994
Verified Gross Life-Cycle Savings	kWh	14,336,177
	kW	225
	therms	1,428,476
Net Annual Savings	kWh	2,849,745
	kW	225
	therms	280,706
Participation	Unique Customers	19
	Unique Projects/Applications	24
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	1.58

[1]Incentives spending as noted in SPECTRUM for projects contributing savings in CY 2013.

Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted impact and process evaluations for CY 2013 for the Retrocommissioning Program. The following research questions directed the design of the EM&V approach:

- What are the verified gross and net electric and gas savings?
- How effective and efficient are the Program's operations?
- How can the Program's delivery processes cost-effectively increase its energy and demand savings?
- How effective are the Program's marketing, outreach, and communication efforts in reaching targeted customers and influencers?
- What are the barriers to increased customer participation, and how effectively is the Program overcoming these barriers?
- How satisfied are customers and Trade Allies with the Program?
- Is the Program meeting cost-effectiveness requirements?
- How can Focus on Energy improve Program performance?
- How did the Program's achievements compare with retrocommissioning incentive programs elsewhere?
- How reasonable were the documentation requirements for Trade Allies, the Program Implementer, and participants?
- What were the challenges and successes with ramping up the Program in its first year?

Data Collection Activities

The Evaluation Team designed its EM&V approach to integrate multiple perspectives in assessing Program performance. Table 222 lists the specific data collection activities and their samples sizes.

Table 222. Retrocommissioning Program CY 2013 Data Collection Activities and Sample Sizes

Activity	CY 2013 Population Size (n)	CY 2013 Sample Size (n)
Impact		
On-Site Verification	24[1]	10
Process		
Participant Surveys	19[2]	13
Trade Ally Interviews	101[3]	20
Administrator/Implementer Interviews	5	4

[1]The population for on-site verifications is the number of applications.

[2]The population for participant surveys is the number of unique participants.

[3]Trade Allies include 37 Retrocommissioning Service Providers and 64 Technical Service Providers.

Impact Evaluation

The impact evaluation activities involved reviewing the Program database (SPECTRUM) to develop a representative sample of projects, reviewing Program documentation for the sampled sites, and conducting site visits. During the site visits, the Evaluation Team verified the installed energy-efficiency measures, collected data for the impact analysis, and surveyed the site participants about the installed measures.

Program Database Review

To plan the impact evaluation, the Evaluation Team reviewed SPECTRUM for project status and measure data. Details on review process and findings are included in the Impact Evaluation section.

Review Program Documentation for Sampled Sites

The Evaluation Team compiled the project documentation for the sample. These included incentive application forms, savings workbooks, copies of invoices, and relevant correspondence. Details on the review process and findings are detailed in the Impact Evaluation section.

Conduct Site Visits

In January 2014, the Evaluation Team coordinated visits to the 10 sample sites. Table 223 lists the gross Program savings contributions for the core retrocommissioning and Express Building Tune-Up measure groups. Table 224 lists the impact evaluation activities by measure group. Although only 54% of the applications were from the core retrocommissioning path, these projects represented 92% of the savings.

Table 223. Retrocommissioning Program Gross Savings Contribution by Measure Group

Measure Group	Percentage of Savings		
	(kWh)	(kW)	(Therms)
Core Retrocommissioning—HVAC, Not Otherwise Specified	93%	100%	92%
Retrocommissioning, Express Building Tune-Up	7%	0%	8%
Total	**100%**	**100%**	**100%**

Table 224. Retrocommissioning Program Impact Activities by Measure Group

Measure Group	Population: Completed Projects (Applications)	Project Audit	Site Visit	Total Analyses[1]
Core Retrocommissioning – HVAC, Not Otherwise Specified	13	5	5	5
Retrocommissioning, Express Building Tune-Up	11	5	5	5

Total	**24**	**10**	**10**	**10**

[1]Five applications for the core retrocommissioning and five applications for the Express Building Tune-Up were included in the sample. For each application, the Evaluation Team reviewed Program documentation and conducted a site visit.

Process Evaluation

The main data collection activities for the process evaluation were Program Administrator and Implementer interviews, Trade Ally interviews, and participant surveys.

Program Administrator and Implementer Interviews

The Evaluation Team interviewed the Program Administrator and three Program Implementer staff for a total of four interviews. The Implementer staff included one overall lead, one point person for the core retrocommissioning projects, and one point person for Express Building Tune-Up projects.

Trade Ally Interviews

Although the Program Implementer provided contact information for 37 Retrocommissioning Service Providers and 64 Technical Service Providers, most were not active or registered with the Program. The Evaluation Team had a primary goal of speaking with active and non-active Trade Allies. Active Trade Allies who had completed a project within the CY 2013 Program cycle or had a project in progress were defined as active.

In October 2013, the Evaluation Team interviewed all seven active and a random sample of five non-active Retrocommissioning Service Providers (n=12). The Evaluation Team also completed interviews with eight of the nine active Technical Service Providers (n=8). In all, the Evaluation Team completed phone interviews with 20 Trade Allies.

Participant Surveys

The Evaluation Team contacted all Program participants who were listed in the Focus on Energy database and had completed projects as of December 10, 2013, and asked them to participate in a survey. In some cases, the same organization had conducted several retrocommissioning projects. Table 225 lists the number of completed projects, unique participants, and completed surveys by project path.

Table 225. CY 2013 Completed Retrocommissioning Program Participant Surveys

Project Path	Population			Sample
	Completed Participant Facilities	Completed Participant Projects (Applications)	Unique Participants	Completed Surveys from Unique Participants
Core Retrocommissioning	11	13	10	7
Express Building Tune-Up	10	11	9	6
Total	**21**	**24**	**19**	**13**

Multiple decision-makers are often involved in retrocommissioning building projects. To ensure the most comprehensive data were collected, the Evaluation Team interviewed two participants from each project whenever possible—a financial decision-maker and a facilities representative. In these cases, the multiple interviewees joined the same conference call, and both parties contributed to the responses about their organization's participation in the Program. (Note that in the findings discussion, the Evaluation Team considered each company as a single respondent, even if more than one person participated in the survey.)

Impact Evaluation

To calculate gross savings, the Evaluation Team reviewed the Program tracking data and then combined these with data from the site visits and documentation reviews. To calculate net savings, the Evaluation Team used participant survey data to determine freeridership and spillover.

Evaluation of Gross Savings

This section describes how the Evaluation Team assessed gross Program savings.

Tracking Database Review

The Evaluation Team reviewed the CY 2013 data contained in the SPECTRUM database for completeness and quality. The data were thorough and complete; SPECTRUM contained all of the data fields necessary to evaluate the Program. The Program Implementer categorized three of the pilot Express Building Tune-Up application forms under the core retrocommissioning path in the database. For the impact evaluation, the Evaluation Team included the pilot applications with the other Express Building Tune-Up application forms. The Evaluation Team also found a few minor typos in the database entries where the savings values did not match the detailed Program documentation. These had a negligible impact on the overall Program numbers.

Site Visit Sample Development

Based on the expected Program participation levels, the original evaluation plan specified conducting up to 10 site visits to CY 2013 participants, targeting a 90% confidence level with ±10% precision. However, participation started slowly and, partway through the year, the Evaluation Team revised the plan to postpone any site visits and roll the budget into CY 2014. Toward the end of CY 2013, because

participation had increased, the Evaluation Team reversed that decision and conducted site visits with CY 2013 participants. Due to the low population size, and corresponding low contribution to the overall savings claimed by the Focus on Energy Programs in total, the Evaluation Team used a revised target of 90% confidence with ±20% precision to determine the final sample size for CY 2013.

To plan the impact evaluation, the Evaluation Team reviewed the SPECTRUM database for project status and measure data. The total population comprised implemented projects with incentives paid out in CY 2013. SPECTRUM listed applications processed under the core retrocommissioning path as the measure group "HVAC, Not Otherwise Specified" and listed applications processed under the Express Building Tune-Up path as "Retrocommissioning, Express Building Tune-Up." Database fields for both paths listed customer, site, and application. In some cases, if a customer owned multiple sites, the Program Implementer processed multiple applications for a site.

The Evaluation Team considered the total population (N=20) to be the projects for which Focus on Energy paid incentives. Effective the end of CY 2013, the Program Administrator had paid incentives for 13 core retrocommissioning applications and seven Express Building Tune-Up applications. Because three of the core applications were conducted as pilots of the Express Building Tune-Up path, the Evaluation Team analyzed them with the other Express Building Tune-Up projects.

To set up the evaluation sample structure, the Evaluation Team used the incentive payment as a proxy for energy savings, and selected the two largest projects, both from the core path. The Evaluation Team split the remaining applications into two strata, one for the balance of the core applications and a second for the Express Building Tune-Up applications. The Evaluation Team selected a random sample in each stratum to fulfill the revised precision and confidence targets (90% and ±20%). The sample included the two largest applications, three applications in the core retrocommissioning stratum, and four applications in the Express Building Tune-Up stratum.

Review Program Documentation for Sampled Sites

The Evaluation Team compiled the project documentation—incentive application forms, savings workbooks, copies of invoices, and relevant correspondence—for the sample. The core retrocommissioning files contained the projects' savings workbooks for the preliminary investigation and updated workbooks that reflected adjustments made during the post-implementation verification phase. These workbooks recorded project-specific information such as general site information, summaries of savings, measure descriptions, and back-up documentation for both pre- and post-implementation.

The Express Building Tune-Up workbooks were more streamlined than the core retrocommissioning workbooks and did not record system details or measure-related backup documentation.

Conduct Site Visits

The Evaluation Team contacted the customers in the sample to coordinate the site visits. Two of the customers with selected sites declined to participate; one of these customers had two applications (one

in the census and one in the core retrocommissioning stratum). This customer was not able to provide on-site support and access to the facility due to operations staff vacation schedules. The other customer who declined the site visit had one application in the Express Building Tune-Up stratum. The site contact did not indicate a specific reason for not participating and did not respond to the Program evaluation survey.

The Evaluation Team replaced these two sites with three randomly selected sites. The first site had two applications in the core retrocommissioning stratum. The second and third sites each had one application in the Express Building Tune-Up stratum. The changes to the sample did not appear to bias the analysis because the overall sample still represented a broad range of projects conducted by a variety of Trade Allies.

In January 2014, the Evaluation Team conducted site visits. The Evaluation Team noted that during the site visits, the majority of site contacts commented on the number of site visits to check results that had occurred under the Program.

In early February 2014, after conducting the site visits, the Program Implementer provided the Evaluation Team with updates to the SPECTRUM database. The updates included additional applications the Program Implementer had completed and processed before the end of year, which impacted the total population. The number of completed and paid applications increased the total population from 20 sites to 24. After combining the change in population size and the change in the sample sites, the Evaluation Team calculated verified gross savings values at 90% confidence with ±19% precision.

Gross and Verified Gross Savings Analysis

The Evaluation Team used the Program data and documentation as well as data observed and collected during the site visits to determine the verified gross savings at the site level. Using the verified gross savings, the Evaluation Team calculated each path's realization rate (explained under the Realization Rate subheading), which it then applied to the non-sampled applications to determine the Program-level verified gross savings.

Engineering Review

The Evaluation Team conducted engineering reviews and evaluated the reported gross electric and gas savings using information from the Program database with information supplied by the Program Administrator. For each site in the sample, the Evaluation Team conducted an initial review of the savings methodology and calculations developed by the Trade Allies and provided in the Program documentation. Detailed workbooks documenting the basis of the gross energy savings reported for the program were provided. If the Evaluation Team agreed with the methodology and calculations used for the initial analysis, it revised the calculations with any new data collected from the site visits, such as trend data, observations from the site visit, and interviews with site staff. If the Evaluation Team did not agree with the methodology and calculations, it performed an independent savings analysis.

In general, the Evaluation Team was able to follow the logic of the calculations because there was sufficient detail in the core retrocommissioning applications and data collected by the Trade Ally during the project's verification phase.

The Express Building Tune-Up workbooks contained less detailed information about the sites and site-specific measures than the core retrocommissioning workbooks. The Program Implementer designed these workbooks to support a streamlined analysis process with minimal data input from the Technical Service Provider; however, this design made it more difficult to accurately interpret how participants implemented the measures and calculated savings. On several applications, the Evaluation Team noted that Program Implementer further customized workbook calculations for the site.

In general, the Evaluation Team was more likely to use independent analysis than the original savings methodology for the Express Building Tune-Up applications to determine the project-level verified gross savings.

For each Program path, the Evaluation Team verified gross savings and calculated realization rates for electric energy, electric demand, gas, and total energy. The Evaluation Team calculated the verified gross savings for each measure on a sampled project from the core retrocommissioning path and then combined the gross savings for each measure to determine the gross verified savings for that project. The Evaluation Team then totaled the verified gross savings for the sampled core retrocommissioning projects. The Evaluation Team also totaled the reported gross savings from the Program documentation for the sample sites. To calculate the realization rate for the core retrocommissioning path sample projects, the Evaluation Team divided the total of the verified gross savings by the total of the reported gross savings. To calculate the total verified gross savings for the core retrocommissioning path, the Evaluation Team multiplied the realization rates by the total gross savings for the projects not included in the sample. The Evaluation Team used a similar process for the Express Building Tune-Up path.

The Evaluation Team then combined the path-level verified gross savings to calculate the overall Program-verified gross savings and realization rates.

Realization Rates

Overall, the Program achieved an evaluated realization rate of 101%, which verified that the gross savings reported in the tracking database were achieved in accordance with the evaluation criteria.

Table 226 lists the realization rates by path and energy category. The Evaluation Team found that although the Program met its overall goal for the realization rate, the energy categories varied for the two paths. In general, the core retrocommissioning *ex post* savings were slightly below the *ex ante* savings projections, for a total realization rate of 95%. This rate can be attributed to one of two possibilities: (1) measures that were no longer delivering savings at the time of the impact evaluation visits, or (2) savings calculations the Evaluation Team determined were overly aggressive based on observations during the impact evaluation visits.

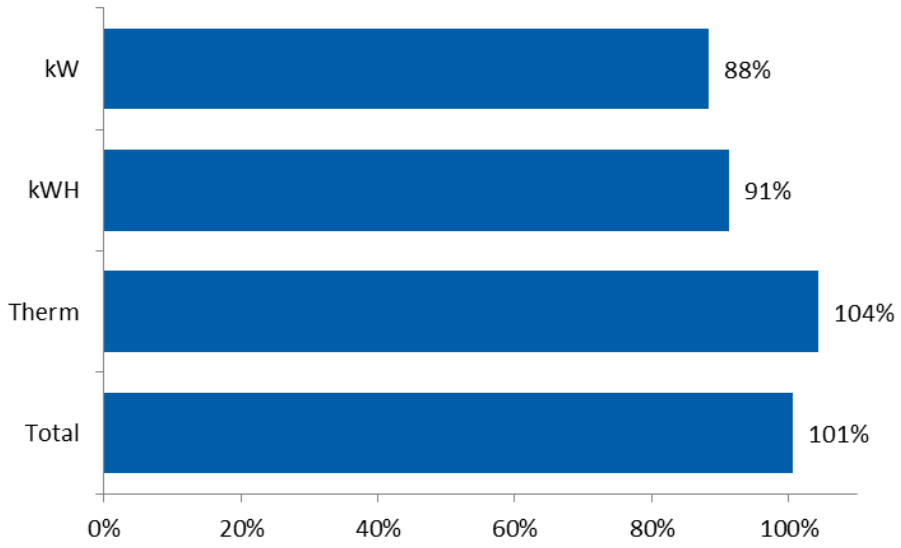
The realization rate was fairly consistent across the energy categories for the core retrocommissioning path, as Table 226 shows. The Express Building Tune-Up savings showed much wider variation per project and per energy category. For example, one site yielded 0% realization for *electric* savings, another showed 0% realization for *gas* savings, and a third site yielded 372% realization for gas savings. The wide variation in the Express Building Tune-Up sites is related to the project documentation issues previously noted in Engineering Review section.

Table 226. Retrocommissioning Program Realization Rates by Measure Group

Measure Group	Realization Rate			
	kWh	kW	Therms	MMBtu
Core Retrocommissioning—HVAC, Not Otherwise Specified	93%	88%	95%	95%
Retrocommissioning, Express Building Tune-Up	72%	N/A	219%	180%
Total	**91%**	**88%**	**104%**	**101%**

Figure 192 shows the realization rate by fuel type.

Figure 192. Retrocommissioning Program Realization Rate by Fuel Type



Gross and Verified Gross Savings Results

Table 227 lists the Retrocommissioning Program's total and verified gross savings, by measure type, in CY 2013.

Table 227. CY 2013 Retrocommissioning Program Gross Saving

Retrocommissioning Savings Type	Gross			Verified Gross		
	kWh	kW	Therms	kWh	kW	Therms
Annual Core Retrocommissioning	2,924,659	255	254,109	2,714,687	225	242,184
Life-Cycle Core Retrocommissioning	14,623,297	255	1,270,544	13,573,437	225	1,210,918
Annual Express Building Tune-Up	212,217	N/A[1]	19,856	152,548	0	43,512
Life-Cycle Express Building Tune-Up	1,061,087	N/A[1]	99,279	762,740	0	217,558
Total Annual	**3,136,877**	**255**	**273,965**	**2,867,235**	**225**	**285,695**
Total Life-Cycle	**15,684,385**	**255**	**1,369,823**	**14,336,177**	**225**	**1,428,476**

[1]Due to the nature of the measures implemented under the Express Building Tune-Up path, the Evaluation Team did not include demand savings.

Evaluation of Net Savings

This section describes Evaluation Team's approach to calculating net savings.

Net-to-Gross Analysis

This section provides findings and commentary specific to the Business Incentive Program. For a detailed description of net-to-gross analysis methodology, please refer to Appendix L.

Freeridership Findings

The Evaluation Team used the self-report approach to determine the Program's freeridership level.

Overall, the Program had an average freeridership of 1.6% across all respondents. However, the determined level of freeridership is within the expected range of error and, therefore, is not statistically significant. (Please refer to Appendix K for more information on confidence and precision.)

Table 228 lists freeridership results by Program path. The population (n) in the table is based on the number of applications from the 16 survey respondents; note that some respondents had more than one application.

Table 228. Retrocommissioning Program Freeridership Estimates

Measure Group Name	n	Freeridership Estimate
Core Retrocommissioning—HVAC, Not Otherwise Specified	9	0%
Retrocommissioning, Express Building Tune-Up	7	15.6%
Overall	**16**	**1.6%**

Out of the 16 participants surveyed, the Evaluation Team could assign freeridership to only two survey sites for measures installed under the Program. One survey respondent reported there were plans to retrocommission the facility; however, funding was not yet allocated in the capital budget, so the Program helped the project proceed. Another respondent said there were plans to retrocommission the facility and an established budget, but the Program changed the way the facility approached the process by providing a more comprehensive assessment than it would have otherwise. Most of the participants were directly influenced to retrocommission their facilities as a result of the Program.

Spillover Findings

Based on interviews with staff during site visits, the Evaluation Team did not credit any spillover to the Program. Several respondents reported that following their participation in the Program they have pursued other Focus on Energy programs, but any associated energy savings will be captured in these programs and therefore do not qualify as spillover.

Net-to-Gross Ratio

The overall Retrocommissioning Program net-to-gross estimate is 98.4%, as Table 229 shows.

Table 229. CY 2013 Retrocommissioning Program Freeridership, Spillover, and Net-to-Gross Estimates[1]

Measure Type	Freeridership	Spillover	Net-to-Gross
Overall	1.6%	0%	98.4%

[1] The Evaluation Team weighted the overall value by the distribution of evaluated gross energy savings for the Program population.

Net Savings Results

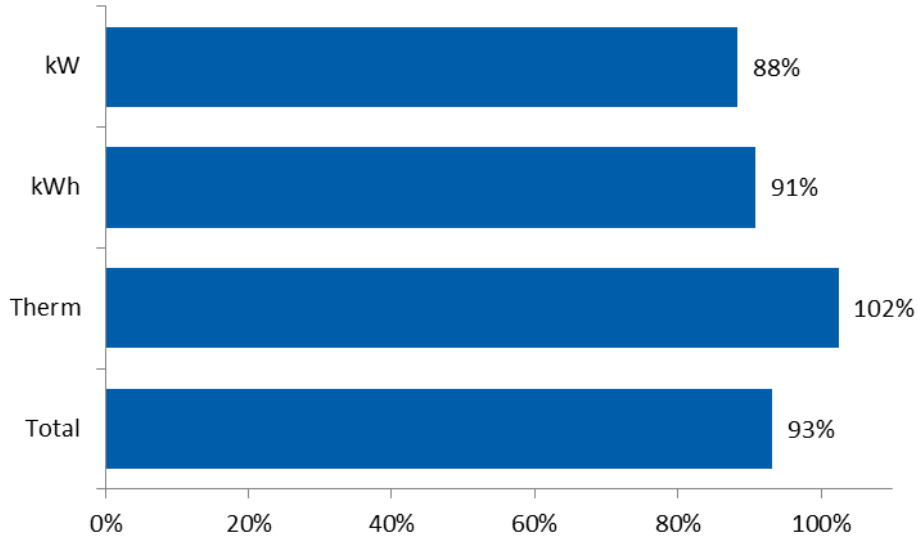
Table 230 shows the net energy impacts (kWh, kW, and therms) for the Retrocommissioning Program. The Evaluation Team attributed these savings net of what would have occurred without the Program.

Table 230. Retrocommissioning Program Net Savings

	Verified Net		
	kWh	kW	Therms
Annual	2,849,745	225	280,706
Life-cycle	14,248,723	225	1,403,531

Figure 193 shows the net savings as a percentage of the *ex ante* gross savings by fuel type.

Figure 193. Retrocommissioning Program Net Savings as a Percentage of *Ex Ante* Savings by Fuel Type



Process Evaluation

This section presents the key findings from the process evaluation of the Retrocommissioning Program. To assess the Program's effectiveness in reaching its objectives, the Evaluation Team relied on data collected through the four Program Administrator and Implementer interviews, 13 participant surveys, and 20 Trade Ally interviews with Retrocommissioning Service Providers who work on the core retrocommissioning path and Technical Service Providers who work on the Express Building Tune-Up path. The Evaluation Team also conducted research to compare the Program with other retrocommissioning incentive programs.

Program Design, History, and Goals

The Program serves customers in the commercial, industrial, government, nonprofit, and education sectors. Its key objective is to emphasize implementation of energy-savings retrocommissioning measures. The Program offers incentives for retrocommissioning measures with short payback periods.

Focus on Energy launched the core path for the Retrocommissioning Program in October 2012 to give customers an opportunity to achieve deep energy savings through building system improvements that enhance operational efficiency. In June 2013, Focus on Energy launched the Express Building Tune-Up path for small-scale retrocommissioning projects. The two paths differ in their incentive structures. Customers who complete core projects receive the incentives directly, and Trade Allies receive the incentives for Express Building Tune-Up projects.

Program Objectives and Incentive Structures

Core Retrocommissioning Path

Incentives for core projects are performance-based, which minimizes the risk that customers will contract audits but not implement the recommended measures. The Program pays customers incentive

in three phases: the audit incentive, the verified-measure incentive, and the persistence incentive (see Table 231). The Program launched the audit incentive in the middle of CY 2013. The audit incentive is 50% of the forecasted verified measure implementation incentive that is based on the audit's findings. Customers are still responsible for the full cost of the audit. The Program's bonus persistence incentive is an additional mechanism that emphasizes long-term, persistent energy savings.

Table 231. Program Incentive Structure (Core Path)

Incentive Phase	Incentive	Payment Phase	Timing
Retrocommissioning Audit incentive (Part 1)[1]	$0.04/kWh $0.20/therm	First Payment	Delivered after savings calculations are finalized and Incentive Agreement is signed
Verified Measure Implementation incentive (Part 2)[2]	$0.02/kWh $0.15/therm	Second Payment	Delivered after measure installation has been verified
Persistence Incentive	$0.02/kWh $0.15/therm	Third Payment	Delivered 90 days after the project has been installed and the persistence has been verified by Retrocommissioning Service Provider
Total Incentive	**$0.08/kWh $0.50/therm**		

[1] Capped at 75% of the audit cost. Based on estimated energy savings opportunities discovered in the Retrocommissioning Audit.

[2] Capped at the 50% of documented implementation costs. Rate is only applicable to installed measures. The incentive is based on energy savings documented through a verification study performed by the Retrocommissioning Service Provider.

Express Building Tune-Up Path

Focus on Energy introduced the Express Building Tune-Up path to leverage the existing Trade Ally network, earn savings for the Retrocommissioning Program, and provide cost-effective savings for customers from express tune-ups (mainly geared toward building HVAC systems). This path is a prescriptive, simple, and expedited process to achieve savings through mechanical tune-ups of building operating systems that do not require long-term data trending or in-depth building audits.

The Administrator and Implementer staff said that the key objective of the Express Building Tune-Up path was to design a mechanism whereby the Program could achieve savings more rapidly than typical long-term retrocommissioning projects. Staff also said this path was intended to achieve savings opportunities usually missed in small buildings.

The cost to the customer is a flat rate of $250 for a building walk-through and system adjustments. Focus on Energy pays the incentives in this path directly to Trade Allies.

The Program Implementer and Program Administrator reported that, overall, the launch of the Express Building Tune-Up path was successful at recruiting and training Trade Allies and quickly setting up the Program infrastructure. There were, however, several obstacles that inhibited rapid uptake of this "simplified retrocommissioning" in the marketplace. The Management and Delivery Structure section discusses these obstacles in more detail in.

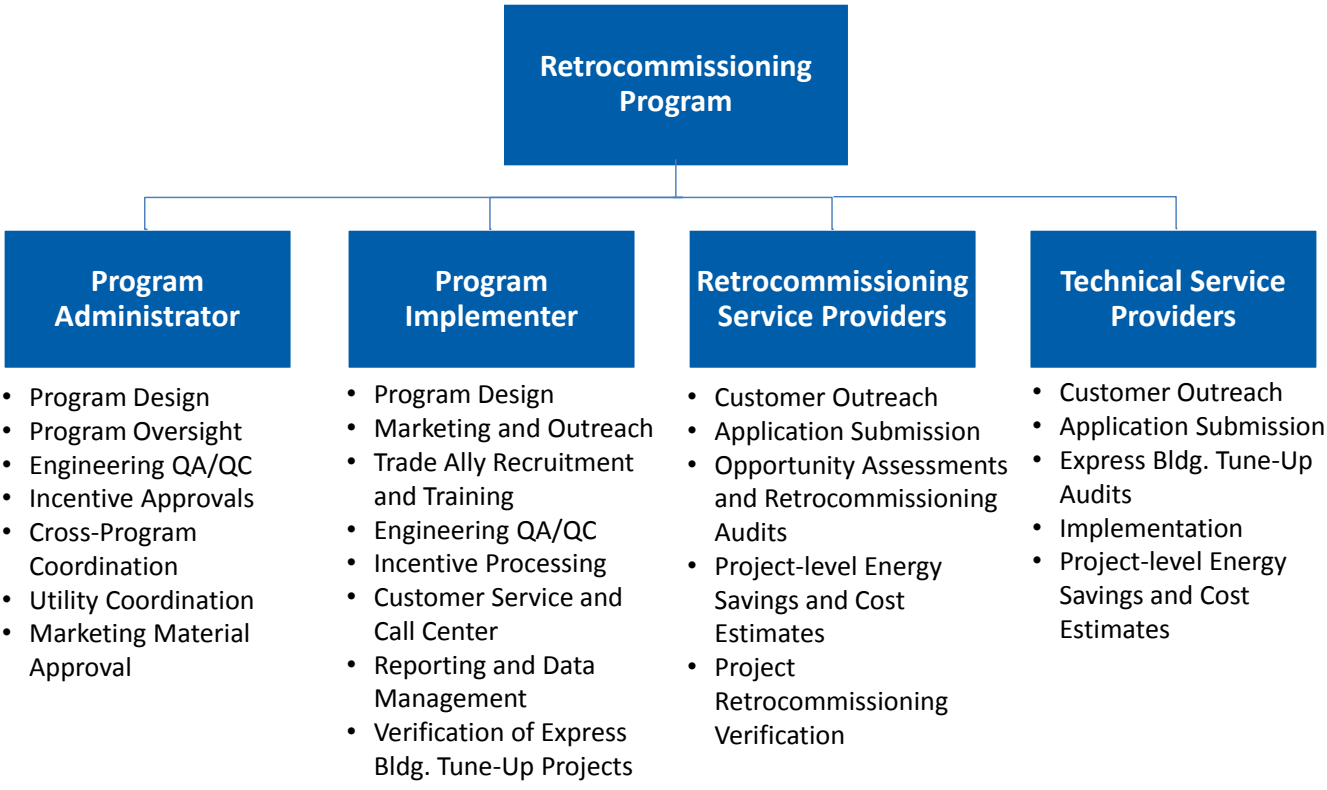
Program Management and Delivery

This section describes the various aspects of Program management and delivery.

Management and Delivery Structure

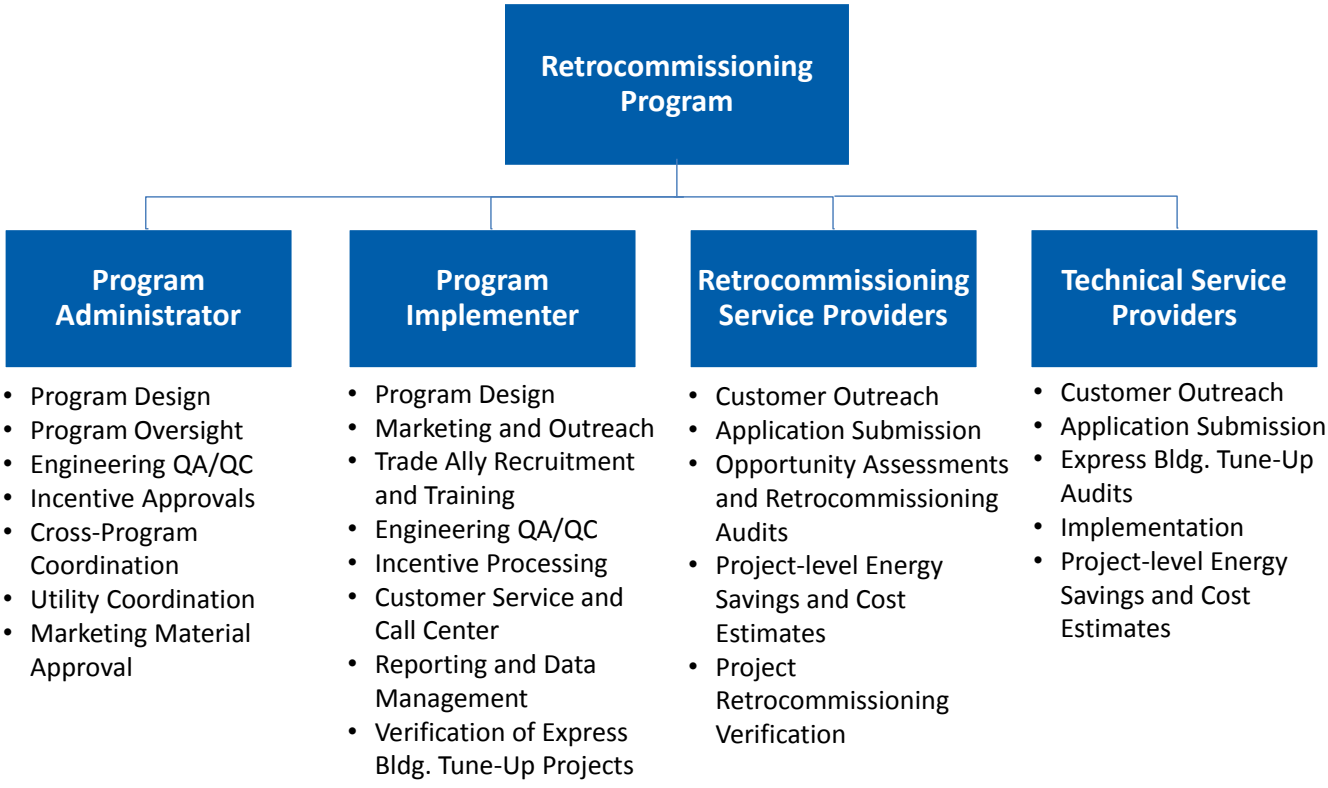
As previously discussed, the following four key actors interact in the Retrocommissioning Program:

- The Program Administrator
- The Program Implementer
- Trade Allies, the Retrocommissioning Service Providers and Technical Service Providers
- Participants



defines the role for each of the key actors in the Retrocommissioning Program.

Figure 194. Retrocommissioning Program Actors



The core and Express Building Tune-Up paths of the Program have different implementation strategies and delivery mechanisms.

Core Path Delivery

The Program was designed to take advantage of market forces and to heavily invest in upstream market actors to garner energy savings. The Program Implementer's role was to recruit, train, and maintain a substantial network of approved Retrocommissioning Service Providers to engage customers and to become key players in delivering Program services. The Program Implementer reported that although it had built a roster of 37 Retrocommissioning Service Providers, just 12 worked on Program projects in CY 2013, either completed or still in the pipeline.

In interviews with the Program Administrator and the Implementer, both agreed the Program Implementer, not the Retrocommissioning Service Providers, primarily engaged participants as the Program geared up. Both also said their goal was to begin shifting more Program delivery and participant recruitment to the Retrocommissioning Service Providers.

Implementer staff reported that utility Key Account Managers are not an explicit part of their delivery strategy, but they do coordinate with them when conducting outreach for the Program and recognize

the benefit of personal relationships that they have with customers. One Implementer staff said, "If I can get a lead from them or they will come to the meeting, that's all I expect."

Express Building Tune-Up Path Delivery

The Express Building Tune-Up path relies heavily on Technical Service Providers, which are mechanical contractors the Program Implementer has trained to provide Program services. The Implementer is much less involved with customer interactions and project guidance. It recruited the Technical Service Providers from the existing Focus on Energy Trade Ally network, based on their specialization or expertise in HVAC and controls, and then trained them for the Program.

Delivery Challenges and Solutions

The Program Administrator and Program Implementer reported that challenges with the workbook, incentive structure, marketing and outreach, and market factors all contributed to a slow start of the Program in CY 2013. Table 232 summarizes these challenges, along with their solutions, and the status of those solutions. Appendix S provides further details on these challenges.

Table 232. Challenges and Solutions to Program Delivery

Area	Challenge/Barrier	Solution	Status
Workbook	• Confusion about energy savings calculations and workbook approval process between the Program Implementer and Administrator	• Change in key personnel responsible for workbook development and QA/QC • Enhance rigor/improved quality of savings forecasts • Improve communication and coordination	• Implemented • Implemented • Ongoing
Incentive Structure	• Customers unwilling to bear upfront cost of retrocommissioning audit and measure implementation	• Alter incentive structure to provide 50% of forecasted incentive up front at time of Incentive Agreement	Implemented
Incentive Structure	• Customer hesitancy to participate before being shown energy savings (before audit) • Skepticism of incentive amount	• Alter Program process to provide Enhanced Opportunity Assessment • Focus on Energy pays the Retrocommissioning Service Provider to conduct a more detailed walk-through of a customer's facility and utility bill analysis if needed, before the audit stage	Implemented
Marketing and Outreach	• Engaging other Focus on Energy implementers to refer "good candidates" to the Retrocommissioning Program	• Work with other implementers to make sure they understand the Program and the value to Focus on Energy customers • Provide reciprocal referrals for programs such as the Business Incentive Program, Large Energy Users, and Chains, Stores & Franchises • Better coordination on projects ahead of time to determine best program fit	Implemented
Marketing and Outreach	• Engaging utility representatives to refer customers to the Program	• Work with utility Key Account Managers to make sure they understand the Program and the value to their customers	Ongoing
Marketing and Outreach	• Engaging Retrocommissioning Service Providers to market the Program to their customers	• Train personnel on Program promotion and marketing • Refine Retrocommissioning Service Provider network to focus time and energy on providers that are active in the Program and have local capacity in Wisconsin	• Implemented • Planned
Market Factors	• Seasonal fluctuation and competition for mechanical contractors' time for Express Building Tune-Up path	• Communicate the business case and value proposition of the Program	Ongoing

Program Data Management and Reporting

Program Implementer staff enter all project data in SPECTRUM. Data collected and reported include customer and Trade Ally contact information, projected and actual incentive levels, projected and actual energy savings, and other project status details. Implementer staff also uploads supporting project files, such as project workbooks, calculation tools, and Incentive Agreements, into the SPECTRUM database. The Program Implementer did not report any challenges with using SPECTRUM.

Marketing and Outreach

The Evaluation Team reviewed the marketing efforts for the Program and assessed the effectiveness of various recruitment strategies and messaging tactics. The Program's main channel for recruiting participants is through Retrocommissioning Service Providers, Technical Service Providers, and the Program Implementer.

Marketing Materials

The Program Administrator developed a detailed factsheet for each Program path for the Trade Allies and the Program Implementer to use when promoting the Program to its customers. One of the Trade Allies, a Retrocommissioning Service Provider, also reported using his own case studies.

How Participants Learned about the Program

Of 13 participant respondents, seven heard about the Program through a Trade Ally and three from the Program Implementer staff. However, the Express Building Tune-Up respondents more frequently heard about the Program from a Trade Ally (five of six) than did the core path respondents (two of seven). Respondents also reported hearing from utility representatives and energy advisors.

Trade Ally Marketing Activity

Ten of 12 Retrocommissioning Service Providers and six of eight Technical Service Providers reported recommending the core retrocommissioning and Express Building Tune-Up paths to their customers, respectively. Of those recommending the Program to their customers, most reported having connected with only a small percentage of their customer base. Overall, most Trade Allies reached their customers through direct contact, with mass e-mailing, presentations at client events and other channels being much less frequent, as shown in Table 233.

Table 233. Trade Ally Marketing Communication Channels

Marketing Channels	Retrocommissioning Service Providers		Technical Service Providers (n= 8)	Total
	Active (n=7)	Non-Active (n=5)		
Direct Contact (phone calls or meetings with clients)	5	2	5	**12**
E-mails to Clients	2	1	0	**3**
Focus on Energy Website	1	1	0	**2**
Presentations	1	1	0	**2**
Distribute Focus on Energy Materials During Site Visits	1	0	0	**1**
Direct Mail	0	0	1	**1**
Case Studies[1]	1	0	**0**	**1**

[1] This respondent said he developed his own case studies for buildings retrocommissioned by his firm.

When asked what other promotion services they needed from the Program Implementer, Retrocommissioning Service Providers said they would like to receive the following:

- Case studies with real energy savings figures (four of 12)
- An updated service provider manual or technical guide to include samples of workbook calculations and measures (two of 12)
- Helpful sales and educational materials such as a pamphlet to show consultants and owners the start-to-finish process of retrocommissioning (one of 12)
- Cobranding opportunities, such as a sticker or use of a logo to allow Retrocommissioning Service Providers to illustrate they are part of the Program (one of 12)

Technical Service Providers asked for further marketing materials that would help them promote the Program.

Reasons for Not Marketing the Program

Four Trade Ally respondents (two Retrocommissioning Service Providers and two Technical Service Providers) reported they were not actively recommending the Program to their customers. One Retrocommissioning Service Provider reported that he wanted to complete one project first before recommending it to future clients. The other said that his method of retrocommissioning does not match Program requirements so he had not recommended the Program to clients. He suggested if the Program were changed to accommodate energy service companies, then he would be more likely to participate in the future. He did not provide more detail as to how the Program could accommodate energy service companies.

Two Technical Service Providers reported that the Program requirements were too burdensome to participate; one specifically said that he was not recommending the Program due to his experience with the workbook.

Customer Experience

This section covers findings on Program satisfaction, participant decision-making, persistence, and challenges that affect customer participation.

Program Satisfaction

Most participants were highly satisfied with the overall Program, its components, and the Program Implementer and Trade Allies. For those who were less than satisfied, complaints arose mostly from a lack of consistency in Program staff and inconsistency between project savings and incentive payment forecasts.

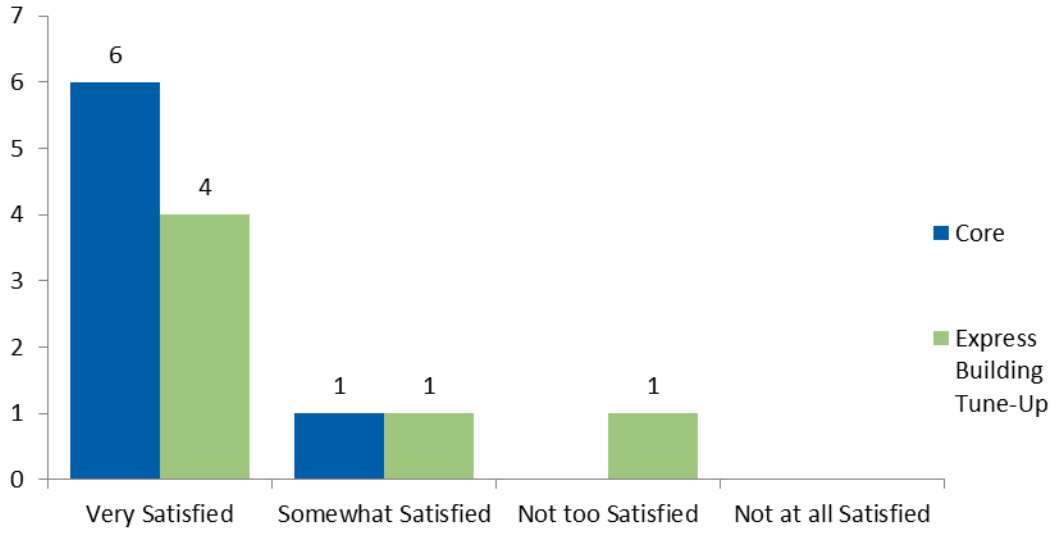
Satisfaction with Overall Program

For both the core and Express Building Tune-Up paths, the majority of participants were "very satisfied" with their overall Program experience (10 of 13).

As Figure 195 illustrates, nearly all core participants were "very satisfied" with the Program (six of seven). Four participants in this group specifically told the Evaluation Team how satisfied they were with cost savings since completing the project.

Of the Express Building Tune-Up participants who were "somewhat satisfied" (one of six) and "not too satisfied" (one of six), one was still working out project kinks and one was waiting to get more clarification on the benefits, respectively.

Figure 195. Participant Satisfaction with the Program



Source: Participant Survey: B9. "Thinking about your overall experience with the Program, would you say you are very satisfied, somewhat satisfied, not too satisfied, or not at all satisfied?" (n≥6)

Satisfaction with Program Actors

Participants potentially interacted with three types of Program actors throughout the process: Focus on Energy representatives (this included the Program Implementer and, on occasion, other representatives), Trade Allies (Retrocommissioning Service Providers and Technical Service Providers), and utility Key Account Managers. Of these three groups, virtually all participants (11 of 13) gave Trade Allies "very satisfied" ratings.

Half of the participants (seven of 13) reported they did not interact with their utility Key Account Manager; however, participants who did said they were "very satisfied" (five of six participants). When asked about satisfaction with Focus on Energy representatives, participants were divided between being "very satisfied" (four of 13) and "somewhat satisfied" (six of 13). Few Express Building Tune-Up participants had significant contact with Focus on Energy representatives (three of six).

Table 234 shows satisfaction ratings for all three types of Program actors for both core and Express Building Tune-Up participants.

Table 234. Satisfaction with Program Actors

Program Actor	Very Satisfied	Somewhat Satisfied	No Interaction
Core			
Focus on Energy Representatives	2	5	0
Retrocommissioning Service Provider	6	1	0
Utility Key Account Manager	3	1	3
Express Building Tune-Up			
Focus on Energy Representatives	2	1	3
Technical Service Provider	5	1	0
Utility Key Account Manager	2	0	4
Total	**20**	**9**	**10**

Source: Participant Survey: B1, B3, and B5. "Thinking about your satisfaction with Focus on Energy Representatives/Utility Key Account Manager/Service Provider, would you say you were very satisfied, somewhat satisfied, not too satisfied, or not at all satisfied?" (n≥6)

The Evaluation Team found that lack of a consistent contact was a key reason behind slightly lower satisfaction ratings among core participants for Focus on Energy representatives. Several core participants reported they had to deal with different representatives for different programs and wished they could deal with just one. Other issues were staff turnover and changes at CLEAResult and with its subcontractors. Three core participants described these issues as follows:

- "There was some confusion on who we were supposed to deal with. We had like five reps."
- "Somewhat satisfied due to turnover among staff."
- "Having different reps for different programs. For me, this is frustrating. Because she couldn't help me with retrocommissioning, she had to defer me to someone else."

Another area that caused slightly lower satisfaction with Focus on Energy representatives was change in eligibility and rebate amounts, as illustrated in these comments from two core participants:

- "The only reason why it's not 'very' is because the rebate changed mid Program. It went down. We entered into a special program for our gas that didn't qualify under the Retrocommissioning Program. We were unaware of that until we were a few steps into the Program."
- "Somewhat satisfied. Initially the gentleman I dealt with identified a lesser cost than what it turned out to be."

These comments illustrate some challenges that participants encountered in the Program. However, it is important to note that all but one core participant was "very satisfied" with the Program overall, and not one participant reported dissatisfaction with Focus on Energy representatives.

Satisfaction with Specific Program Components

To understand if there were challenges with specific components of the Program, the Evaluation Team asked participants about their experiences with the following::

- Application process
- Program requirements
- Focus on Energy website
- Incentive structure (not applicable to Express Building Tune-Up)
- Incentive payment wait time (not applicable to Express Building Tune-Up)

Overall, participants gave high satisfaction ratings across most Program components (see Figure 196 and Figure 197). They especially noted that the Trade Ally handled most of the paperwork, calculations, and incentive procedures. Three of 13 participants were "not too satisfied" with the clarity of Program requirements (two core participants and one Express Building Tune-Up participant) due to confusion about the Program requirements and issues with the workbook.

The Evaluation Team asked about satisfaction with the Focus on Energy website, but few participants could answer. Only four participants reported accessing the website during their participation in the Program (two core participants and two Express Building Tune-Up participants). These participants were "somewhat satisfied." One participant explained that the website had "a lot of info... [where] you have to do some searching to find what you want."

Figure 196. Participant Satisfaction With Core Components

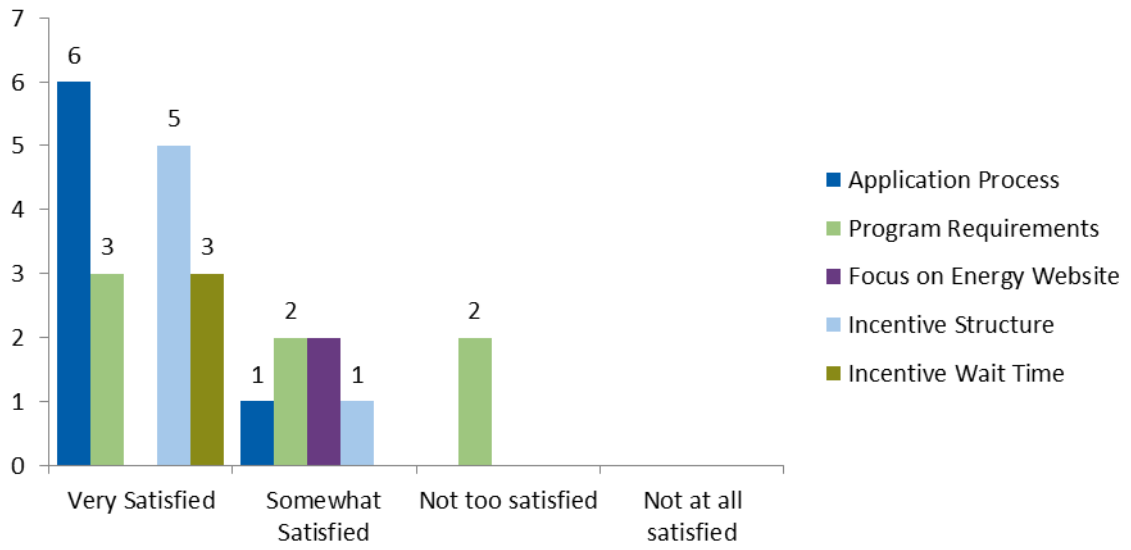
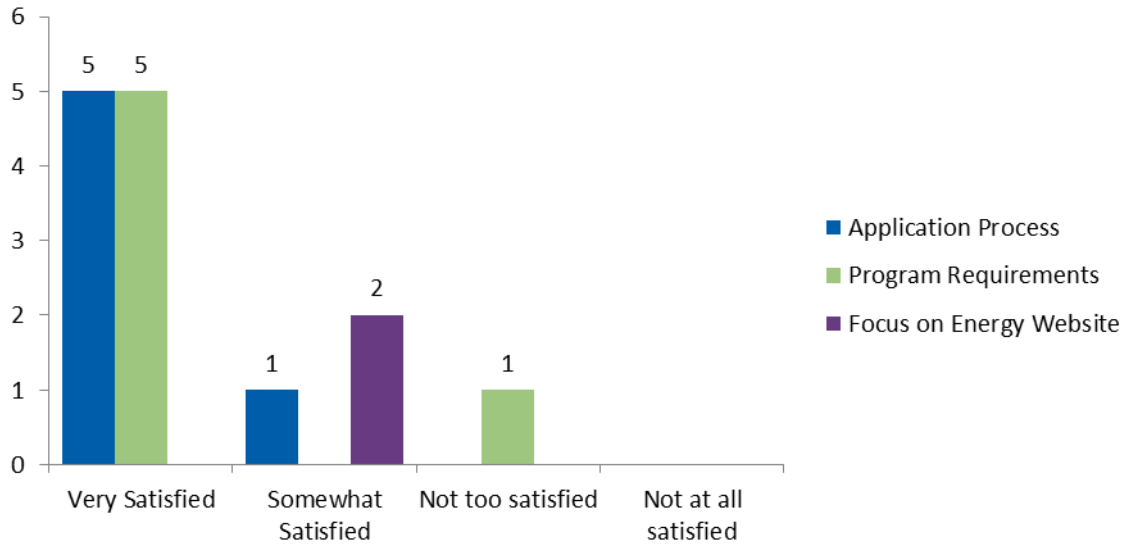


Figure 197. Participant Satisfaction With Express Building Tune-Up Path



Source: Participant Survey: B5a. "How would you describe your satisfaction with the application process/clarity of Program requirements/Focus on Energy website/incentive structure/incentive wait time?" (n≥6).
Note: Some participants' projects were still in progress at the time of the survey; therefore, ratings on incentive topics were not applicable.

Participant Decision-Making

Participants most frequently said they participated to save money on energy costs, to save energy, or to receive the Program incentive. Participants also said they participated due to problems with equipment, to improve tenant comfort, and the other reasons shown in Table 235.

Table 235. Reasons for Participating

Reason for Participation	Responses		Total
	Core Participants	Express Building Tune-Up Participants	
Saving money	4	2	**6**
Saving energy	3	1	**4**
Program incentive	2	1	**3**
Problems with building/equipment	0	2	**2**
Tenant comfort/satisfaction	0	2	**2**
Contractor's experience	0	1	**1**
Third-party verification	1	0	**1**
Free inspection and assessment	0	1	**1**
Program process and design	0	1	**1**

Source: Participant Survey: A2. "What were the most important factors that influenced your decision to participate?" (n≥6). This question allowed for multiple responses.

The Evaluation Team then asked participants a follow-up question to determine if there was anything specific about the information they received that really convinced them to move forward with projects. As shown in Table 236, participants relied on concrete information and data (for example, projected savings) as well as more anecdotal information (for example, previous knowledge or experience).

Table 236. Types of Information Facilitating Participation Decision-Making

Data-Based Influencers	Anecdotal Influencers
Core Participant Responses	
• The payback period • The energy assessment • Examples of other projects • Energy usage compared to others • Energy savings calculations	• Previous retrocommissioning knowledge • Sounded like a good idea • Energy advisor was engaging
Express Building Tune-Up Participant Responses	
• Availability of the discount • Cost-savings	• The information was convincing • In need of the service • Persistent follow-ups

Source: Participant Survey: A3. "Was there anything specific in the information that [INSERT ANSWER FROM A1] provided to you that helped you decide you wanted to conduct this project?" (n≥4). This question allowed for multiple responses.

Persistence

A key objective of the Retrocommissioning Program is to sustain the energy savings achieved through retrocommissioning after project completion. Because many retrocommissioning measures require changes to set points and controls, the risk that these settings are not maintained over time compromises the life-cycle savings of the project. The Program offers a persistence bonus incentive for participants whose original project savings are maintained for at least 90 days after project completion. The Evaluation Team assessed the customer's level of persistence according to five actionable indicators:

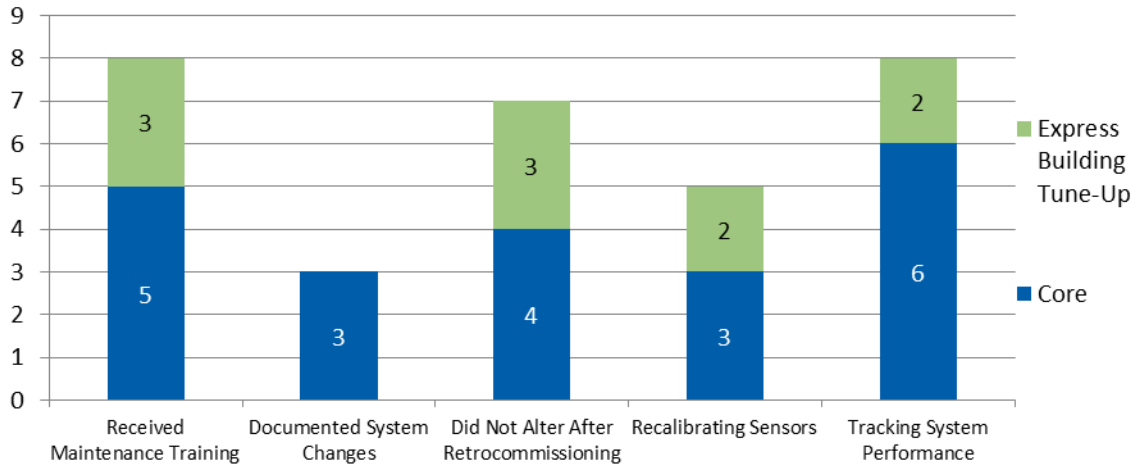
- Get maintenance training
- Document system changes
- Not alter the retrocommissioning measures
- Recalibrate sensors once or twice a year
- Track system performance

At the time of the Evaluation Team's survey, no projects were eligible because project completion dates were so recent. However, the Evaluation Team asked participants with completed projects about the five actionable indicators of persistence. Notably, five of 13 participants were not able to answer any of the indicator questions because their projects had been recently completed and this would not have allowed enough time to adequately assess persistence. Therefore, at most, eight participants provided responses.

Overall, responses suggested that persistence may be higher among core than Express Building Tune-Up participants (see Figure 198). A greater proportion of core participants answered the persistence questions and reported taking on the related persistence actions. The smaller indication of persistence among the Express Building Tune-Up participants may be explained by the lack of a bonus incentive for persistence; the core path offers a persistence bonus incentive.

Across participants in both paths, the most common persistence indicators were to receive maintenance training (eight of eight), track system performance (eight of eight), and to not alter the retrocommissioning measures (seven of eight). One participant said that the retrocommissioning measures had to be altered due to building occupant priority: "We did try some things that we felt compromised patient care and so we had to back off." Three participants reported tracking performance through energy bills but not through the use of monitoring tools. Only three participants (all core participants) reported documenting system changes.

Figure 198. Participant Persistence for Retrocommissioning Project



Source: Participant Survey: D1, D2, D3, D4, and D6. "Did you receive maintenance training/document system changes/make any changes to your building systems after retrocommissioning/plan to recalibrate sensors/track system performance?" (n≥5).

Challenges and Suggestions for Improvement

Core Path

The majority of core participants (five of seven) said they did not experience any challenges during their participation in the Program. Of the two who had challenges, one said the Retrocommissioning Service Provider gave them limited direction throughout the process. The other one reported being concerned that the Retrocommissioning Service Provider found the workbook difficult and that this, in turn, could affect the accuracy of the cost-savings and the final incentive amount.

Although few core participants suggested improvement, one thought the overall clarify of the Program could be improved and another suggested Focus on Energy improve project management to better handle tasks and timelines.

Express Building Tune-Up Path

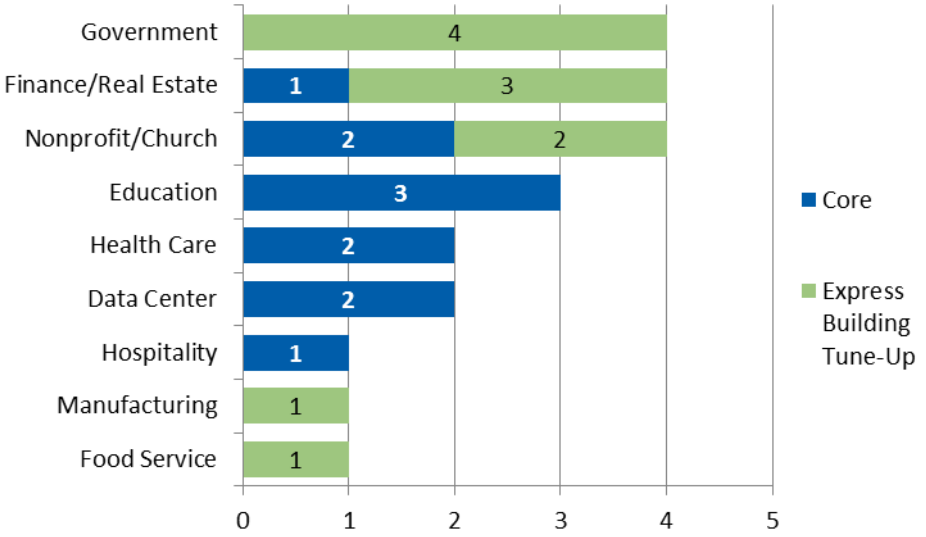
Express Building Tune-Up participants had diverse suggestions for Program improvements, as follows:

- "More communication of [the Program's] availability. It wasn't very clear to me when we first had our walk-through that this was a possibility."
- "The only thing I could think of is to send us a publication—for property managers specifically."
- "Put a sample report on the website to give people an idea of what you'll get out of it."
- "More focus on industrial customers."

Firmographics

The Evaluation Team collected information about the participant's organization. Figure 199 shows various types of organizations took part in the Program, with government, financial/real estate, and nonprofit/church organizations being the most frequent.

Figure 199. Participant Organization's Industry



Source: SPECTRUM database

Company Size and Ownership Status

Core participant organizations were substantially larger than Express Building Tune-Up participant organizations in number of employees, which is consistent with the Program's delivery strategy. As shown in Table 237, core path organizations averaged about 170 employees, and Express Building Tune-Up path organizations averaged about 60.

Table 237. Participant Organization's Employee Count

Participant Group	Number of Employees		
	Minimum	Maximum	Average
Core Participant Organizations	5	500	170
Express Building Tune-Up Participant Organizations	1	104	60

Source: Participant Survey: E4. "Approximately how many employees work at your current location?" (n≥6)

Almost all (12 of 13) participants said their facility was owner-occupied, but one participant did not know the ownership status of their building.

Heating Fuel

Table 238 shows most (eight of 12) organizations used gas for their heating fuel but that four also used a combination of gas and electricity.

Table 238. Participant Facility's Space Heating Fuel Source

Participant Group	Fuel Source		
	Gas	Electricity	Both
Core Participant Facilities	4	0	3
Express Building Tune-Up Participant Facilities	4	0	1

Source: Participant Survey: E2. "Is the space heated using electricity or gas?" (n≥5)

Trade Ally Experience

This section provides insights about the experience of the Retrocommissioning Service Providers and Technical Service Providers working with the Program.

Program Satisfaction

The Evaluation Team asked active Retrocommissioning Service Providers and Technical Service Providers to rate their overall satisfaction with the Program and their satisfaction with the Program Implementer.

Overall Program Satisfaction

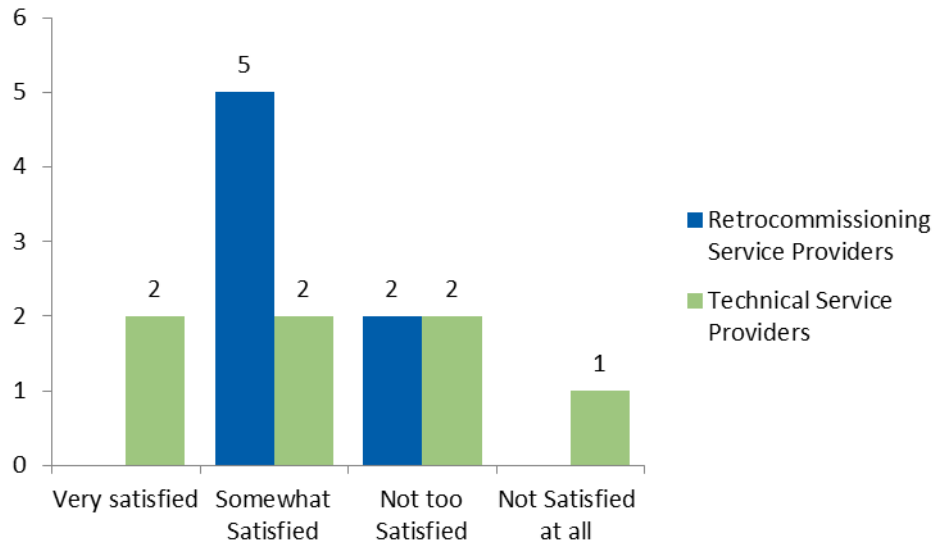
Most Retrocommissioning Service Providers rated their satisfaction with the Program as "somewhat satisfied" (five of seven).[81] The two respondents who reported that they were "not too satisfied" with the Program mentioned the following challenges:

- Burdensome Program paperwork
- Program design and incentive structure
- Labor intensive energy savings calculations and workbook approval
- Slow communication with Program staff

Satisfaction among Technical Service Providers was more diverse. Figure 200 compares the responses between the groups. Technical Service Providers who reported being "not too satisfied" or "not satisfied at all" reported that the process and paperwork were too time-consuming. One Technical Service Provider thought it was the Program Implementer's responsibility to fill out the workbooks and that this burden was now shifted to the contractors.

[81] The Evaluation Team only asked seven Retrocommissioning Service Providers about satisfaction since it interviewed seven active Retrocommissioning Service Providers and five non-active Retrocommissioning Service Providers.

Figure 200. Overall Satisfaction with the Program among Trade Allies



Source: Trade Ally Interview Guide: PS1. "Thinking about your overall experience with the Program, how satisfied are you overall? Would you say…" (n≥7)

The Evaluation Team found that Retrocommissioning Service Providers frequently reported difficulty with the energy savings workbooks, which is an issue that also impacted satisfaction with the Program Implementer. More detailed information on Retrocommissioning Service Provider feedback on the workbook is found in the Program Delivery section below.

One Retrocommissioning Service Provider who was "not too satisfied" did not like how the Program design had changed from the previous Focus on Energy retrocommissioning offering. Specifically, he did not agree with the new incentive structure, in which much of the work is front-loaded, with the participant receiving the incentive *after* the audit, implementation, and verification of measures. The respondent reported a shift from the previous program in which funding was made available for upfront investigation and was intended to provide more education to customers about energy-saving possibilities and encourage them to participate. With the new design, this respondent said, "People who aren't already thinking about [retrocommissioning] are not going to go after it."

Although the respondent noted later in the interview that the change in the Program to offer 50% of the incentive up front based on expected energy savings after the audit was completed was a "good step," he still did not think it was a solution to the "broader problem" of not offering the upfront incentive.

Satisfaction with the Program Implementer

All respondents gave a rating of either "very satisfied" or "somewhat satisfied" when asked about their experience working with the Program Implementer (13 of 15). One respondent who reported being "very satisfied," found the Implementer staff to be "very responsive." Two Technical Service Providers stated they did not feel they had enough interaction with the Program Implementer to provide a satisfaction rating.

Both Retrocommissioning Service Providers and Technical Service Providers who indicated they were "somewhat satisfied" (nine of 15) with the Implementer staff mainly expressed concerns and challenges with the review process for the energy savings workbook. However, some of this feedback was paired with an acknowledgement that these problems occurred early in Program rollout and that there had been some improvement on approval times. One Technical Service Provider noted, "[He] was new at it himself and was learning along with us, but was very helpful. It was obvious he was learning but he was doing the best he could." Another Technical Service Provider said it had taken over three weeks to get the workbook finalized for an Express Building Tune-Up project.

Program Participation and Awareness

Most of the active Retrocommissioning Service Providers reported learning about the opportunity to participate in the Program because they had participated in the previous Focus on Energy Retrocommissioning Program (five of seven). The non-active Retrocommissioning Service Providers first learned about the Program through Focus on Energy representatives or the Program Implementer (two of five), newsletters and e-mails (two of five), and through another company contact (one of five).

Active Retrocommissioning Service Providers also became aware of the Program through the following:

- Professional organization (one of seven)
- Newsletters and e-mails (one of seven)
- Focus on Energy Trade Ally network (one of seven)

Technical Service Providers learned about the Program most often through the Program Implementer (n=5). Of this group, one respondent was already an approved Retrocommissioning Service Provider for the core Retrocommissioning Program, and one respondent also reported already being a Focus on Energy Trade Ally. Two reported they were invited to attend a seminar on the Program, and one learned about the Program from a colleague.

Program Delivery

When asked about the overall clarity of Program requirements, the responses were split. Among Retrocommissioning Service Providers, six respondents said that the Program requirements were clear and that if they had any problems or questions, they knew who to contact for answers. Five Retrocommissioning Service Providers, however, thought the Program was confusing and burdensome, and that the Program Implementer was not prompt in communicating. These varied perceptions were from both active and non-active Retrocommissioning Service Providers. One non-active participant stated he did not have enough experience with the Program to give a response.

Similarly, four Technical Service Providers reported that Program requirements were clear, and four Technical Service Providers thought requirements were confusing. One contractor who thought requirements were clear said, "So far, the requirements have been reasonable. The workbooks have templates so they're reasonable." On the other hand, another Technical Service Provider reported: "There was confusion because during the initial training, they didn't get really specific because it was

brand new and they didn't have everything in place. We had to have some reps come in to clarify things for us. They weren't very prepared, initially."

Workbook and Savings Calculations—Core and Express Building Tune-Up Projects

Of the Retrocommissioning Service Providers who completed this phase, almost all (four of five) reported difficulties with the workbook. Respondents expressed frustration with both the labor required to complete the workbook calculations and the rigor with which the calculations were reviewed. Respondents reported that the amount of information needed to complete the calculations took a lot of time to gather and compute, which caused project delays and additional cost to the customer.

The Retrocommissioning Service Providers reported these difficulties with the workbook:

- The workbook requirements were more precise than needed for initial savings estimates because exact calculations are impossible until after implementation.
- The process caused challenges for some projects with tight timelines.
- The review entailed obtaining multiple sets of comments, one set from Program Implementer and one from the Program Administrator.
- Training Retrocommissioning Service Providers received on the Program requirements did not align with the actual process for completing the workbook or the workbook review. Thus some providers felt surprised and unprepared for the time it took and what was required from them.
- The process was labor-intensive and time-consuming.

The same was true for Technical Service Providers who had completed this stage (seven of eight). Five contractors said they had difficulties with the workbook. Three contractors were dissatisfied with the workbook process because they felt it affected the payment process: one said it took too long to approve payment and two said changes to the workbook caused the overall project cost to be lowered. These workbook problems explain the inconsistencies with the cost-savings projections and final incentive payment that customers reported.

Program Aspects Working Smoothly

The majority of Retrocommissioning Service Providers reported that stages of the Program, other than the workbook, were working well. They said the Enhanced Opportunity Assessment, proposal, Incentive Agreement, and verification all worked smoothly, although only two Retrocommissioning Service Providers had completed project verification at the time of the interviews.

In general, the interviews conveyed a strong sense that the service providers are advocates for the process and believe in the energy-savings potential of the Program activities. When asked about particular components of the Program that they thought worked well, Service Providers said:

- Generous customer incentives
- Customer satisfaction with results
- The outreach conducted by the Program

- The customer leads provided to the Retrocommissioning Service Providers
- The initial audit phase
- "The whole process has been painless."

Technical Service Providers responses included:

- The Program is direct, clear, and straightforward
- Good communication; timely communication from the Program Implementer when things change
- The payment process
- "The Program is a great idea."

Training

All Trade Ally respondents (20 of 20) reported having at least some experience with retrocommissioning before participating in the Program. Table 239 illustrates that the active Retrocommissioning Service Providers had the most experience with retrocommissioning before participating in the Program but non-active Retrocommissioning Service Providers only had some experience. Most Technical Service Providers reported significant experience, an unexpected result given that only one respondent was an approved provider.

Table 239. Retrocommissioning Experience Prior to Program Participation

Service Provider Network	Significant Experience	Some Experience	Little/No Experience
Active Retrocommissioning Service Providers	6	1	0
Non-Active Retrocommissioning Service Providers	0	5	0
Technical Service Providers	5	3	0

Source: Trade Ally Interview Guide: T0. "What was your level of experience with building commissioning or retrocommissioning before participating in the Focus on Energy Program? Would you say you had. . .?" (n≥5)

The majority of both Retrocommissioning Service Providers and Technical Service Providers said the training was either "very helpful" or "somewhat helpful" because it familiarized them with Program requirements and the intricacies of participation (see Table 240). Trade Allies generally reported that the training helped them understand the incentive structure and how it is different from other utility incentive programs. Two respondents reported that they did not attend the training.

Table 240. Helpfulness of Program Training

Service Provider Network	Very Helpful	Somewhat Helpful	Not Very Helpful	Not Helpful at All	No Training
Active Retrocommissioning Service Providers	1	4	1	0	1
Non-Active Retrocommissioning Service Providers	2	2	0	0	1
Technical Service Providers[1]	4	2	0	1	0
Total	**7**	**8**	**1**	**1**	**2**

[1] One Technical Service Provider said he did not know.

Source: Trade Ally Interview Guide: T1. "Thinking about the training that you received from CLEAResult for the Program, how helpful would you say that was? Would you say. . .?" (n≥5)

Areas of Additional Training

Trade Ally respondents reported that additional training would be beneficial on a variety of topics. Consistent with other comments on the workbooks and savings calculations, three Retrocommissioning Service Providers wanted more information on the Program Implementer's expectations for savings calculations. In this group, one respondent who had not yet completed a project found the training on the calculation phase and workbook process was vague. He reported, "It was presented like, 'do your calculations and we will review,' which leaves it very unknown and open ended for those who haven't done the Program yet. I would like to see more information or descriptions on the calculations."

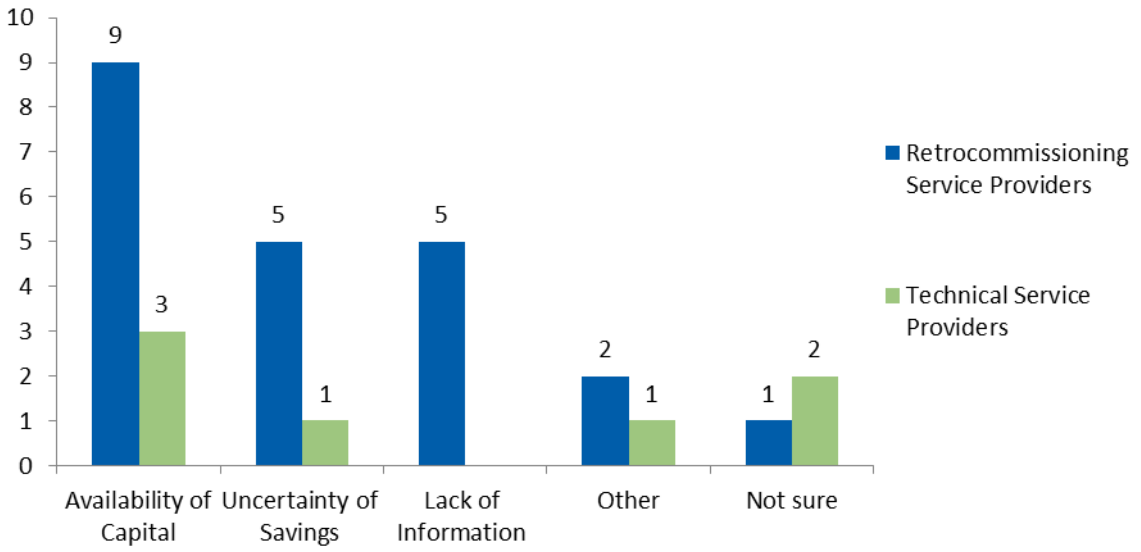
Two Technical Service Providers also said more training on the workbook would be beneficial.

One Retrocommissioning Service Provider reported specifically that he would appreciate more guidance on how to calculate interactive effects between measures, and another reported wanting more guidance on testing and implementation. Lastly, one Retrocommissioning Service Provider said he would like to understand exactly how Focus on Energy views the process of retrocommissioning so that any misunderstandings could be minimized.

Market Barriers

Interviewers asked all Trade Ally respondents about the main market barriers that stopped customers from pursuing retrocommissioning or building tune-ups. The top market barrier that Trade Allies reported was the availability of capital (see Figure 201). Other common responses included lack of information on retrocommissioning and the uncertainty of savings.

Figure 201. Market Barriers to Retrocommissioning and Building Tune-Ups



Source: Trade Ally Interview Guide: PE1. "In your experience, what are the main barriers to customers pursuing building retrocommissioning?" (n≥7). Note: Multiple responses allowed.

Of the two Retrocommissioning Service Providers who had an "other" response, one noted that most customers do not understand the payback potential of retrocommissioning and that sometimes the project contacts do not make the financial decisions, so the process can get off to a very slow start. The second respondent expressed two concerns: (1) customers could hear about and be affected by negative experiences with retrocommissioning, and (2) not all retrocommissioning providers are qualified. The one Technical Service Provider response characterized as "other" noted that finding a contractor to conduct the tune-up was a challenge.

Overcoming Market Barriers

Retrocommissioning Service Providers frequently suggested (six of 12) that publicizing the Program widely and providing clearer information to participants up front about its costs and benefits would overcome barriers to retrocommissioning and Program participation. Further, three respondents suggested staggering the incentive process so the owner receives an incentive for the planning or audit phase.

One respondent suggested a tiered incentive structure based on the amount and types of measures they agreed to install, noting this would allow Retrocommissioning Service Providers the flexibility to suggest building-specific strategies as well as to help owners understand the overall financial impact of the study and the measure implementation. Another respondent suggested providing the incentive directly to the Retrocommissioning Service Provider or its consultant.

Suggestions to Improve the Program

Respondents had the following suggestions for improving the Program:

- ***Streamline the workbook.*** Three Retrocommissioning Service Providers and three Technical Service Providers reiterated their desire to streamline the workbook stage and reduce the time and resources spent on reviewing calculations for accuracy.
- ***Restructure the incentive.*** Two Retrocommissioning Service Providers suggested reintroducing an investigation or planning stage that provided more funding up front in order to drive Program participation. One of these respondents acknowledged the free Enhanced Opportunity Assessment but suggested this approach needs to go deeper for larger facilities and more funds would be required.
- ***Involve more market actors.*** One Retrocommissioning Service Provider suggested that Focus on Energy consider ways to involve third-party consultants, such as building energy management firms or engineering firms, to handle these types of projects on behalf of building owners.

Key Program Processes

The Core path projects follow the seven main steps listed here:

Core Retrocommissioning Path Process

8. ***Enhanced Opportunity Assessment***. The customer completes a basic questionnaire to determine if the project is a good fit for the Program. Customers and Retrocommissioning Service Providers may choose an Enhanced Opportunity Assessment that involves a building walk-through, if needed. If the assessment is conducted by the Program Implementer, he or she will alert the entire Retrocommissioning Service Provider network about the project so it can assess which of its members has the availability and interest to pursue the project.

   The Program Implementer reported that Enhanced Opportunity Assessments are conducted by the participant recruiter, either the Implementer or the Retrocommissioning Service Providers. When asked what types of applicants are not a good fit for the core path, Program Implementer staff reported that they have turned away buildings that were too small for data trending to be cost-effective (before the introduction of the Express Building Tune-Up path) or if a customer was mainly interested in installing new equipment.

9. ***Proposal and Kick-Off Meeting***. If the customer is a good fit for the Program and is interested in proceeding, a Retrocommissioning Service Provider then prepares a proposal that specifies, among other things, the cost of a retrocommissioning audit for the facility. This proposal does not require approval from the Program Implementer. The Retrocommissioning Service Provider and Program Implementer then meet with all relevant facility personnel to present the proposal, project timeline, and details.
10. ***Audit and Workbook Submittal.*** After the kick-off meeting, the Retrocommissioning Service Provider conducts the audit; records all data trending, engineering calculations, and electric and gas savings in a workbook; and recommends energy-saving measures). The Retrocommissioning

Service Provider then submits the workbook to the Program Implementer for review and approval. After the review, the Implementer submits the workbook to the Program Administrator for final sign-off.

11. ***Incentive Agreement and Part 1 Payment.*** Once approved, the customer reviews the workbook and decides which measures to implement. The customer then signs an Incentive Agreement, which obligates the customer to implement measures, and receives 50% of the incentive based on projected savings. The agreement also stipulates that the customer must refund incentives if either (1) the measures are not implemented or (2) they misrepresent the installation.
12. ***Implementation.*** The customer implements the retrocommissioning measures, using in-house staff or contractors of its choice.
13. ***Verification and Part 2 Payment*.** The Retrocommissioning Service Provider verifies that the measure was installed and operating as intended to achieve the forecasted energy savings. Workbooks are refined as needed. The Program Implementer reconciles projected incentive amounts with actual savings and pays the customer the balance of the incentive. The project is considered complete after this step.
14. ***Persistence Measurement and Bonus Incentive.*** Ninety days after implementation, customers are eligible to receive a bonus incentive for persistence. The Retrocommissioning Service Provider visits the facility to check that all measures are being maintained at optimal efficiency. As the Program Implementer reported, this visit offers other less tangible benefits to help secure long-term energy savings persistence. These are reinforcing behavioral patterns and decision-making, providing additional education, and affirming that the retrocommissioning has positively impacted building systems.

Express Building Tune-Up Path Process

The Express Building Tune-Up path projects follow four main steps:

15. ***Enhanced Opportunity Assessment***. The customer completes a basic questionnaire to determine if the customer is a good fit for the program.
16. ***Building Walk Through.*** The Technical Service Provider performs a walk-through assessment to identify opportunities for building tune-ups, which focus generally on HVAC systems, mechanical controls, and lighting.
17. ***Implementation and Workbook Submittal.*** The Technical Service Provider works with the customer to implement adjustments, documents the measures in a workbook or workbooks, and submits the workbooks to the Program Implementer.
18. ***Payment and Verification.*** The first project of each Technical Service Provider must be verified. After that, the Program Implementer will verify 10% of the projects for each Technical Service Provider. Payment is submitted to the Technical Service Provider, not the customer.

Differences between the Core and Express Building Tune-Up Process

The major differences in the processes of these paths are:

- Express Building Tune-Up workbooks do not require approval before project implementation, because the Program Implementer uses deemed savings estimates for 30 different measures. The Implementer reported that contractors are required to obtain approval only in select cases, such as when implementing certain complex measures.
- A Technical Service Provider implements the measures, not the customer, for Express Building Tune-Up projects.
- Core path projects are verified before payment. Not all Express Building Tune-Up projects are verified before payment.
- Persistence is not currently measured for Express Building Tune-Up projects.

Benchmarking Against Other Retrocommissioning Programs

The Evaluation Team researched four other retrocommissioning programs in other parts of the country to gauge similarities and differences between program impacts, implementation strategies, and feedback from service providers. The research focused on programs with available evaluation results of early program years in order to tailor these results to Focus on Energy's experiences and investigate barriers and challenges with ramping up retrocommissioning programs.

The Evaluation Team reviewed publically available evaluation reports for multiple program years for three utilities: Commonwealth Edison (ComEd; Illinois), Rocky Mountain Power (Utah), and San Diego Gas & Electric (California). The research also included findings from one evaluation of a utility program in the Southwest that is not public.[82]

Program Design

The four programs all had a common feature: a free retrocommissioning engineering study with a customer commitment to install measures. Two programs offered the free service as the only incentive for participating in the program (without other cash incentives for implementing measures), and two offered the free study combined with implementation incentives. Table 241 shows the commonalities and differences among the four retrocommissioning programs.

[82] The Evaluation Team conducted the Southwest utility's non-public program evaluation. A full list of the publicly available references that informed this section is in Appendix S.

Table 241. Retrocommissioning Program Design Comparisons

Utility	Program Design	Spending Agreement	Other Details
Focus on Energy	Offers incentives for retrocommissioning measures with short payback periods. Performance-based for core. Prescriptive for Express Building Tune-Up.	• Core: No spending agreement. Customer signs an Incentive Agreement, promising to implement measures, and receives 50% of the incentive based on projected savings. • Customer pays a flat rate of $250 for a building walk-through and system adjustments.	• Core: Payments are delivered to the customer in three phases (audit, verification, and persistence) • Express Building Tune-Up: Payment is delivered to the trade ally
ComEd	Free retrocommissioning study with customer commitment	$10,000 or $20,000 for the implementation of measures that have a low payback period (depending on the size of the savings determined by the study)	Customer to refund the cost of the study if measures are not implemented within a mutually agreed upon timeline. No incentives are paid for implementation.
Rocky Mountain Power	Free retrocommissioning study with customer commitment	$10,000 for implementation of measures	Can receive an implementation incentive at the rate of $0.02 per kWh verified savings[1]
San Diego Gas & Electric	Free retrocommissioning study with customer commitment	Customer's financial commitment to implement subsequent measures is unclear	Incentives are available for implementation at $0.08 per kWh and $1.00 per therm for verified savings[2]
A Southwest utility	Free retrocommissioning study with customer commitment	$10,000 for the implementation of measures that have a low payback period (depending on the size of the savings determined by the study)	Customer to refund the cost of the study if measures are not implemented within a mutually agreed upon timeline. No incentives are paid for implementation.

[1]Program incentive information as specified on the Rocky Mountain Power website as of January 2014: https://www.rockymountainpower.net/bus/se/utah/em.html

[2]Program incentive information according to the San Diego Gas & Electric Retrocommissioning Program website as of January 2014: http://www.sandiegorcx.com/

Program Impacts

Compared to the other four programs, Focus on Energy's Retrocommissioning Program had a stronger start in terms of the number of completed projects within its first year. Across the four comparison programs, the data shows that although retrocommissioning programs were often slow to start in the

first one to two years, for the most part participation and savings (megawatt hours [MWh] and therms) increased over time (see Table 242). The table also lists the verified gross annual savings, participation, and net-to-gross ratio for Focus on Energy and the four comparison programs.

Table 242. Retrocommissioning Incentive Program Impacts Comparison

Utility/Administrator	Program Year	*Ex Post* Gross Electric Annual Savings (MWh/year)	*Ex Post* Gross Nat. Gas Annual Savings (Therms)	Completed Projects per Program Year	Net-to-Gross Ratio
Focus on Energy	1	2,867	285,695	24	0.986
San Diego Gas & Electric	1-2	9,888.8	265,863	4	1.0
	3-4	2,427.3	45,816	4	.8
	7	11,268[1]	124,766[1]	8	0.75
A Southwest utility	1	N/A[2]	N/A	1	N/A
	2	2,581	N/A	3	0.99
	3	4,445.1	N/A	7	1.0
	4	6,775.6	N/A	16	1.0
ComEd[3]	1	0	N/A	0	N/A
	2	7,174.1	N/A	14	0.91
Rocky Mountain Power[3]	1	0	N/A	0	N/A
	2	1,807.5	N/A	1	0.84
	3	7,098.3	N/A	16	

[1] Includes projects scheduled through the end of the program year.
[2] The program had one completed project in the first program year, but savings were not evaluated.
[3] The first program year did not claim any savings.

The strong project completion performance and the level of *ex post* savings from Focus on Energy's Retrocommissioning Program is likely related to its unique two-path option (core and Express Building Tune-Up). The Express Building Tune-Up offers quicker, yet smaller savings solutions that are more affordable than the core path, and almost half of the project completions came from the Express Building Tune-Up path. This comparative table will become more robust as more years are added for Focus on Energy's Program, so that more can be said about savings, participation, and net-to-gross ratios.

Feedback from Retrocommissioning Service Providers in Other Programs

In its review of evaluation reports, the Evaluation Team found that the feedback from service providers in three of the four comparison programs about program design and administration was similar to feedback from the Focus on Energy's Retrocommissioning Service Providers. Complaints about paperwork, calculations (workbook), and the time spent on the planning phase to develop projected energy savings were common themes. Detailed feedback information is provided in Appendix S.

Challenges with Launching Other Programs

Program administrators, implementers, and service providers from other programs described several challenges during the early years of their programs. These challenges included:

- ***Long project timelines.*** Long project timelines caused lags in claimed savings.
- ***Market readiness.*** Establishing clear and consistent processes and requirements with program staff and service providers takes time but can help to overcome some initial barriers.
- ***Strict eligibility requirements.*** Strict eligibility requirements on project size and building vintage inhibited participation for several programs.
- ***Program design.*** Slow starts were attributed to the original program design, which did not provide financial assistance upfront for investigation and/or implementation.

Detailed descriptions on the challenges are provided in Appendix S.

Customer Outreach and Retrocommissioning Service Provider Network for Other Programs

The strategies that other implementers used recruit customers varied, although the evaluation reports indicated that service providers were the main channel for promoting the program in three of the four programs (Rocky Mountain Power, San Diego Gas & Electric, and ComEd). The Southwest utility relied more heavily on utility account managers to recruit customers. Appendix S contains more information on outreach strategies used in other programs.

In its first year, San Diego Gas & Electric had a network of 12 service providers, five of whom were active. This network grew over time to 50 service providers in subsequent program years but still with only 10 who were actively participating. ComEd's network had nine service providers, six of whom completed projects in the first year of its program.

Compared to other first-year programs, Focus on Energy's network of 37 Retrocommissioning Service Providers—plus the Express Building Tune-Up Technical Service Provider network—is large. However, having only a small number of Retrocommissioning Service Providers actively participating in the Program is consistent with other utilities.

Program Cost-Effectiveness

Evaluators commonly use cost-effectiveness tests to compare the benefits and costs of a demand-side management program. The benefit/cost (B/C) test used in Wisconsin is a modified version of the total resource cost (TRC) test. Appendix I includes a description of the TRC test.

Table 243 lists the CY 2013 incentive costs for the Retrocommissioning Program.

Table 243. Retrocommissioning Program Incentive Costs

	CY 2013
Incentive Costs	$258,994

The Evaluation Team found the CY 2013 Program to be cost-effective (a TRC benefit/cost ratio above 1). Table 244 lists the evaluated costs and benefits.

Table 244. Retrocommissioning Program Costs and Benefits

Cost and Benefit Category	CY 2013
Administration Costs	$209,169
Delivery Costs	$854,126
Incremental Measure Costs	$576,024
Total Non-Incentive Costs	$1,639,319
Benefits	
Electric Benefits	$758,087
Gas Benefits	$1,268,550
Emissions Benefits	$561,316
Total TRC Benefits	$2,587,952
Net TRC Benefits	**$948,633**
TRC B/C Ratio	**1.58**

Evaluation Outcomes and Recommendations

The Retrocommissioning Program did not meet its original energy savings goals in CY 2013, but met its revised goals. Despite this, the Evaluation Team found the Program had stronger first year uptake than similar retrocommissioning programs and appears to be on a strong path. The Program Implementer and Program Administrator were flexible and acted quickly to address market barriers. In particular, the fast launch of the Express Building Tune-Up path midway through CY 2013, which was designed to reach smaller facilities, was successful in generating greater participation.

The Program Implementer and Program Administrator also made several key changes to the incentive structure in direct response to observed market barriers. In addition, customers were very satisfied with the Program and some indicated they plan to enroll additional sites.

There are several areas that Focus on Energy can consider improving in CY 2014 to help ensure it achieves its retrocommissioning goals.[83] The Evaluation Team identified the following outcomes and recommendations to help inform how retrocommissioning activities are carried out through the other nonresidential programs.

[83] Late in CY2013, the Program Administrator announced plans to stop operating Retrocommissioning as a separate program. Incentives for retrocommissioning services will be offered through the core business programs.

Outcome 1. The Program's initial strategy to rely on a large network of service providers to market the Program was unsuccessful.

- Of 37 trained and approved Retrocommissioning Service Providers, only 12 were actively engaged with a project in CY 2013. Further, only two core participants learned about the Program from their provider; most learned about it from a Focus on Energy representative.
- Research into other retrocommissioning programs found that even with a larger service provider network, the active service providers remain small in number.
- The Program Implementer and Program Administrator have already indicated that they want to pare down the service provider network in CY 2014 to cultivate active providers.

Recommendation 1. Consider paring down the service provider network to focus more attention on those willing to engage with Focus on Energy's programs.

- Reduce the network to about 25 service providers who are likely to be the most active. Research from other retrocommissioning programs showed that one-third to two-thirds of providers were active. One-third of providers were active in Focus on Energy's Program; from the current list of 37 Retrocommissioning Service Providers, two-thirds would be about 25 providers.
- Focus on providers with significant retrocommissioning experience. Active participants were likely to have significantly more experience compared to inactive providers.

Outcome 2: Trade Allies do not have adequate marketing tools and skills to inform and motivate customers to purchase retrocommissioning services.

- Trade Allies (Retrocommissioning Service Providers and Technical Service Providers) reported that customer's lack of awareness and knowledge of benefits of retrocommissioning is a market barrier.
- With the current marketing tools and activities, Trade Allies reported that they connected with only a small number of customers.
- Retrocommissioning Service Providers requested more help with marketing/sales skills and wanted more marketing materials, such as case studies, co-branding, and more information to help them explain the retrocommissioning process from start to finish.

Recommendation 2. Supply Trade Allies with both data-driven information and customer marketing skills and materials.

- Provide Trade Allies with data-driven (hard, fast facts) marketing materials and examples of savings achieved in Wisconsin projects. The Evaluation team found that customer decision-making involved quantitative influences such as energy savings or usage, payback periods, and project examples.
- Offer Trade Allies training in softer sales skills such as persuasion, small talk, and listening to deliver the data-driven marketing in a personable manner. Customers reported anecdotally that their decisions were also influenced if the Trade Ally was "engaging."

Outcome 3: Trade Allies experienced problems with the workbook, causing project delays and inaccuracies with savings projections and incentive payments.

- Research showed that other retrocommissioning programs also tended to have workbook-related problems.
- Trade Allies reported that the amount of information needed to complete the calculations took a lot of time to gather and compute, creating project delays and adding costs for customers.

Recommendation 3. Improve the workbook and workbook trainings.

- Address Trade Allies' concerns that the workbooks are confusing and complicated. Providing training opportunities, as well as one-on-one outreach, to communicate protocols, expectations, and methods, would help align expectations and encourage Trade Allies to promote Focus on Energy's retrocommissioning offerings more effectively. Further, when Trade Allies have more trust and understanding of the approach, they will be more likely to recommend retrocommissioning to their customers.
- Streamline workbooks. Other retrocommissioning programs have implemented streamlined workbooks, online workbooks, and training opportunities. However, there was a tradeoff between simplification and accuracy for these programs—the more simplified the workbook, the less accurate the savings.
- Educate the Trade Allies on how project documentation is used in the Focus on Energy programs and evaluation process. Knowing that the documentation is needed for other uses to improve Focus on Energy's retrocommissioning offerings may help Trade Allies see that documentation as less cumbersome.
- Review and refine the Express Building Tune-Up workbooks to improve how data are collected, findings and savings calculations are documented, and inputs are adjusted for each site.

Outcome 4. The current Program design, including not having a direct incentive, as other programs do, for up-front studies, seems to be working.

Research from other retrocommissioning programs showed that the Program did comparatively well in both savings and participation compared to four other retrocommissioning programs. Also, customers reported being very satisfied with the incentive structure; none said they would have liked Focus on Energy to pay for the initial investigation.

Recommendation 4. Maintain the current retrocommissioning offering design to give the market a chance to respond.

Do not make any large-scale changes to the current design of Focus on Energy's retrocommissioning offerings. These types of programs are often slow to ramp up, so allow some time for word to spread and for Trade Allies and customers to gain a deeper understanding of Focus on Energy's programs. In addition, provide additional marketing support. These steps will help drive demand and awareness of retrocommissioning in the marketplace.

Outcome 5. More engagement is needed to reach savings goals, particularly for core projects.

- The Program Implementer and the Program Administrator agreed the Program needed to do more to engage Trade Allies, other Focus on Energy implementers, and utility Key Account Managers in outreach activities that would boost participation.
- Core participants reported that they did not interact with their utility Key Account Manager. Few Express Building Tune-Up participants had significant contact with Focus on Energy representatives.

Recommendation 5. Consider ways to boost participation by identifying good retrocommissioning candidates, working more effectively with utility Key Account Managers, and leveraging other market actors. For example:

- Work with utility Key Account Managers to pilot a screening tool to identify buildings with the highest energy use in various market segments. After confirming that these high energy-users meet eligibility requirements, develop a more sophisticated analytic tool to help Retrocommissioning Service Providers and others obtain critical energy data about these buildings. These data should identify systems that are not functioning correctly so the Program Implementers, Key Account Managers, and Trade Allies can explain specific savings opportunities to the customer.

The Evaluation Team is familiar with several examples of building energy analytical tools used by other utilities or entities interested in improving efficiency. These include those developed by Retroficiency, FirstFuel, and FirstView™.

- Build a stronger relationship with the customer by assigning one Key Account Manager as the point of contact. With a more consistent relationship, the Key Account Manager will become more familiar with the customer and the project.
- Involve property or facility management firms or third-party controls contractors to increase Program recruitment and address leased space. In many commercial office buildings, operations and maintenance are managed by a third-party firm, which have a vested interest in providing value to their clients (the building owners) and helping them identify ways to save money on energy and building maintenance costs.

Outcome 6. The structure of the core retrocommissioning path involves multiple site visits, which may be more than needed and which may bother some customers.

- The core retrocommissioning path involves several steps that require site visits, such as the preliminary investigation, verification after implementation, and a persistence check. During the Impact Evaluation site visits, facilities staff at the participating sites said the number of visits to check work was excessive, particularly when there were additional requests for evaluation surveys and visits for evaluation activities.

Recommendation 6. Consider ways to manage facility staff's expectations about process checks and incorporate ongoing monitoring systems into the deliverables to minimize the required site visits.

- Work with the Retrocommissioning Service Provider to set up a persistence check protocol that can be easily deployed.
- Clearly communicate verification and persistence phases as retrocommissioning projects enter the implementation stage.
- Show facility staff how to use the same data points that Focus on Energy uses for the verification and persistence phase to confirm implemented measures are still functioning at a specific site. The Retrocommissioning Service Provider can demonstrate a specific persistence check process and train facility staff so they can monitor continued performance over time. The Evaluation Team can also use the same persistence process during the impact evaluation. The current core retrocommissioning path workbook does include a persistence plan; however, the Evaluation Team found these to be basic and not detailed. The Evaluation Team recommends that a more detailed persistence plan be included in the project deliverables.
- Consider including remote monitoring capabilities into the retrocommissioning process. This could be a combination of metering solutions with remote monitoring capabilities or a monitoring based commissioning platform. Another option would be to expand the program to include a full monitoring-based commissioning path.

Design Assistance Program

The Design Assistance Program launched on January 1, 2013, offering technical advice, energy modeling services, and financial incentives to owners and builders of new buildings more than 5,000 square feet.[84] Program participants receive incentives based on their buildings' energy savings (as projected by the Program's energy models). The Program Implementer, the Weidt Group, conducts outreach targeting design professionals, such as architects, engineers, and design/build contractors, to recruit projects for the Program. The Program offers design professionals financial incentives to participate.

Table 245 lists a summary of the Program' actual spending, savings, participation, and cost-effectiveness.

Table 245. Design Assistance Program Performance Summary

Item	Units	CY 2013 Actual Amount
Incentive Spending	$	$ 102,167
Verified Gross Life-Cycle Savings	kWh	21,310,000
	kW	120
	therms	228,100
Net Annual Savings	kWh	524,215
	kW	65
	therms	9,082
Participation	Facilities	2
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	1.13

[1] The Design Assistance Program launched on January 1, 2013.

Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted impact and process evaluations for CY 2013. The key questions that directed the Evaluation Team's design of the EM&V approach were:

- What are the verified gross and net electric and gas savings?
- How effective and efficient are the Program's operations?
- How can the Program's delivery processes cost-effectively increase its energy and demand savings?
- How effective are the Program's marketing, outreach, and communication efforts in reaching targeted participants, design professionals, and other influencers?

[84] Although the future building must be served by a participating Wisconsin electric or natural gas utility, Design Assistance participants may not be utility customers, so this report will refer to them as "participants."

- What are the barriers to increased participation, and how effectively is the Program overcoming these barriers?
- How satisfied are participants and design teams with the Program?
- Is the Program meeting cost-effectiveness requirements?
- How can Focus on Energy improve Program performance?

The Evaluation Team designed its EM&V approach to integrate multiple perspectives in assessing Program performance. Table 246 lists the specific data collection activities and samples sizes used to evaluate the Program.

Table 246. Design Assistance Program Data Collection Activities and Sample Sizes

Activity	CY 2013 Sample Size (n)	CY 2011-2013 Sample Size (n)
Impact		
Desk Review of Completed Projects	Census (2)	Census
Process		
Full Participant Interviews	Census (2)	9
Partial Participant Interviews	10	10
Participant Design Team Interviews	14	15
Program Administrator and Implementer Interviews[1]	6	11

[1] Interviewees included the Program Administrator's Program Manager and the Program Implementer's Program Manager, as well as supporting staff.

Data Collection Activities

The following sections provide details on the methodology for each of these data collection activities.

Impact Evaluation

Two Design Assistance projects completed construction relatively late in CY 2013. Given the timing, the Evaluation conducted a desk review of the building simulation models, project files, energy-savings estimates, and Building Energy Performance Summary output reports.

The two completed projects employed a variety of architectural, electrical, plumbing, and mechanical strategies to obtain energy savings over code baseline requirements. The following list outlines the impact of some of these measures:

- **Architectural.** These strategies improved the efficiency of each building's envelope and resulted in less than 5% of the total savings.
- **Electrical.** The electrical strategies involved reductions in lighting power density as well as lighting controls measures such as occupancy sensors, dual-level fixtures, and daylighting controls. In particular, the lighting power density reductions and occupancy sensors reported a large portion of the savings for both projects.

- **Mechanical.** These measures involved high-efficiency HVAC equipment, HVAC controls, high-efficiency water heating equipment, and other mechanical controls. The mechanical strategies varied significantly between the two projects, as shown in Table 247.
- **Plumbing.** The multifamily project installed energy-efficient showerheads, which reported 2% of total cost savings.

Table 247. Mechanical Strategies and Relative Savings by Project

Measure	Portion of Total Cost Savings
Multifamily	
Mini-split cooling efficiency, 60% increased seasonal energy efficiency rating (SEER)	7%
ACCU cooling efficiency, 30% increased SEER	5%
In-floor radiant heating	6%
Total heat recovery in each apartment	10%
Programmable thermostats in apartments	13%
School	
Ground coupled heat pump	34%
Proposed fan system design	19%
VFD on building and ground loop	10%
Central water-to-water heat pump pool heaters	8%

Process Evaluation

Administrator and Implementer Interviews

The Evaluation Team interviewed six key Program managers and contributors among the Administrator's and Implementer's staffs.

Participant Surveys

The Evaluation team interviewed both participants who completed projects in CY 2013 ("full participants"). The Evaluation Team also interviewed 10 partial participants, who had projects in progress, to provide wider feedback on the Program's first year of operation. Hospitals and K-12 schools were the most common building types among the participants interviewed, as shown in Table 248.

Table 248. Participant Building Types

Building Type	Full Participants	Partial Participants
Hospital		3
K-12 school	1	2
Commercial office		2
Assisted living		1
College/university		1
Local government		1
Multifamily	1	0

Source: Q4. "What is the primary intended use for this building??" (n=12; 2 full participants and 10 partial participants)

Design Team Interviews

The Evaluation team interviewed 14 design professionals who worked on Program projects. Eleven of these interviewees were architects, two were engineers, and one was a sustainability consultant. Design team members had to serve as the project manager for at least one active project in CY 2013 to qualify for an interview.

Impact Evaluation

To calculate gross savings, the Evaluation Team reviewed the CY 2013 data contained in SPECTRUM (the Program database) and then combined these data with data from the project files. To calculate net savings, the Evaluation Team used participant survey data.

Evaluation of Gross Savings

Tracking Database Review

The Evaluation Team reviewed data contained in SPECTRUM for completeness and quality. The data were thorough and complete; SPECTRUM contained all of the data fields necessary to evaluate the Program. The Evaluation Team also reviewed project files supplied by the Program Implementer, which included the Building Energy Performance Summary reports, application files, and simulation modeling assumptions.

The Evaluation Team applied an EUL of 20 years. The Program Administrator included the 20-year EUL in Program planning and used it in SPECTRUM. The Evaluation Team performed an engineering review and benchmarking and deemed that 20 years was an appropriate value for the EUL. For future Program evaluations, the Evaluation Team will examine the weighted average of EUL values for various measures such as lighting, mechanical systems, and building envelope.

Gross and Verified Gross Savings Analysis

In general, the Evaluation Team recalculated new construction energy savings by calibrating the as-built simulation model to post-occupancy billing data. The Program participants occupied the new

construction projects relatively late in CY 2013, reducing the available post-occupancy billing data. Therefore, the Evaluation Team determined it was not feasible to conduct on-site measure verification and utility billing calibration for these two projects. In addition to Program data, the Evaluation Team reviewed the Project Implementer's project files to verify the project-level savings.

Engineering Review

The Evaluation Team conducted a desk review for each project, which assessed the viability of installed measures, benchmarked energy use intensities against standard references,[85] and compared modeling practices against approaches recommended by ASHRAE Standard 90.1-2007.[86] The Evaluation Team's review found the simulation models often, but not always, met the recommended approaches from ASHRAE Standard 90.1-2007 and fell within the expected range of energy use intensities.

For one multifamily building project, the baseline energy use intensity for natural gas fell well below the U.S. Department of Housing and Urban Development benchmark, which resulted in a more conservative savings estimate. In addition, the Evaluation Team noted several areas in which the simulation model developers could adopt different approaches to better meet the requirements of ASHRAE Standard 90.1-2007. As the desk review findings provide highly specific details and recommendations that could potentially compromise participant anonymity, the Evaluation Team will provide these findings and recommendations in separate memos to the Program Administrator and Public Service Commission.

The Evaluation Team also reviewed a model a participant created for an active project to be completed in 2014, and found three areas of concern:

- Baseline building assumptions did not match ASHRAE Standard 90.1-2007 modeling guidance.
- The participant model included different equipment than in the project's design documents.
- The participant used different operating hours in the model than listed in the project's design documents.

Based on this analysis, the Evaluation Team concluded that the model likely overestimated the proposed building's energy savings. The Evaluation Team plan to evaluate the final performance in more detail during the CY14 impact evaluation.

Realization Rates

Overall, the Evaluation Team assumed the CY13 Design Assistance Program would have achieved an evaluated realization rate of 100% through a calibrated simulation analysis.

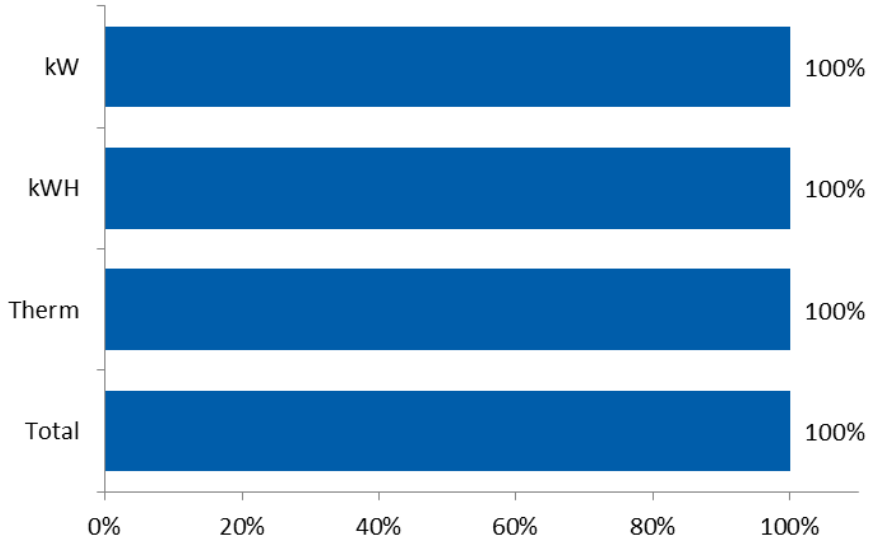
Figure 202 shows the realization rate by fuel type.

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[85] Commercial Building Energy Consumption Survey and Housing and Urban Development Benchmarked Energy Use Intensities for Multifamily Buildings.

[86] American Society of Heating, Refrigerating and Air-Conditioning Engineers.

Figure 202. Design Assistance Program Realization Rate by Fuel Type



Summary of Gross and Verified Gross Savings

Table 249 lists the total and verified gross savings, by measure type, achieved by the Program in CY 2013.

Table 249. Design Assistance Gross Savings Summary

Project Type	Gross			Verified Gross		
	kWh	kW	Therms	kWh	kW	Therms
Current Annual	1,065,500	120	11,405	1,065,500	120	11,405
Current Life-Cycle	21,310,000	120	228,100	21,310,000	120	228,100

Evaluation of Net Savings

Net-to-Gross Analysis

This section provides findings and commentary specific to the Business Incentive Program. For a detailed description of net-to-gross analysis methodology, please refer to Appendix L.

Freeridership Findings

The Evaluation Team used the self-report approach to determine the Program's freeridership level. The Evaluation Team determined a freeridership value for the two participants who completed building construction in CY 2013. For 10 active projects in which participants had completed energy modeling and savings calculations, the Evaluation Team determined an interim measure of freeridership.

The Evaluation Team considered both the modeling assistance and incentives the Program offers when assessing the Program's net savings.

The Design Assistance Program is different from other prescriptive rebate programs because it engages participants long before they decide to purchase and install equipment. A Program objective is to influence the design decisions and, ultimately, encourage participants to build a more energy-efficient building than they originally planned.

The design and build/major retrofit process for commercial buildings commonly takes longer than a year. Because of long lead times, only two participants completed building construction in CY 2013. However, the Program Implementer preapproved 72 projects during the year.

The Evaluation Team determined freeridership rates of 25% and 63% for the two completed projects. the Evaluation Team estimated that the Business Incentive Program had overall average freeridership of 44% in CY 2013. These rates are consistent with similar programs around the country, as shown in Table 250.

Table 250. New Construction Program Net-to-Gross Benchmarking

Program	Year	Net-to-Gross
Focus on Energy Design Assistance Program	**2013**	**56%**
ComEd C&I New Construction Program	2009	59%
ComEd C&I New Construction Program	2010	65%
ComEd C&I New Construction Program	2011	57%
East North Central Program	2011	95%
Nicor Gas Business New Construction Service	2011	33%
Ontario Power Nonresidential New Construction Programs	2008-2010	49%

As previously mentioned, the Evaluation Team also conducted the survey with 10 participants who had projects in progress. Although these data are not applicable to the CY 2013 freeridership calculations, they provide additional context for Program's overall freeridership rate. Preliminary analysis of the participants' responses indicates that none of the 10 respondents would have conducted energy modeling during the design phase. All of the respondents conducted the modeling with the assistance of the Program. All of the respondents reported that at least one of the following factors was highly influential in their decision to design and build a more energy-efficient building: the energy modeling, financial assistance for the modeling, or financial assistance for the recommended measures. Based on this feedback, the Program is working as designed.

None of the respondents reported they were highly likely to include energy-efficiency features and equipment in the building without financial assistance from the Program. Most respondents said they were building a more efficient building because the incentives enabled them to complete a different, more energy-efficient project than they could have otherwise.

Preliminary results indicate a freeridership score of 37% for the 10 projects in progress, which is lower than the CY 2013 average freeridership score of 44%. The freeridership scores for individual projects

ranged from 13% to 50%, which are also lower than the CY 2013 range of 25% to 63%. These findings suggest that a CY 2013 sample of two complete projects is insufficient to draw conclusions regarding freeridership.

Additionally, the results highlight the difficulty of identifying and influencing change in new construction projects with less than a 12-month timeframe. Namely, new construction projects that were far enough along to reach completion within 12 months of the Program's launch (January 1, 2013) were likely to be too far along for participants to incorporate major design changes. Therefore, energy-saving strategies in these early Program projects was less likely due to the Program's influence than participants who enrolled in the Program in earlier stages of design.

Spillover Findings

The Evaluation Team did not estimate spillover in CY 2013 because the spillover benefits take time to appear. The Evaluation Team will seek to identify Program spillover in CY 2014.

Net-to-Gross Ratio

The Evaluation Team calculated an overall Design Assistance Program net-to-gross estimate of 56%, as Table 251 shows.

Table 251. Design Assistance Program Freeridership, Spillover, and Net-to-Gross Estimates[1]

Measure Type	Freeridership	Spillover	Net-to-Gross
Overall	**44%**	**0%**	**56%**

[1] Weighted by distribution of evaluated gross MMBtu energy savings for the Program population.

Net Savings Results

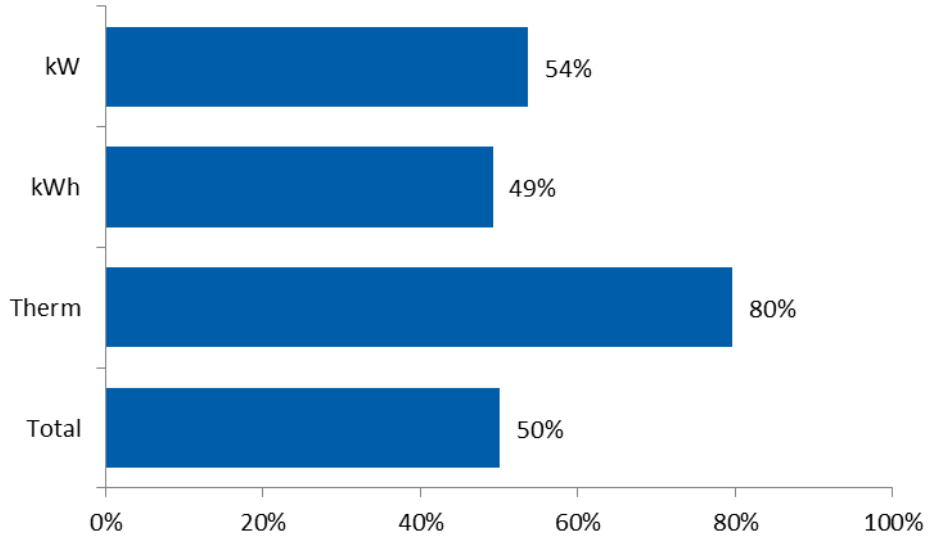
Table 252 shows the net energy impacts (kWh, kW, and therms) for the Program. The Evaluation Team attributed these net savings to reflect an estimate of what would have occurred in the absence of the Program.

Table 252. Design Assistance Program Net Savings

Project Type	Verified Net		
	kWh	kW	Therms
Annual	524,216	65	9,082
Life-Cycle	10,484,310	65	181,643

Figure 203 shows the net savings as a percentage of the *ex ante* gross savings by fuel type.

Figure 203. Design Assistance Program Net Savings as a Percentage of *Ex Ante* Savings by Fuel Type



Process Evaluation

Introduction

The Evaluation Team tailored its evaluation activities to provide robust feedback on the Program's first calendar year of operation. New construction projects often take a year or longer to reach completion. Although the Program's initial CY 2013 plan projected that it would not realize energy savings until CY 2014, the Program Administrator and Program Implementer later determined that one to three projects would be completed in CY 2013. Given the small pool of two full participants, the Evaluation Team interviewed 10 partial participants to provide greater real-time feedback on the Program's processes and spoke to eleven design professionals to obtain a broadly comprehensive understanding of the design team experience.[87]

In addition to the two projects completed verified in 2013, 31 active projects were in the Program pipeline as of early January 2014.

Program Design, History, and Goals

The Program's overall goal is to encourage owners and builders to avoid energy waste and the need for expensive retrofits by constructing new buildings that are more efficient than the building code requires. The Program Implementer developed the Program based on a new construction program model that it successfully employed in other states. The Program offers three main incentives:

- Free energy modeling services and efficiency-boosting design advice
- Financial incentives to the builder/owner based on energy savings

[87] Partial participants began a project in CY 2013 and had not completed it by the end of the year.

- Design team payment to address concerns over added costs from non-design time spent on program participation

Building owners with facilities larger than 5,000 square feet are eligible to participate in the Program. For buildings larger than 150,000 square feet, the Program Implementer or the project team completes an energy model using traditional energy modeling software. For smaller buildings, building owners can receive recommendations and savings calculations through the Program's Net Energy Optimizer (NEO^{SM}) online tool. NEO reduces the cost of modeling by working from a generic building model to provide modeling-based design assistance appropriate to the owner's building type.

Program participants can choose to pursue the energy modeling (traditional and NEO) in one of two ways. First, the Program Implementer's energy modelers can create the model; most participating building owners choose this option. Second, the building owner's design team can create a model and submit it for the Program Administrator and Program Implementer to review. The project team receives reimbursement for energy modeling costs if they choose to create the model. Of the 21 projects in the SPECTRUM database as of December 23, 2013, only one project team had chosen to create its own model; the others used the Program Implementer's modeling services.

Program Barriers

Full and partial participants identified four types of barriers they face when designing and building energy-efficient buildings. As shown in Table 253, participants face project management barriers, decision-making challenges, financial constraints, and technical knowledge gaps. Each of these barriers can potentially derail a project team's energy efficiency efforts. In some cases, the Program may be able to mitigate these barriers' adverse impacts.

The Program's design at least partially addresses the decision-making and financial barriers by:

- Providing an energy model to help owners/builders weigh up-front costs against long-term savings
- Offering financial incentives to offset the impact of energy-efficient design on project budget

However, it does not explicitly address the other two barriers (project management difficulties and technical knowledge gaps).

Table 253. Barriers Participants Face When Designing and Constructing Energy-efficient Buildings

Barrier Type	Specific Barrier(s)
Project management	• Difficulties with government regulation and coordination, or lack thereof (4 respondents) • The time required to incorporate energy-efficient designs (3 respondents)
Decision-making	• Weighing upfront cost against long-term savings (5 respondents)
Financial priorities	• Impact of energy-efficient design on project budget (5 respondents)
Technical knowledge	• Difficulty finding design professionals with sufficient technical knowledge (2 respondents) • Unfamiliarity with new technology (1 respondent)

Source: Q32. "In general, what challenges or obstacles, if any, do building owners like you face when designing or building efficient buildings?"(n=12; multiple responses allowed)

Design Assistance Program Management and Delivery

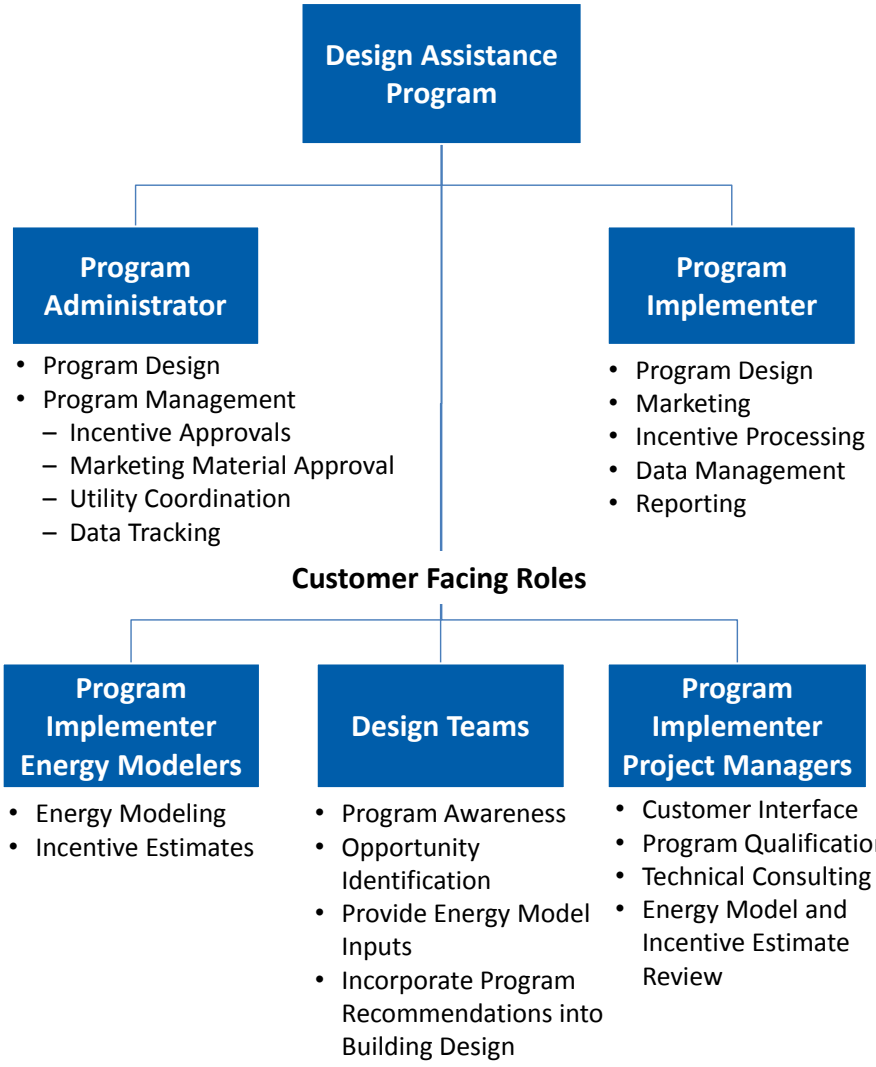
The Evaluation Team assessed various aspects of Program management and delivery, as described below.

Management and Delivery Structure

The Design Assistance Program shares a Program Administrator with Focus on Energy's core nonresidential programs. The Program Implementer does not implement any other Focus on Energy programs, but implements similar programs in other geographic areas. Figure 204 is a diagram that defines the role for each of the Program's five main actors.

The Program works with participants directly, via the Implementer's Project Managers, and also indirectly through the projects' design teams. The Design Assistance Program is the only nonresidential program that works closely with building design teams.

Figure 204. Design Assistance Program Actor Diagram



Program Data Management and Reporting

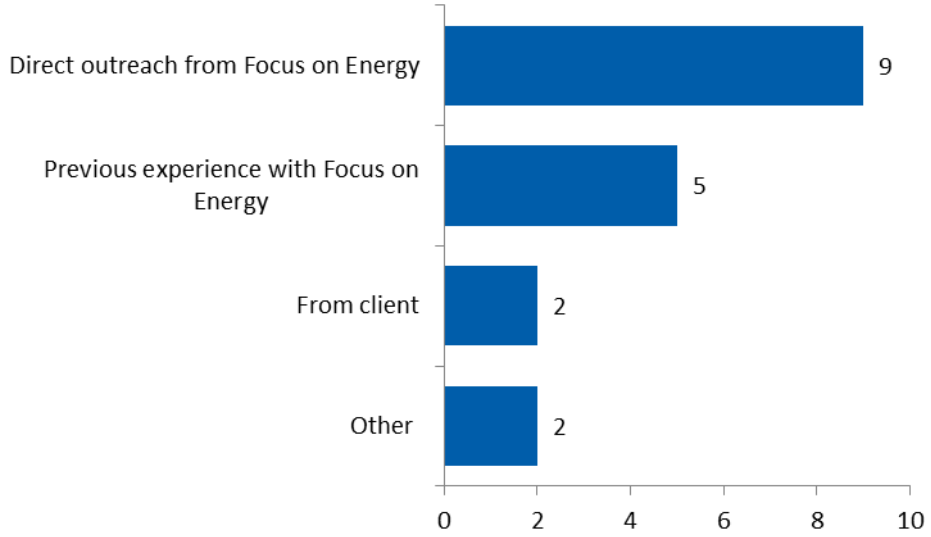
The Program Implementer managed projects using a proprietary collaboration tool called WeidtSpace[SM]. Once project teams made their design selections and signed an incentive agreement, the Program Implementer entered the project information in SPECTRUM for the Program Administrator to review and approve. Although the Program Implementer reported trying to find a way for SPECTRUM to import project data from WeidtSpace, the effort was unsuccessful. Therefore, the Program Implementer continued to manually enter data into SPECTRUM.

Design Assistance Program Marketing and Outreach

The Program's primary outreach channel is to recruit design professionals to learn about the Program and encourage their clients to participate. In CY 2013, the Program Implementer leveraged its network of existing contacts to generate awareness among design teams. As Figure 205 shows, design teams

most often said they learned about the Program through direct outreach from or previous experience with Focus on Energy.

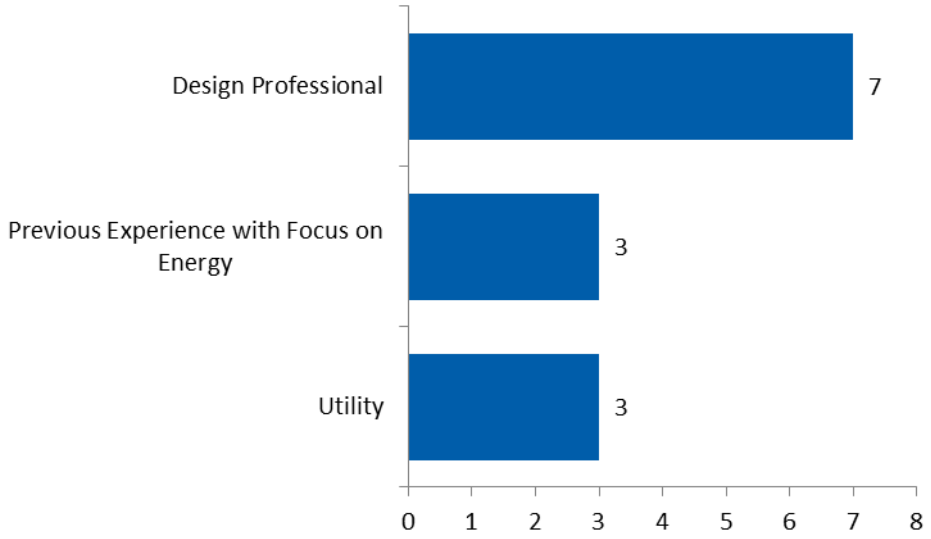
Figure 205. How Design Team Members Heard About the Program



Source: Q5. "How did you learn about the Design Assistance Program?"
(n=14; multiple responses allowed)

Consistent with the Program's strategy, participants said they most commonly found out about the Program through design professionals, with fewer finding out from their utility or from previous Focus on Energy experience (see Figure 206).

Figure 206. How Participants Heard About the Design Assistance Program



Source: Q5. "How did you learn about the Design Assistance Program?"
(n=12; multiple responses allowed)

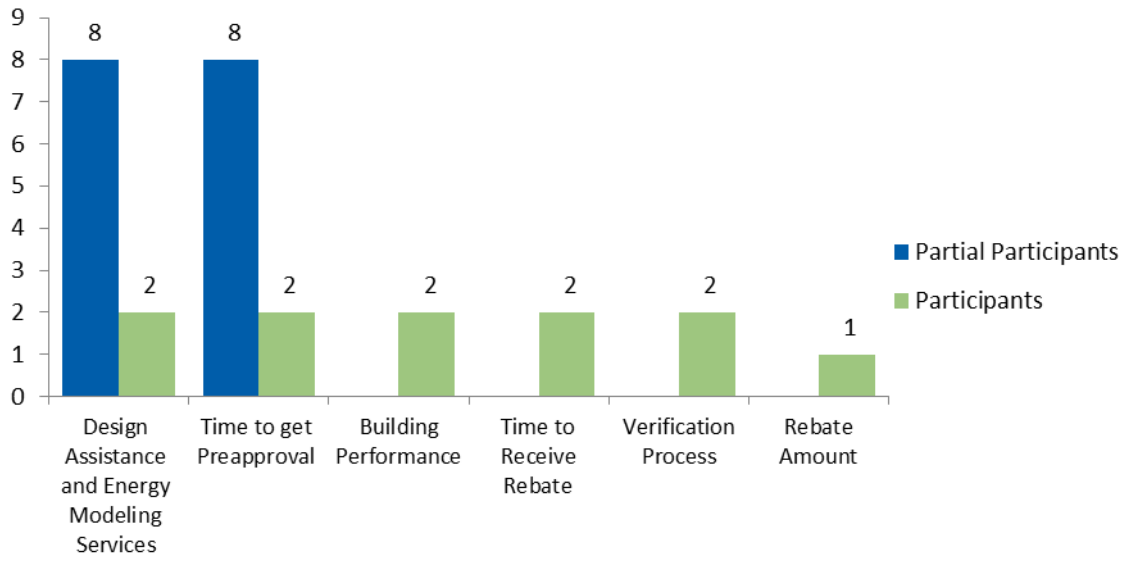
Program Satisfaction

The Evaluation Team asked participants and design teams about their satisfaction with the Program.

Participant Satisfaction

Responding participants gave the Program high satisfaction ratings for CY 2013. The two participants who completed Program projects in CY 2013 said they were "very satisfied" with every aspect of the Program except for the rebate amount. Eight of the 10 partial participants said they were "very satisfied" with the Program elements they had experienced: preapproval time and technical/modeling services. Figure 207 shows the number of participants who were "very satisfied" with various elements of the Program.

Figure 207. "Very Satisfied" Ratings for Various Program Aspects



Source: Q23-28. "How satisfied are you with…?"
(Participants n=2; Partial participants n=10)

Ten of the 12 participants (83%) said their buildings were more efficient because of their participation in the Program; two said their building would have been just as efficient without the Program. When asked about the Program's most important benefit, respondents said the Program helped them with decision-making, project management, project finances, support for client missions, and environmental leadership, as further detailed in Table 254.

Table 254. The Most Important Program Benefit to Participants

Benefit Type	Specific Benefit(s)
Decision-making	• Being able to "see the long-term savings through the modeling," which "gave an extra look at other measures we wouldn't have thought of otherwise" and "helped create the most efficient building possible" (5 respondents)
Project management	• "Having a third party to organize the project" helped by "getting everyone involved on the same page" (3 respondents) • A "second review of the project" (1 respondent)
Financial benefits	• Ongoing cost savings (2 respondents) • Program rebates (2 respondents)
Education	• Efficient buildings support their schools' educational missions (2 respondents)
Environmental leadership	• "Reducing natural resource consumption" is important and "helped us become a role model" (2 respondents)

Source: Q29. "In your opinion, what is the single most valuable benefit of participating in the Design Assistance Program?"

Design Team Satisfaction

Design team members gave the Program high satisfaction ratings for CY 2013. Thirteen of 14 respondents (93%) said they were "very satisfied" with the Program overall.

Design team members were highly satisfied with the technical assistance they received form the Program. Eleven of 14 respondents (79%) said they were "very satisfied" with the energy modeling services and recommendations they received from the Program Implementer's staff. One respondent who was "somewhat satisfied" said, "Focus on Energy's recommendations are very generic, and designing a hospital has very specific requirements." Another said, "Having too many numbers can be confusing to owners—more simple but targeted graphics would be less overwhelming."

When asked about the Program's most important benefits to design firms, respondents cited five benefit categories, as shown in Table 255. The design team members said the Program assisted them in making project decisions, adding to their professional development, serving clients, developing business opportunities, and being a financial benefit.

Table 255. Most Valuable Benefits to Design Firms

Benefit Type	Specific Benefit
Project decision-making	• Program presentations helped the client make energy-efficient choices by demonstrating lifetime costs and savings using effective visuals (7 respondents)
Professional development	• Verification that their ideas were beneficial to the building's energy performance (4 respondents) • Opportunity to learn about new and different ideas for energy-efficient design options (3 respondents)
Client service	• Improved client relationships by showing the client "we're looking out for you" (3 respondents) • Improved client relationships by helping owner reduce energy use (1 respondent)
Business development	• Participation in the Program helped win new clients (2 respondents)
Financial benefits	• Incentives to the client for making energy-efficient design choices (1 respondent)

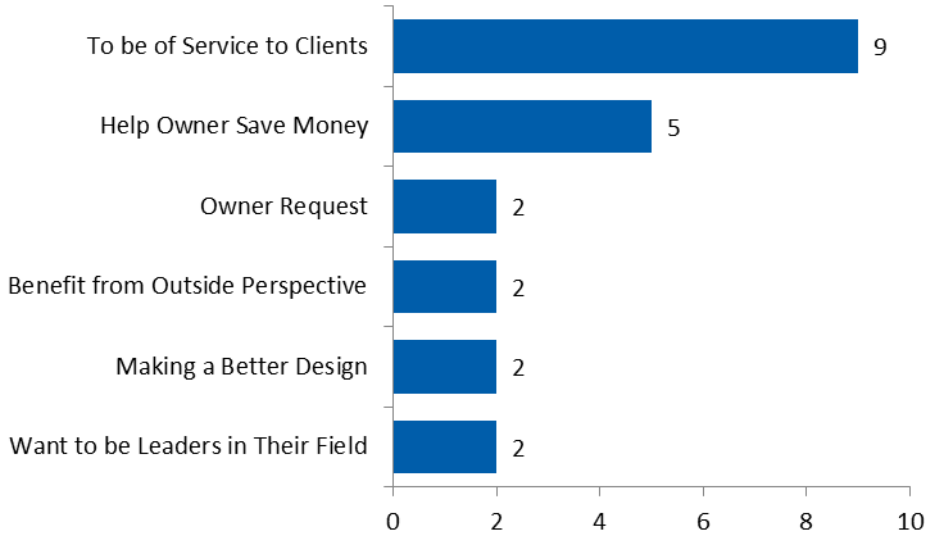
Source: Q19. "What are the most valuable benefits to design firms of participating in the Design Assistance Program?"

Design Team Motivations

When asked what the most important reasons for participating in the Program were, design team members most frequently said the Program allowed them to be of service to clients, as shown in Figure 208. Others most reasons to participate included saving money for clients, participating at the owner's request, gaining an outside perspectives, having a better building design, and wanting to be a leading design professional.

None of the design team members said that the design team incentive played a part in their decision to participate in the Program. One design professional admitted being unaware of the design team incentive until after enrolling a project in the Program. Another said, "I would rather have incentive funds go to improving the Program or towards client incentives than to pay the design professionals—we then reap the benefit of happy customers and improved resources."

Figure 208. Most Important Reasons Design Professionals Participated in the Program



Source: Q6. "What were the most important reasons that your firm decided to participate in the Design Assistance Program?"(n=14; multiple responses allowed)

Key Program Processes

The Program's design employs five major processes for delivering design assistance:

- Enrollment
- Energy modeling and recommendations
- Quality assurance/quality control (QA/QC)
- Verification
- Incentive approval and payment

As of early January 2014, only two projects had reached the verification phase, and neither of the participants had received an incentive check. Therefore, this evaluation focuses on the three early processes (enrollment, energy modeling and recommendations, and QA/QC), for which sufficient data was available to report meaningful findings.

Enrollment

Project teams enter the Program through an online enrollment wizard. The Program Implementer reviews each submission and refers the applicant to a Program Implementer Project Manager or to another Focus on Energy program, as appropriate.

Most Program participants and design teams reported they were very satisfied with the enrollment process. Eleven of the 12 participants (92%) said they had no difficulties with the enrollment process. Ten of the 12 (83%) said they were "very satisfied" with the time it took to receive preapproval from the Program. Thirteen of 14 design team members (93%) said the process was clear and easy to complete.

Energy Modeling and Recommendations

Participants and design team members also reported high satisfaction with the Program's energy modeling services and recommendations. Ten of 12 participants (83%) and 11 of 14 design team members (79%) said they were "very satisfied" with the Program's energy modeling services and recommendations.

A small group (3 of 14 or 21%) of design team members reported that incorporating the energy modeling and recommendations into projects' design process created challenges. Two respondents said that the Program was too slow in providing information the project teams needed. The third respondent had enrolled in the Program relatively late in the design process and said that the Program required the project team to repeat discussions that they had already covered.

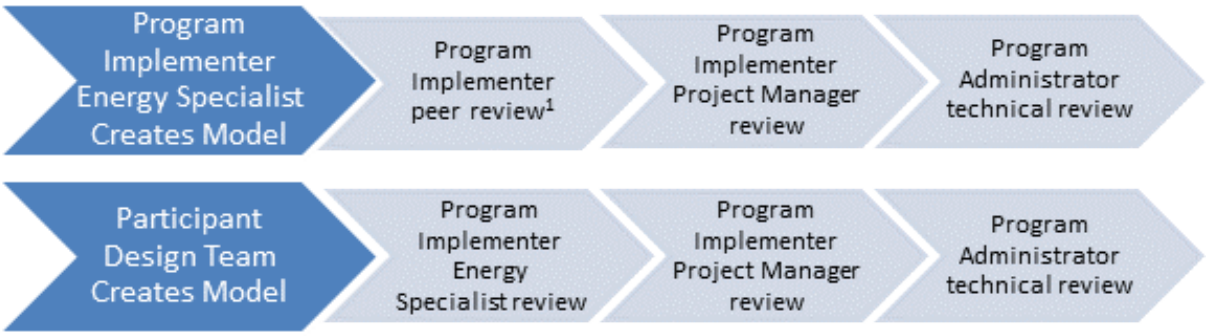
When asked how the Program could improve the value of its technical assistance, design team members said they needed the following:

- Tools that are sufficient to model everything a project team might design for all building components
- Faster model turnaround
- Benchmarking based on Midwest averages, not national averages
- Specific equipment recommendations (participants currently need to get equipment specifics, such as make and model ,from contractors/vendors)

Quality Assurance/Quality Control

The Program's QA/QC process mandates that at least three reviewers check each energy model (whether traditional or NEO). Figure 209 shows the Program's QA/QC procedures in place for reviewing energy models, depending on the model's source.

Figure 209. Design Assistance Program Energy Model QA/QC Paths



[1]A peer is an energy specialist or project manager who does not have direct responsibility for the project

As described in the Impact Evaluation section, the Evaluation Team reviewed three Program models (two created by Implementer staff and one created by a project team) and noted several areas in which the simulation model developers could adopt different approaches to better meet the requirements of ASHRAE Standard 90.1-2007. The Program's QA/QC processes do not appear to have identified or addressed these areas of concern.

Program Cost-Effectiveness

Evaluators commonly use cost-effectiveness tests to compare the benefits and costs of a demand-side management program. The benefit/cost (B/C) test used in Wisconsin is a modified version of the total resource cost (TRC) test. Appendix I includes a description of the TRC test.

Table 256 lists the CY 2011-2013 incentive costs for the Design Assistance Program.

Table 256. Design Assistance Program Incentive Costs

	CY 2013
Incentive Costs	$102,167

The Evaluation Team found the CY 2013 Program to be cost-effective (a TRC benefit/cost ratio above 1). Table 257 lists the evaluated costs and benefits.

Table 257. Design Assistance Program Costs and Benefits

Cost and Benefit Category	CY 2013
Administration Costs	$232,216
Delivery Costs	$948,234
Incremental Measure Costs	$147,195
Total Non-Incentive Costs	$1,327,645
Benefits	
Electric Benefits	$949,785
Gas Benefits	$155,882
Emissions Benefits	$391,985
Total TRC Benefits	$1,497,652
Net TRC Benefits	**$170,007**
TRC B/C Ratio	**1.13**

Evaluation Outcomes and Recommendations

The Design Assistance Program achieved some successes, such as high participant and design team satisfaction. It also faced some challenges, which the Evaluation Team addresses in this section.

Outcome 1. While the Program addresses several key barriers participants face when designing efficient buildings, it can do more to mitigate them.

- ***Barrier 1. Finding design and construction professionals with sufficient technical knowledge.*** Difficulties finding knowledgeable professionals can limit the number of participants willing to participate in the Program as well as the fraction of theoretical savings that participants achieve in reality.
- ***Barrier 2. Unfamiliarity with new technology.*** Unfamiliar technology places two burdens on building owners and developers. First, building owners must incur costs to familiarize operations and maintenance staff with new technology. Second, it introduces uncertainty in the decision-making process. This type of uncertainty can bias decision-makers against implementing new energy-efficient technologies.
- ***Barrier 3. Difficulties with government regulation and lack of coordination.*** Navigating government and regulatory processes is a challenge common to constructing nearly all new buildings, not only energy-efficient ones. However, project teams may face additional scrutiny and challenges when government rules and officials do not accommodate new or evolving energy-efficient design practices. These additional challenges could discourage potential participants from enrolling in the Program or pursuing design strategies that might be perceived as controversial.

Recommendation 1. Based on current information, the Evaluation Team suggests the following potential strategies to help mitigate the three barriers described above.

- *Barrier 1. Insufficient design and construction expertise*
  - Create a referral mechanism to help building owners and developers find qualified design and construction professionals
  - Identify areas of expertise in which qualified professionals are not readily available, and fill the gaps through training or identifying experts in other geographic areas
- *Barrier 2. Lack of familiarity with new technologies*
  - Create or modify training programs to teach building operations and maintenance staff how to operate energy-efficient technologies
  - Establish a demonstration facility so participants can observe strategies in action
  - Locate building owners who were early adopters of particular technologies, and connect Program participants with them via case studies or a peer knowledge-sharing initiative
- *Barrier 3. Government and coordination obstacles*
  - Offer training to improve government officials' understanding of new energy-efficient technologies and design practices
  - Facilitate dialogue between localities and project teams to help them understand each other's decisions and needs, such as presenting the Program's energy efficiency recommendations and rationales to government officials (with project teams' approval)

Outcome 2. The Program's QA/QC process may lack sufficient rigor.

The Evaluation Team reviewed three Program energy models and concluded that each deviated from the requirements of ASHRAE Standard 90.1-2007. This standard is roughly equivalent to the 2009 International Energy Conservation Code, on which Wisconsin's energy code is based. In each case, energy savings appeared to have been overestimated for at least one building system, and in two cases, overall energy savings appeared to have been overestimated. The Evaluation Team observed these deviations in Program-generated and project team-generated models.

Recommendation 2. Conduct a QA/QC review and develop strategies to address any gaps in QA/QC practices. For example:

- Create and regularly update a checklist of common errors to look for, such as misapplication of ASHRAE Standard 90.1-2007 modeling guidance or modeling based on assumptions that vary from the project's design documents
- Create an accountability tracking mechanism to monitor reviewers' performance
- Create additional QA/QC safeguards for project teams' self-generated models such as a self-QA/QC checklist for project teams to fill out and submit along with their models
- Train Administrator and Implementer staff on effective QA/QC practices

Outcome 3. Results suggest design team incentives may not play a significant role in attracting teams to the Program. However, small sample sizes suggest caution in making wholesale changes without further Program experience and input from Program participants and design teams.

None of the interviewed design team members said that the design team incentive played a part in their decision to participate in the Program. Design team members rated professional development and help with project decision-making as the most important Program benefits to design firms; none of the respondents mentioned the design team incentive as an important Program benefit.

Recommendation 3. During the Program's second year, gather further insights about the need for design team incentives. For example, discuss the following ideas with owners and design teams:

- Whether funds should be shifted to owner incentives (as one design team member suggested).
- Whether funds should be shifted to areas design professional might value more, such as professional development (e.g., training, recognition) or project decision-making (e.g., design stakeholder meetings or upgrading presentation materials)

Renewable Energy Competitive Incentive Program

The Renewable Energy Competitive Incentive Program (the Program) offers financial incentives for eligible cost-effective, renewable-energy projects to Wisconsin business customers through a competitive bid process. The Program Implementers (Franklin Energy for customers eligible for the Business Incentive Program; Leidos for customers eligible for the Large Energy Users Program [88]) deliver the Program according to the custom program path requirements of the Business Incentive and Large Energy Users Programs.

In 2013, the Program offered incentives of 10% to 40% or 50% (depending on the request for proposal [RFP]) of eligible renewable energy project costs, not to exceed maximum incentive award amounts for each technology type. The Program Administrator calculated incentive amounts based on the projects' cost per kW, kWh, and Therm energy production, project cost-effectiveness, and project simple payback. The Program Administrator was responsible for technical review of projects during the bid process and assigns the customer to the appropriate Program Implementation team.

Since the Program's launch in late CY 2012, customers have installed more than 20 renewable-energy projects. This analysis includes projects that reached completion in late CY 2012 through December 31, 2013. Evaluation activities were primarily completed from January through April 2014.

The Program Administrator did not introduce any major changes to Program design in CY 2013; however, it did make minor changes to the proposal requirements, evaluation criteria, and project scoring.

Table 19 lists a summary of the Program's targets and actual spending, savings, participation and cost-effectiveness.

Table 258. Renewable Energy Competitive Incentive Program Performance Summary

Item	Units	CY 2013 Actual Amount
Incentive Spending	$	$ 935,744
Verified Gross Life-Cycle Savings	kWh	12,306,232
	kW	323
	therms	619,996
Net Annual Savings	kWh	635,784
	kW	335
	therms	36,639
Participation	Customer Facilities	22
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	0.47

[88] Leidos is formerly a division of Science Applications International Corporation (SAIC).

Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted impact and process evaluations for CY 2013 between August 2013 and April 2014. The key questions that directed the Evaluation Team's design of the EM&V approach were:

- What are the verified gross and net electric and gas savings (generation?)?
- How effective and efficient are the Program's operations?
- How can the Program's delivery processes cost-effectively increase its energy and demand savings?
- How effective are the Program's marketing, outreach, and communication efforts in reaching targeted customers and influencers?
- What are the barriers to increased customer participation, and how effectively is the Program overcoming these barriers?
- How satisfied are customers and Trade Allies with the Program?
- Is the Program meeting cost-effectiveness requirements?
- How can Focus on Energy improve Program performance?

The Evaluation Team designed its EM&V approach to integrate multiple perspectives in assessing Program performance. Table 20 lists the data collection activities and samples sizes used to evaluate the Program.

Table 259. Program Data Collection Activities and Sample Sizes

Activity	CY 2013 Sample Size (n)
Impact	
Project Audit and On-Site Inspection	11
Project Audit Only	4
Process	
Participant Customer Surveys	7
Participant Trade Ally Interviews	6
Stakeholder Interviews	5

Table 260 lists the measure specific data collection activities and sample sizes, by measure group, used to evaluate the Program.

Table 260. Measure Specific Program Data Collection Activities and Sample Sizes[1]

Activity	CY 2013 Sample Size (n)[1]
Site Measurement and Verification	
Geothermal	0
Solar Photovoltaic	10
Solar Thermal	0
Wind	1
Audit of Project Measures Installed	
Geothermal	3
Solar Photovoltaic	0
Solar Thermal	1
Wind	0

[1]Biogas/biomass projects that obtained approval through one of the legacy programs and reached completion in CY 2013 are addressed in the Business Incentive Program evaluation.

[2]All systems incented under the Business Incentive Program, except two solar photovoltaic systems in the Large Energy Users Program.

Data Collection Activities

Table 261 summarizes the project audits completed for each technology category, including projects that received both a project audit and on-site inspection.

Group 1 technologies include biomass, biogas, and ground source heat pumps systems.

Group 2 technologies include solar photovoltaic, solar thermal, and wind systems.

Table 261. Renewable Energy Competitive Incentive Program Impact Activities by Measure Group

Measure Group	Project Audit Only	Project Audit and On-Site Inspection
Business Incentive Program		
Geothermal	3	0
Group 1 Total	**3**	**0**
Solar Photovoltaic	0	8
Solar Thermal	1	0
Wind	0	1
Group 2 Total	**1**	**9**
Business Incentive Program Total	**4**	**9**
Large Energy Users Program		
Group 1 Total[1]	**0**	**0**
Solar Photovoltaic	0	2
Group 2 Total	**0**	**2**
Large Energy Users Program Total	**0**	**2**
Renewable Energy Competitive Incentive Program Total	**4**	**11**

[1]Note: The Large Energy Users Program did not have any Group I measures.

Impact Evaluation

In addition to reviewing Program tracking database (SPECTRUM) for each technology included in the evaluation, the Evaluation Team conducted a combination of project audits and on-site inspections.

Project Audits

The Evaluation Team conducted a thorough engineering review of project documentation to support audits of all geothermal and solar thermal projects. Documentation found in the SPECTRUM database was, in most cases, adequately complete to assess project performance and realization rate. However, in a few cases, the Evaluation Team requested additional system information from the Program Implementers.

For CY 2013 and CY 2014, PSC Order 5-GF-191 requires Focus on Energy to allocate 75% of the total incentives funding to Group 1 and 25% to Group 2 technologies.[89] This incentive allocation encourages the generation of cost-effective renewable energy from the vast amount of waste produced by Wisconsin's agriculture, food processing, and paper production industries.

On-Site Inspections

The Evaluation Team selected the wind, solar thermal, and solar photovoltaic sites for on-site inspections due to the strong influence that observable siting factors (e.g., obstacles to wind or solar

[89] Docket 5-GF-191 (April 27, 2012).

resource) can have on system performance.[90] In order to allow sufficient time for scheduling, inspections, reporting, and analysis, the Evaluation Team selected a sample group of photovoltaic systems from projects completed in October 2013 (six months after the April incentive awards) and then conducted site visits for these sample projects in November 2013. The Evaluation Team visited the only completed wind project and collected siting information, including inverter and meter readings, shading, tilt, and orientation data for solar photovoltaic systems and obstruction data at the wind site.

Measurement and Verification

The Evaluation Team did not directly measure the performance of any systems. Solar photovoltaic and wind systems track production at the inverter and, thus, additional direct measurement would have yielded little if any insight into system performance. In addition, the evaluation timeframe spanned only a partial year and, thus, would have required extrapolation of measured data to a typical meteorological year.

Process Evaluation

For the process evaluation, the Evaluation Team tailored its data collection activities to solicit feedback from Program stakeholders, customers, and Trade Allies.

Stakeholder Interviews

The Evaluation Team conducted six interviews in August 2013 with Program stakeholders—five with staff members from the Program Implementers and one with two staff members from the Program Administrator. Through the interviews, the Evaluation Team:

- Gathered information about the Program's enrollment and delivery processes
- Collected feedback regarding the Program's successes and challenges
- Clarified evaluation research priorities

Trade Ally Interviews

In January 2014, the Evaluation Team conducted six interviews with Trade Allies who were involved with the awarded projects in CY 2012 and CY 2013 to assess:

- Program involvement and experiences
- Trade Ally perceptions of Program effectiveness
- Satisfaction with incentives and delivery processes
- Areas for improvement

[90] Note that, in cases where there are few or no obstructions to solar wind resource, and systems are installed according to best practices, system performance is typically driven by system capacity and availability, in addition to weather variations against a typical meteorological year.

Participant Customer Interviews

The Evaluation Team conducted seven interviews in December, 2013 with participating customers who received proposal awards in CY 2012 or CY 2013 to assess:

- Customer Influences and decision-making processes
- Barriers and benefits to Program participation and project installation
- Customer satisfaction with the implementation and delivery of Program offerings
- Areas for improvement
- Freeridership and spillover activities

As shown in Table 262, the Program classifies eligible renewable-energy technologies into two groups: Group 1 (biomass, biogas, and geothermal technologies[91]) and Group 2 (wind, solar thermal, and solar photovoltaic). To understand the breadth of participant experiences with the Program, the Evaluation Team conducted interviews with participants across Group 1 and Group 2 technologies. Interviewed participants included a school district, dairy farm, municipality, real estate firm, and small and large businesses.

Table 262. Customer Interviews by Technology and Customer Type[1]

Technology	Number of Interviewees			
	Customer Type			Total
	Business	Schools and Government	Agriculture	
Biogas	-	-	1	1
Biomass	-	1	-	1
Geothermal	1	-	-	1
Group 1 Total				**3**
Solar Photovoltaic	3	1	-	4
Solar Thermal	-	-	-	0
Wind	-	-	-	0
Group 2 Total				**4**

[1] The Evaluation Team's interviews included projects that were enrolled in the Program but not yet completed in CY 2013.

Database Analysis

The Evaluation Team analyzed the Program database to determine the number of days between estimated project start date and estimated project completion date for Group 1 and Group 2

[91] For geothermal technologies, the Evaluation Team assessed only ground source heat pumps.

technologies. This analysis used a database extract dated February 5, 2014. Changes to the database after this date were not included in this evaluation.

Impact Evaluation

The Evaluation Team determined gross savings using the methodologies outlined in the CY 2013 Renewable Energy Competitive Incentive Program Evaluation Plan.

Evaluation of Gross Savings

To determine gross Program savings, the Evaluation Team assessed all of the systems either through on-site inspection or project audit, with the exception of seven solar photovoltaic systems which the Evaluation Team could not visit due to customer unavailability—for these systems, the Evaluation Team estimated gross savings based on the samples. Table 263, Table 264, and Table 265 list gross savings for the Business Incentive Program, the Large Energy Users Program, and the overall totals for the Renewable Energy Competitive Incentive Program.

Geothermal systems were the only technology included from Group 1 that the Evaluation Team assessed during the CY 2013 evaluation, and this technology primarily offset the use of natural gas. Geothermal systems supplied approximately 93% of the natural gas savings for Business Incentive Program renewables measures, but negatively impacted the overall Program electricity savings due to the electricity consumption of the new geothermal systems.

Because the geothermal systems still offset summer electricity used for air conditioning, however, the demand savings were nearly equally attributable to Group 1 and Group 2 technologies. Table 263 lists the percentage of savings by group and fuel level for the Business Incentive Program.

Table 263. Business Incentive Program Renewables Measures Verified Gross Savings Contribution

Measure Group	Percentage of Total Savings		
	kWh	kW	Therms
Geothermal	-30%	48%	93%
Group 1 Total	**-30%**	**48%**	**93%**
Solar Photovoltaic	104%	52%	0%
Solar Thermal	-1%	0%	7%
Wind	27%	0%	0%
Group 2 Total	**130%**	**52%**	**7%**
Business Incentive Program Total	**100%**	**100%**	**100%**

Table 264 lists the percentage of savings by group and fuel level for the Large Energy Users Program.

Table 264. Large Energy Users Program Renewables Measures Verified Gross Savings Contribution

Measure Group	Percentage of Total Savings		
	kWh	kW	Therms
Solar Photovoltaic	100%	100%	0%
Group 2 Total	**100%**	**100%**	**0%**
Large Energy Users Program Total	**100%**	**100%**	**N/A**

Table 265 lists the percentage of savings by group and fuel level for the Renewable Energy Competitive Incentive Program.

Table 265. Renewable Energy Competitive Incentive Program Verified Gross Savings Contribution[1]

Measure Group	Percentage of Total Savings		
	kWh	kW	Therms
Geothermal	-19%	37%	93%
Group 1 Total	**-19%**	**37%**	**93%**
Solar Photovoltaic	102%	63%	0%
Solar Thermal	-1%	0%	7%
Wind	18%	0%	0%
Group 2 Total	**119%**	**63%**	**7%**
Renewable Energy Competitive Incentive Program Total	**100%**	**100%**	**100%**

[1] Renewable Energy Competitive Incentive Program results represent the aggregate of the results for the Business Incentive and Large Energy Users Programs.

To calculate gross savings, the Evaluation Team reviewed the Program tracking data and then combined them with data from the participant surveys. To calculate net savings, the Evaluation Team used participant survey data to determine freeridership and spillover.

Tracking Database Review

SPECTRUM is the primary source of project information for on-site inspections and project audits. The key data the Evaluation Team used from SPECTRUM for the CY 2013 analysis included:

- Customer contact information
- Baseline equipment and building conditions
- Characteristics of Renewable Energy Competitive Incentive Program-funded projects (system size, type, key parameters)
- Expected energy and demand savings

Implementer staff and contractors input this information and other data into the SPECTRUM database.

The Evaluation Team reviewed the CY 2013 data in SPECTRUM for completeness and quality. The data were thorough and complete; SPECTRUM generally contained all of the data fields necessary to evaluate

the Program. In general, the extent and quality of project documentation will increase with project complexity. The Evaluation Team consistently found supplemental documentation such as savings worksheets and calculations performed by participants or third-party contractors in SPECTRUM. In very few cases, the Evaluation Team contacted the installer for supplemental data.

The Evaluation Team generally found that application documents aligned with applicant, facility, and measure-eligibility requirements.

Gross Savings and Verified Gross Savings Analysis

The Evaluation Team calculated gross savings according to the evaluation methodologies outlined in the Program's strategic evaluation plan. For retrofit projects, the Evaluation Team estimated baseline energy consumption and demand using baseline equipment specifications, utility data, and publicly available reference materials. For new construction, the Evaluation Team estimated energy consumption and demand using assumed equipment specifications.

Realization Rates

Table 3 lists realization rates for each program.

Business Incentive Program Realization Rates

The Business Incentive Program measures achieved:

- An evaluated realization rate of 35% of the predicted gross electricity savings
- A realization rate of 166% of the predicted gross therm savings
- A realization rate of 37% of the predicted demand savings

The majority of the fuel-specific variability is due to a single large geothermal project for a new construction application that the installer proposed to offset a completely electric heating and cooling baseline. The Evaluation Team used an alternative natural gas heating baseline that shifted some savings from electricity to gas; this resulted in a negative realization rate for electricity savings. The customer's pre-installation estimates assumed an all-electric baseline heating system, an unrealistic choice for the site given the availability of natural gas and current (and projected) fuel costs.

When analyzing total energy savings (MMBtu), the Evaluation Team found the Business Incentive Program achieved an evaluated realization rate of 82%. Overall, the Business Incentive Program nearly met its projected overall energy savings. (Although the realized savings emphasized offsetting natural gas consumption rather than reducing electricity consumption as originally expected). Realization rates by technology, as shown in Table 3, generally met or exceeded 90% except for geothermal/Group 1 projects. This result was largely due to optimistic electricity savings estimates for two of three geothermal projects.

Table 3 lists realization rates by fuel type and measure for the Business Incentive Program.

Table 266. Business Incentive Program Realization Rates by Measure

Measure Group	Realization Rate			
	(kWh)	(kW)	(Therms)	(MMBtu)
Geothermal	-19%	23%	174%	71%
Group 1 Total	**-19%**	**23%**	**174%**	**71%**
Solar Photovoltaic	111%	82%		111%
Solar Thermal	307%		107%	104%
Wind	90%			90%
Group 2 Total	**105%**	**82%**	**107%**	**106%**
Business Incentive Program Total[1]	**35%**	**37%**	**166%**	**82%**

[1]Realization rates are not additive, as some technologies contribute more savings than others. Totals reflect weighted averages.

Large Energy Users Program Realization Rates

The Large Energy Users Program achieved an evaluated realization rate of 111% of the predicted gross electricity (total energy) savings and a realization rate of 11% of the predicted gross demand savings. The Evaluation Team did not predict therm savings for either project. Table 267 lists the realization rates for the two projects analyzed under the Large Energy Users Program. The low realization rate for solar photovoltaic demand savings is due to unrealistically high estimates for systems in the Large Energy Users Program.[92]

Table 267. Large Energy Users Program Realization Rates by Measure

Measure Group	Realization Rate			
	kWh	kW	Therms	MMBtu
Solar Photovoltaic	111%	11%		111%
Group 2 Total	**111%**	**11%**	**-**	**111%**
Large Energy Users Program Total	**111%**	**11%**	**-**	**111%**

[92] SPECTRUM included demand savings estimates of 40 kW for a single 40 kW photovoltaic system, as well as 642 kW for a single 115 kW photovoltaic system for the two Large Energy Users projects.

Renewable Energy Competitive Incentive Program Realization Rates

Overall, the Program achieved an evaluated realization rate of 47% of the predicted gross electricity savings, a realization rate of 24% of the predicted gross demand savings, and 166% of the predicted gross therm savings. On a total energy basis, all of the evaluated projects achieved an 85% realization rate.

Table 268 lists the overall (Business Incentive and Large Energy User Programs) realization rates for each measure included in the Renewable Energy Competitive Incentive Program.

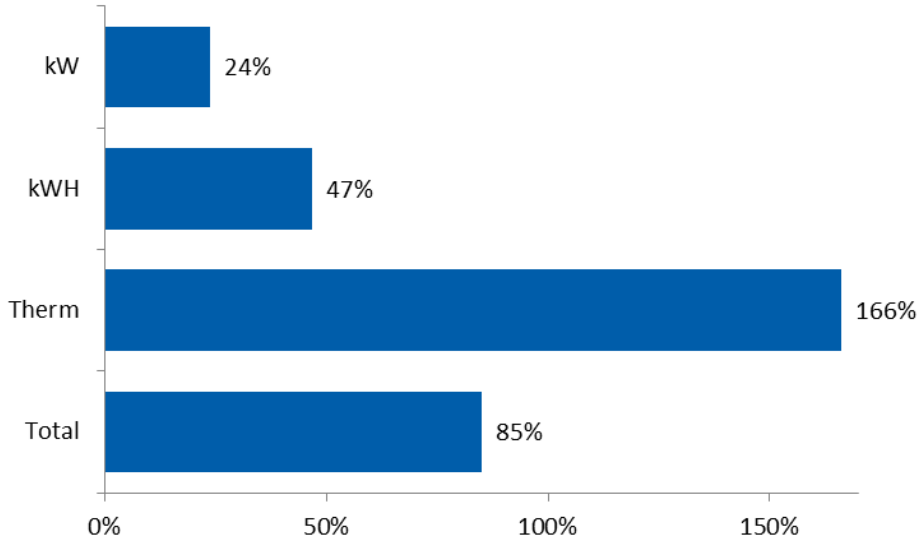
Table 268. Renewable Energy Competitive Incentive Program Realization Rate by Measure

Measure Group	Realization Rate			
	kWh	kW	Therms	MMBtu
Geothermal	-19%	23%	174%	71%
Group 1 Total	**-19%**	**23%**	**174%**	**71%**
Solar Photovoltaic	111%	24%	-	111%
Solar Thermal	307%	-	107%	104%
Wind	90%	-	-	90%
Group 2 Total	**108%**	**24%**	**107%**	**107%**
Renewable Energy Competitive Incentive Program Total[1]	**47%**	**24%**	**166%**	**85%**

[1]Realization rates are not additive, as some technologies contribute more savings than others. Totals reflect weighted averages.

Figure 210 shows the realization rate by fuel type.

Figure 210. Renewable Energy Competitive Program Realization Rate by Fuel Type



Summary of Gross and Verified Gross Savings

Table 269 lists projected gross and verified gross savings for each measure. The Evaluation Team used estimates from SPECTRUM for projected gross savings using the methodologies previously described to determine verified gross savings.

Summary of Business Incentive Program Gross and Verified Gross Savings

Table 269 lists the reported and verified gross savings, by measure type, achieved by the Business Incentive Program.

Table 269. Business Incentive Program Gross Savings Summary

Project Type	Reported Gross			Verified Gross		
	kWh	kW	Therms	kWh	kW	Therms
Annual						
Geothermal	627,990	525.0	18,912	-119,334	119.4	32,815
Group 1 Annual	**627,990**	**525.0**	**18,912**	**-119,334**	**119.4**	**32,815**
Solar Photovoltaic	369,641	159.8	-	410,256	130.9	-
Solar Thermal	-1,108	-	2,349	-3,400	-	2,517
Wind	120,650	-	-	108,580	-	-
Group 2 Annual	**489,183**	**159.8**	**2,349**	**515,436**	**130.9**	**2,517**
Total Annual Savings	**1,117,173**	**684.8**	**21,261**	**396,102**	**250.3**	**35,332**
Life-Cycle						
Geothermal	12,326,815	525.0	328,305	-2,342,407	119.4	569,656
Group 1 Life-cycle	**12,326,815**	**525.0**	**328,305**	**-2,342,407**	**119**	**569,656**
Solar Photovoltaic	7,392,801	159.8	-	8,205,099	130.9	-
Solar Thermal	-22,160	-	46,980	-68,000	-	50,340
Wind	2,413,000	-	-	2,171,600	-	-
Group 2 Life-Cycle	**9,783,641**	**159.8**	**46,980**	**10,308,699**	**130.9**	**50,340**
Total Life-Cycle Savings	**22,110,456**	**684.8**	**375,285**	**7,966,292**	**250.3**	**619,996**

Summary of Large Energy Users Program Gross and Verified Gross Savings

Table 270 lists the reported and verified gross savings, by measure type, achieved by the Large Energy Users Program.

Table 270. Large Energy Users Program Gross Savings Summary

Project Type	Reported Gross			Verified Gross		
	kWh	kW	Therms	kWh	kW	Therms
Annual						
Geothermal	-	-	-	-	-	-
Group 1 Annual	-	-	-	-	-	-
Solar Photovoltaic	194,676	682.0	-	216,997	73.2	-
Solar Thermal	-	-	-	-	-	-
Wind	-	-	-	-	-	-
Group 2 Annual	**194,676**	**682.0**	**-**	**216,997**	**73.2**	-
Total Annual Savings	**194,676**	**682.0**	**-**	**216,997**	**73.2**	-
Life-Cycle						
Geothermal	-	-	-	-	-	-
Group 1 Life-cycle	-	-	-	-	-	-
Solar Photovoltaic	3,893,520	682.0	-	4,339,940	73.2	-
Solar Thermal	-	-	-	-	-	-
Wind	-	-	-	-	-	-
Group 2 Life-Cycle	**3,893,520**	**682.0**	**-**	**4,339,940**	**73.2**	**-**
Total Life-Cycle Savings	**3,893,520**	**682.0**	**-**	**4,339,940**	**73.2**	**-**

Summary of Program Reported Gross and Verified Gross Savings

Table 271 lists the reported and verified gross savings, by measure type, achieved by the Renewable Energy Competitive Incentive Program.

Table 271. Renewable Energy Competitive Incentive Program Gross Savings Summary

Project Type	Reported Gross			Verified Gross		
	kWh	kW	Therms	kWh	kW	Therms
Annual						
Geothermal	627,990	525.0	18,912	-119,334	119.4	32,815
Group 1 Annual	**627,990**	**525.0**	**18,912**	**-119,334**	**119.4**	**32,815**
Solar Photovoltaic	564,317	841.8	-	627,253	204.2	-
Solar Thermal	-1,108	-	2,349	-3,400	-	2,517
Wind	120,650	-	-	108,580	-	-
Group 2 Annual	**683,859**	**841.8**	**2,349**	**732,433**	**204.2**	**2,517**
Total Annual Savings	**1,311,849**	**1,367**	**21,261**	**613,099**	**323.5**	**35,332**
Life-Cycle						
Geothermal	12,326,815	525.0	328,305	-2,342,407	119.4	569,656
Group 1 Life-cycle	**12,326,815**	**525.0**	**328,305**	**-2,342,407**	**119.4**	**569,656**
Solar Photovoltaic	11,286,321	841.8	-	12,545,039	204.1	-
Solar Thermal	-22,160	0.0	46,980	-68,000	-	50,340
Wind	2,413,000	0.0	-	2,171,600	-	-
Group 2 Life-Cycle	**13,677,161**	**841.8**	**46,980**	**14,648,639**	**204.1**	**50,340**
Total Life-Cycle Savings	**26,003,976**	**1,367**	**375,285**	**12,306,232**	**324**	**619,996**

Technology-Level Findings

This section presents a comparison of projected[93] and verified gross savings, along with rationales for discrepancies, for each technology/measure type.

[93] According to SPECTRUM.

Solar Photovoltaic

The Program provided incentives for a total of 420 kW of installed capacity.[94] This is expected to result in more than 12.5 million kWh over the life of the funded projects (assuming the effective useful life of photovoltaic systems is 20 years) and approximately 204 kW of demand savings during peak months (summer). Verified energy savings exceeded Program expectations by approximately 11% due to a combination of the following factors:

- Installation of more capacity than expected. For the eight projects inspected during the evaluation, installed capacity was approximately 105% of the target indicated in Program records.
- Shading impacts, as measured with tools like the Solmetric Suneye® or Solar Pathfinder®, may be slightly over-stated in climates with substantial diffuse fractions. The diffuse fraction represents the portion of total radiation composed of diffuse versus direct radiation and varies widely with sky cover (e.g., cloudier climates tend have higher diffuse fractions). In Madison, Wisconsin, for example, approximately 48% of annual global horizontal irradiance is derived from diffuse radiation. By comparison, Phoenix, Arizona, and Albany, New York, derive 27% and 49% of their total solar radiation from diffuse irradiance, respectively.
- Solar photovoltaic module output power, when modules are shipped, is sometimes higher than the nameplate power commonly used in estimating performance with tools like PVWatts®. The purpose of this is to ensure that modules meet production guarantees and similar requirements, even after including performance degradation.[95] This could lead to higher than expected output (1 to %) during the first few years of operation.

Verified demand savings fell short of the expectations by 76%. This deviation is primarily attributable to overestimated demand savings in SPECTRUM for systems in the Large Energy Users Program.

Solar Thermal

For the single solar thermal system evaluated in CY 2013, the Evaluation Team expects the system to slightly exceed energy savings expectations as reported by the applicant. Project teams calculated pre-installation estimates based on the current hot water consumption at the site, but the Evaluation Team based savings estimates on the customer's near-term projections of hot water use, which represented a 47% increase over current volume. However, the electricity consumption estimated in the Program records was lower than the expected consumption used by the Evaluation Team for pumps, controllers, and other ancillary loads.

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[94] Unless otherwise noted, the Evaluation Team reported system capacity for solar photovoltaic as nameplate direct-current values.

[95] The Evaluation Team's energy production estimates did not consider performance degradation, which is typically 0.5% per year.

Geothermal (ground source heat pump)

As noted previously, the Evaluation Team anticipates that the geothermal systems included in the CY 2013 evaluation will generally meet the overall expected energy savings. However, the Evaluation Team did observe a significant issue with the baseline assumptions used for one new construction project.[96] The project team proposed a baseline heating system consisting of electric resistance heating and central air conditioning. Though this method is consistent with ASHRAE (which stipulates that the system use the same fuel for both baseline and efficient conditions), the Evaluation Team recommends revaluating the proposed baseline as electric heating does not represent a reasonable baseline for the Wisconsin climate where less expensive natural gas heating is more common for commercial heating applications. The Evaluation Team confirmed the availability of natural gas at the site with the Program Implementer. Furthermore, the Program's online FAQ indicates that electric resistance heating is only to be used as a baseline for geothermal projects at new construction sites when natural gas is not available.

Wind

The Evaluation Team anticipates that the one wind site it analyzed will generate approximately 90% of the expected electricity savings.

Evaluation of Net Savings

This section describes how the Evaluation Team assessed net Program savings.

Net-to-Gross Analysis

This section provides findings and commentary specific to the Business Incentive Program. For a detailed description of net-to-gross analysis methodology, please refer to Appendix L.

Freeridership Findings

The Evaluation Team used the self-report and standard market practice approaches to determine the Program's freeridership level. Overall, the CY 2013 Program had 0% freeridership across all respondents.

During interviews, customers and Trade Allies said that funding from Focus on Energy was integral to the installation of renewable-energy projects. Customers provided the following feedback about the importance of Program incentives in their projects' installations:

- One customer said, "If we didn't get the grant we weren't going to proceed with it [the project]."
- Another customer said his organization decided not to install the project after speaking to an installation contractor and receiving a quote because the project was too expensive. This customer put the project on hold, but was able to install the solar project once Focus on Energy awarded their Program incentive.

[96] Note that this caused the negative realization rate reported for electricity savings attributable to GSHP and Group 1 overall, as the savings were re-allocated to natural gas as a more realistic baseline.

Trade Allies also reported that they believed freeridership among customers was low.

- One Trade Ally said, "[the Program incentive] makes our renewable-energy systems more affordable… [It's the] difference between buying and not buying [a renewable-energy system]."
- A few Trade Allies reported that some customers may have gone forward with a partial installation; however, they believed customers would not have been able to install projects of the same size or within the same year.

Although freeridership was 0% for CY 2013, the Evaluation Team anticipates that freeridership in future years will likely be higher. The Evaluation Team calculated freeridership based on customer responses to five self-report surveys. The Evaluation Team excluded two additional self-report surveys from freeridership analysis for this evaluation because participants had not completed their projects by the end of CY 2013. One customer, not included in the CY 2013 freeridership analysis, had approximately a 12.5% freeridership score. The Evaluation Team also gathered qualitative insights from a Trade Ally who indicated that the Program design may not be optimal for minimizing freeridership going forward (See Trade Ally Perceptions of Program Effectiveness).

Spillover Findings

The Evaluation Team estimated participant spillover based on self-report survey data. Table 32 shows the spillover savings survey respondents attributed to the Program.

Table 272. Renewable Energy Competitive Incentive Program Spillover Measures

Measure Name	Quantity	Per-Unit kWh Savings	Total Spillover kWh Savings	Total Spillover MMBtu Savings
LED Outside Wall Packs	14	784	10,976	37.5
Total	**14**	**-**	**10,976**	**37.5**

As shown in Table 33, the Evaluation Team estimated spillover as 0.5% of Renewable Energy Competitive Incentive Program savings.

Table 273. Renewable Energy Competitive Incentive Program Spillover Estimate

Spillover MMBtu Savings	Program MMBtu Savings[1]	Spillover Percentage
37.5	5,624	4%

[1] CY 2013 evaluated gross energy savings.

Net-to-Gross Ratio

The Evaluation Team calculated an overall Business Incentive Program net-to-gross estimate of 104%, as

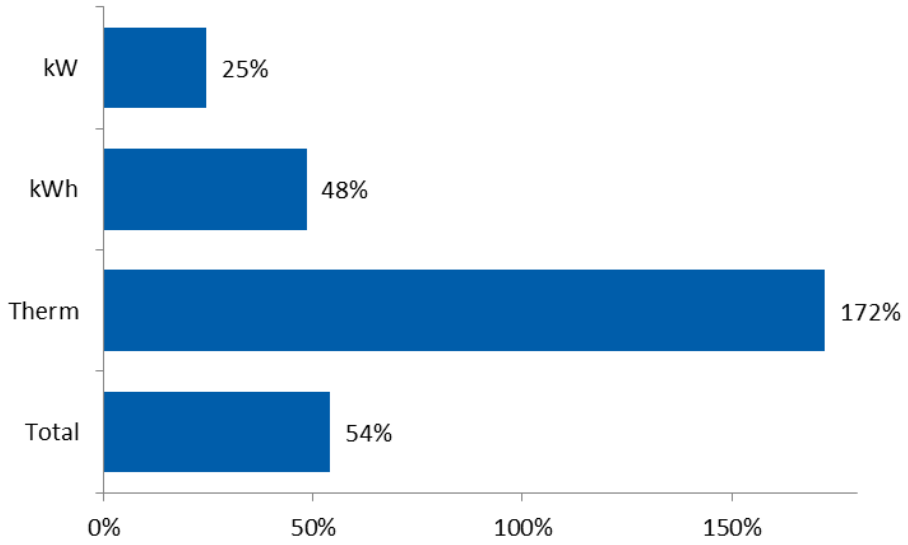
Table 74 shows.

Table 274. Program Freeridership, Spillover, and Net-to-Gross Estimates

Freeridership	Spillover	Net-to-Gross
0%	0.5%	104%

Figure 211 shows the net savings as a percentage of the *ex ante* gross savings by fuel type.

Figure 211. Renewable Energy Competitive Incentive Program Net Savings as a Percentage of *Ex Ante* Savings by Fuel Type



Process Evaluation

Introduction

The purpose of the CY 2013 process evaluation was to gather feedback about the customers' and Trade Allies' experiences with the Program and to determine the effectiveness of the delivery and implementation processes. In addition to the overall research questions, the Evaluation Team sought answers to several important process-related questions:

- How are business customers and Trade Allies learning about the Program and how would they like to learn about Program opportunities in the future?
- What are customers' behaviors and decision-making practices regarding renewable energy technology adoption and installation?
- What are customers' perceived benefits of Program participation and installation of renewable energy technologies?
- What are Trade Ally roles and involvement in the Program, including customer promotion and experience with the competitive bid process?
- How effectively is the program encouraging Trade Allies and customers to participate in the Program and complete renewable energy projects?

- What are the barriers to customer participation for the technologies included, and how effectively is the Program overcoming these barriers?
- How satisfied are customers, Trade Allies, and stakeholders with the Program's enrollment, incentives, and delivery processes?

The Evaluation Team gathered feedback about the Program through interviews with stakeholders, Trade Allies, and customers (see Table 20).

Program Design, History, and Goals

The Program offers Wisconsin business customers financial incentives for eligible cost-effective, renewable-energy projects through a competitive bid process. Wisconsin Statute (Wis. Stat. § 196.374) requires the Focus on Energy portfolio to include renewable-energy technologies. Public Service Commission of Wisconsin Order 5-GF-191 requires that the portfolio's benefit/cost ratio must be at least 2.3 and portfolio-wide energy savings must not decrease more than 7.5% with the inclusion of renewable energy. [97]

As previously described in this chapter, the Program classifies eligible renewable energy technologies into two groups: Group 1 (biomass, biogas, and geothermal technologies) and Group 2 (wind, solar thermal and solar photovoltaic). In CY 2013, Focus on Energy allocated 75% of incentives for Group 1 technologies and the remaining 25% to Group 2 technologies.

Neither the Program Administrator nor the Program Implementer reported specific energy-savings goals for CY 2013. However, the PSC (in consultation with the Program Administrator) determined that each year the renewable energy measure mix and funding level will be contingent on the portfolio's overall cost-effectiveness. In CY 2012, the PSC allocated $1.5 million for new renewable-energy projects and increased the portfolio's incentives to $4.5 million for eligible renewable-energy projects in CY 2013. Other goals the Evaluation Team identified through the stakeholder interviews include:

- Providing financial support to Wisconsin business customers who have pursued energy efficiency in their facilities and are interested in installing cost-effective renewable energy projects.
- Overcoming funding and technology market barriers associated with renewable-energy projects.

Program Changes

Prior to the Program's launch, Focus on Energy offered renewable-energy technologies through a sector-based legacy program. In CY 2012, Focus on Energy began to offer renewable-energy incentives through the Program, which requires a competitive bidding process. Since CY 2012, the Program Administrator has made important changes to proposal guidelines and proposal evaluation criteria.

[97] Docket 5-GF-191 (April 27, 2012).

Changes to Proposal Guidelines

Focus on Energy has issued three Requests for Proposals (RFPs): one in CY 2012 and two in CY 2013 (February and October).

After reviewing the three RFPs, the Evaluation Team noted differences between them; the Evaluation Team confirmed these differences during interviews with Implementation staff. The Program Administrator said they changed incentive level determination to improve Program cost effectiveness. The Program now awards incentives based on cost-effectiveness and energy production rather than on project cost. Table 275 lists some of the Program changes and differences in the competitive bid process.

Table 275. Program Changes and Differences in Competitive Bid Process

Program Changes	RFP Date		
	August 2012	February 2013	October 2013
Proposal Timelines	Two months between the RFP release date and the proposal due date	One month between the RFP release date and the proposal due date	No change from February 2013
Maximum Allowable Project Costs	$2 million for all renewable energy technologies	Increased to $5 million for biogas and biomass technologies	No change from February 2013
		Decreased to $1 million for geothermal, solar PV, solar thermal, and wind technologies	No change from February 2013
Incentive Level Request	Applicants requested a desired funding amount between $25,000 and $250,000	Focus on Energy reviewers calculated the incentive for applicants (10%-40% of eligible project costs) based on project cost per unit of energy production and project payback	Applicants proposed a $/kWh or $/therm incentive amount and calculated an incentive themselves based on first-year energy production, up to 50% of the total project cost

Source: Materials review of Program RFPs from August 2012, February 2013, and October 2013.

Administrator and Implementer staff said the Program's biggest challenges were helping Wisconsin businesses and Trade Allies get used to the idea of receiving renewable-energy project funding through a competitive bid process and keeping them informed about changes between the RFPs.

Changes to Proposal Evaluation Criteria

The Program Administrator reported that it scores projects against a set of criteria listed in the RFP. Table 276 shows each RFP's slightly different evaluation criteria scoring. Both Trade Allies and Implementer staff expressed some concerns about the competitive bid process' lack of transparency around scoring and project selection.

The Program Administrator described difficulty meeting incentive allocation targets for the year because of uncertainty regarding when customers will complete projects. It reported changing the October 2013 evaluation criteria to reduce uncertainty around project completion dates.

Specifically, the Program Administrator assigned higher proposal evaluation weights for Group 1 projects completed within 18 months and Group 2 projects completed within 12 months, and it implemented committed incentive reductions for customers that do not complete projects by their estimated completion date. Although the Program Administrator did not require applicants to commit to a reduced incentive for completing projects after their proposed deadline, it granted these applicants up to 10 additional proposal points for committing to funding reductions (up to 25% of their award).

Table 276. Competitive Bid Evaluation Criteria and Scoring Weights

Evaluation Criteria	RFP Date		
	August 2012	February 2013	October 2013
First-Year Energy Production	15 points	20 points	-
Cost-Effectiveness	40 points	30 points	50 points
Financial Need	20 points	10 points	-
System Optimization	15 points	15 points	20 points
Life-of-Project Savings	10 points	5 points	-
Payback	-	20 points	-
Project Completion Date	-	-	10 points
Reasonability of Savings Estimate	-	-	10 points
Focus on Energy Impact on Project	-	-	10 points

Source: Materials review of Program RFPs from August 2012, February 2013, and October 2013.

Program Performance

At the end of CY 2013, participants had completed 22 projects and 42 remained in the pipeline. Although the Renewable Energy Competitive Incentive Program has no specific energy savings goals, the PSC requires the Program Administrator to distribute 75% of funding to completed Group 1 technology projects and 25% of funding to completed Group 2 technology projects each year.

As Table 277 shows, at the end of CY 2013 Focus on Energy had distributed only 54% of incentive funding to Group 1 technologies. However, although the Renewable Energy Competitive Incentive Program may not have reached yearly incentive allocation targets during this first year, 90% of the incentives in the pipeline are for Group 1 projects. Thus, the Program is more likely to achieve targets in future Program years.

Table 277. Distribution of Renewable Energy Competitive Incentive Program Funds

Technology Group	Processed Incentives[1]	Percentage	Incentives in Pipeline	Percentage
Group 1	$914,738.00	54.26%	$4,130,629.00	90.62%
Group 2	$770,981.20	45.74%	$427,710.50	9.38%
Total	**$1,685,719.20**	**100.00%**	**$4,558,339.50**	**100.00%**

[1]Includes Incentives for projects not yet reporting savings in CY 2013. CY 2013 Incentives for projects producing savings is $935,744. Table only includes RECIP incentives and does not address other programs (e.g., prescriptive measures) that support these technologies.

According to the Program Administrator, Group 1 projects, specifically biomass and biogas projects, tend to be larger than Group 2 projects and may take several years to complete. Implementer staff explained that several customers asked for extensions for their biomass and biogas projects when they realized they could not complete projects within a year. Group 1 technology projects, on average, take more time to complete than Group 2 technology projects.

Table 278 shows the number of days between estimated project start date and estimated project completion date for the 22 complete projects, based on data in SPECTRUM. On average, Group 1 technology projects are estimated to take 169 more days to complete than Group 2 technology projects; however, substantially fewer participants completed Group 2 systems during the evaluation period. As mentioned in the previous section (Changes to Proposal Evaluation Criteria), the Program Administrator changed the evaluation criteria to reduce uncertainty over when participants complete Group 1 projects to ensure that the Program reaches incentive allocation targets going forward.

Table 278. Number of Days Between Project Start Date and Estimated Project Completion Date

Technology Group	Minimum Number of Days	Maximum Number of Days	Average Number of Days
Group 1	171	579	387
Group 2	42	622	218

Program Management and Delivery

This section described the various Program management and delivery aspects the Evaluation Team assessed.

Program Management and Delivery Structure

The Program Administrator is responsible for issuing RFPs for the Program's renewable-energy incentives, reviewing and scoring the proposals, and selecting projects. After the Program Administrator selects projects and signs the award letters, it provides a list of customer projects, and supporting information, to the Program Implementer. The list includes the customer type and the program for which the customer is eligible (Large Energy User, Chain Stores & Franchises, or Business Incentive Programs), as well as approved energy savings, annual energy cost, and incentive award. The Program

Implementer then works with participating customers to complete the project installation. The Program Implementer is responsible for ensuring proper installation of the renewable projects and accurate estimation of energy savings, verifying installed equipment and, in some cases, verifying the accuracy of energy savings estimates.[98]

Program Data Management and Reporting

The Program Implementer tracks projects in SPECTRUM using procedures similar to those used to track custom projects. Once received, Implementer staff uploads all customer documents (workbooks, applications, agreements) into SPECTRUM. The Evaluation Team identified only minor discrepancies with the data tracking; for example, some projects had inconsistent contact information (missing phones numbers and e-mails). The Evaluation Team also found that, though the project workbooks were very thorough, some documentation appeared to be missing or difficult to find in SPECTRUM. In these cases, the Evaluation Team followed up with the Program Implementer to locate missing information.

Program Materials

For the materials review, the Evaluation Team examined:

- All Issued RFPs
- Project Applications (Template and Completed Customer Workbooks)
- Documents Identifying Renewable-Energy Project Selection or Scoring Methodologies

The Program Administer has not developed a stand-alone Program implementation manual or documented Program operational procedures. The Program follows operational procedures for customer projects specified in the Business Incentive and Large Energy Users Program manuals.

Marketing and Outreach

The Program Implementer primarily targets marketing and outreach activities to Trade Allies; the Program does little direct customer outreach. The Program Administrator solicits proposals through the RFPs, which it posts on the Focus on Energy website.

Outreach to Trade Allies

Focus on Energy relies on the Trade Allies to act as the main liaisons between customers and the Program, informing customers about the program and helping them complete project proposals. The Administrator and Implementers provide Trade Allies with the following outreach activities and marketing materials:

- Trade Ally newsletter
- Direct outreach to Trade Allies over the phone

[98] The Program Implementer only verifies savings figures when the installed equipment differs from that specified in the application.

- Pre-bid webinars and/or a conference call to explain the RFP process and answer applicant questions
- FAQs periodically published on the website

According to an Energy Advisor, when Focus on Energy issued the first RFP in CY 2012, the Energy Advisors contacted Trade Allies to make sure they understood the competitive bid process.

The Evaluation Team interviewed six Trade Allies. Three Trade Allies said they learned about the Program via e-mail from Focus on Energy representatives, and two said they learned about it through previous Program participation. One Trade Ally learned about the Program on the Focus on Energy website while searching for Wisconsin renewable-energy incentive opportunities. All six Trade Allies said they preferred to stay informed about the Program through e-mail from Focus on Energy.

Outreach to Customers

Although the Program's outreach strategy focuses primarily on Trade Allies, Energy Advisors did post information about renewable-energy opportunities in the customer newsletter. Some Energy Advisors said they also provided the RFP to customers who expressed interest in the Program. Customers can also attend the pre-bid webinars and conference calls and have access to the FAQs posted on the website. The Program Implementer does not believe additional customer outreach is needed, since the Program has received strong responses to all three RFPs.

The Evaluation Team interviewed seven customers. When asked how they learned about the Program, some said:

- Through previous participation in a Focus on Energy Program (three respondents)
- Through a contractor or vendor (two respondents)

Customers also said they heard about the Program through utility representatives, the Focus on Energy website, or through word-of-mouth. All seven respondents said they preferred to stay informed about the Program and other Focus on Energy opportunities by receiving e-mails from Focus on Energy.

When asked how they promoted the Program to customers, Trade Allies said they notified specific customers they thought would benefit directly from the Program. Although a few customers may have had prior knowledge of the Program, Trade Allies said most customers they spoke to were unaware of the Program before they informed them. Three of the six Trade Allies reported that their customers were "not too aware" of the Program. Similarly, one Trade Ally thought his customers were "very aware" of the Program, but he thought this was only because he or someone from the company had informed them.

Program Satisfaction

This section provides an overview of customer and Trade Ally satisfaction with the overall Program and individual components.

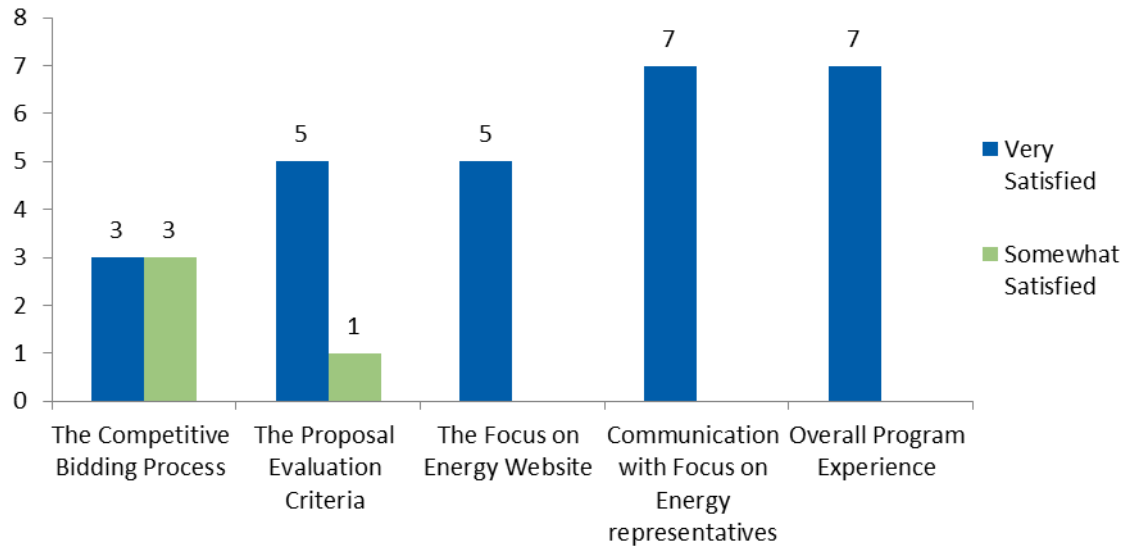
Customer Satisfaction

The Evaluation Team asked customers to rate their satisfaction with the following Program elements:

- Overall Program experience
- Communication with Focus on Energy representatives
- The Focus on Energy website
- The competitive bidding process
- The proposal evaluation criteria

Figure 212 shows the number of customers and their level of satisfaction for each Program element. All seven of the interviewed customers said they were "very satisfied" with their overall experience with the Program and communication from Focus on Energy.

Figure 212. Customer Satisfaction Ratings



Source: Renewable Energy Competitive Incentive Program Customer Interview Guide E1. "Please tell me if you are very satisfied, somewhat satisfied, not too satisfied, or not at all satisfied with the following Program areas…" (n=7)

Customers described their Focus on Energy representatives as responsive, helpful, and proactive. One biomass customer who had to request an extension, said the representative got back to her within one hour and that the representative was "wonderful" and easy to work with through the extension process. However, another customer noted difficulty getting in touch with Focus on Energy representatives before the Program awarded the project, but said that once the proposal was accepted, communication was easier and staff responded more quickly.

Five customers reported using the Focus on Energy website and all five said they were "very satisfied" with the website. Customers said the website was "easy to navigate" and "user friendly," and they liked the tabs separating residential and business programs.

Most customers reported that the proposal evaluation criteria were clear, with five customers stating that they were "very satisfied" with the criteria. These customers also said they thought the proposal scoring was objective, but that their Trade Allies managed most of the proposal details.

Although customers were "very satisfied" with most Program elements, they gave the following reasons for reporting lower satisfaction with the competitive bidding process:

- **Complicated proposal requirements**: One small business customer said that proposal development required extensive technical knowledge and that smaller businesses, without technical expertise or the capital to hire Trade Allies for proposal development, may have difficulty participating.
- **Delays in award notification:** One customer described challenges caused by a delay in the official award documentation after notification of proposal acceptance. According to this customer, after project approval in CY 2012, an Energy Advisor informed him that Focus on Energy did not have documentation prepared for approval. The delay in approval meant this customer was unable to qualify for the CY 2012 federal tax credits he had planned to claim.

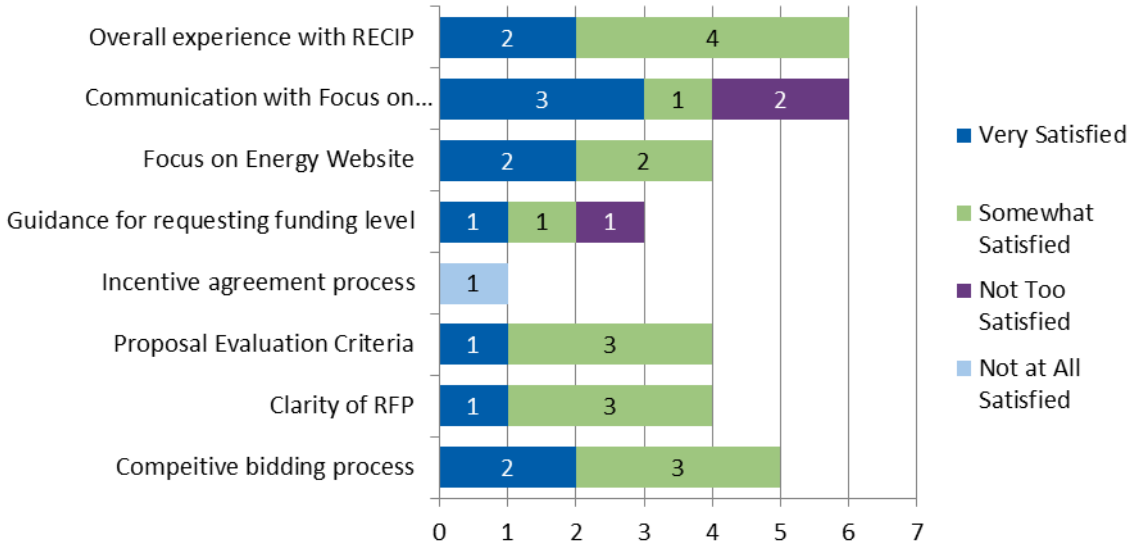
Trade Ally Satisfaction

The Evaluation Team asked Trade Allies to rate their satisfaction with the following Program elements:

- Overall Program experience
- Communication with Focus on Energy representatives
- Focus on Energy website
- Competitive bidding process
- RFP clarity
- Proposal evaluation criteria
- Incentive agreement process
- Guidance for requesting funding level

Overall, Trade Allies reported lower Program satisfaction than did customers. Figure 213 shows Trade Allies' satisfaction levels with each Program element. Two Trade Allies said they were "very satisfied" with their overall Program experience, and the remaining four said they were only "somewhat satisfied."

Figure 213. Trade Ally Satisfaction Ratings



Source: Trade Ally Interview Guide E1. "Please tell me if you are very satisfied, somewhat satisfied, not too satisfied, or not at all satisfied with the following Program areas…" (n=6; figure excludes respondents who answered "Don't Know" or "Not Applicable").

Trade Allies provided the most feedback in the areas of communication and the competitive bidding process.

Communication with Focus on Energy Representatives

The Trade Allies had different experience with their communication with Focus on Energy. Three Trade Allies said they were "very satisfied." They described representatives as helpful and appreciated that Focus on Energy posted FAQs on the website. One Trade Ally, however, said he was "somewhat satisfied," and two said they were "not too satisfied" with Focus on Energy communications. They provided the following feedback:

- Trade Allies said communication with Focus on Energy representatives about proposal requirements was "a little bit slow" and they disliked having to e-mail Focus on Energy representatives instead of calling to ask questions about the proposal. One Trade Ally reported waiting two or three days for responses from Focus on Energy, which held up proposal progress during the short proposal time period.
- One Trade Ally, who reported being "not too satisfied" with Focus on Energy communication, said that he gave this rating instead of "not at all satisfied" because representatives' responsiveness improved between the February 2013 and October 2013 bidding periods.

Satisfaction with the Competitive Bidding Process

Half of the Trade Allies were less than "very satisfied" with the competitive bidding process; they provided the following feedback about their experiences:

- **Complicated proposal requirements.** Several Trade Allies said they had difficulty understanding Program requirements because they changed with every RFP. Specifically, they said it was difficult to determine eligible project costs, incentive levels, and return-on-investment calculations and inputs. However, another Trade Ally who was "not too satisfied" with the guidance for requesting a funding level, said that determining the incentive amount was more straightforward in the October 2013 bidding cycle, when applicants requested incentives based on energy production, than in the February 2013 bidding cycle when Focus on Energy reviewers calculated incentives for applicants.
- **Short proposal development timelines.** Trade Allies said that one month was not enough time to develop complex project proposals and that they had to put other projects on hold and rush to complete proposals within the timeline. They also said that short proposal timelines may favor those customers already planning projects. As one Trade Ally said, "Sometimes timing is so short that it doesn't work. If you're not familiar with the grant and don't have a project ready to go … [you] have to be planning on it in advance."
- **Funding uncertainty.** One Trade Ally described the competitive bidding process as potentially "a lot of up-front work without the return," since the Program did not guarantee project funding. Additionally, Trade Allies said they do not know in advance if or when the Program Administrator will release RFPs.
- **Lack of transparency around incentive allocation**. Two Trade Allies (solar providers, one of whom also installs geothermal projects) did not understand how Focus on Energy allocated incentives between Group 1 and Group 2 technologies and said the technology selection lacked transparency.
- **Technology cost-effectiveness calculations.** Two solar providers also believed that Focus on Energy's solar technology incentive allocation cost-effectiveness calculations may be inaccurate. These Trade Allies mentioned that solar has lower lifetime maintenance costs than do biogas or biomass projects, but they did not see these lower costs reflected in Focus on Energy's cost-effectiveness calculations. One of these Trade Allies also thought that Focus on Energy used a solar cost per energy output value that was too high for the cost-effectiveness calculations.
- **Incentive agreement delays.** One Trade Ally said he was "not at all satisfied" with the incentive agreement process because it took up to three weeks after project approval for Focus on Energy to send incentive agreements to customers.

Customer Experience

The Evaluation Team interviewed seven customers about their experiences with the Program. This section provides findings on customer decision-making, challenges, and suggested Program improvements

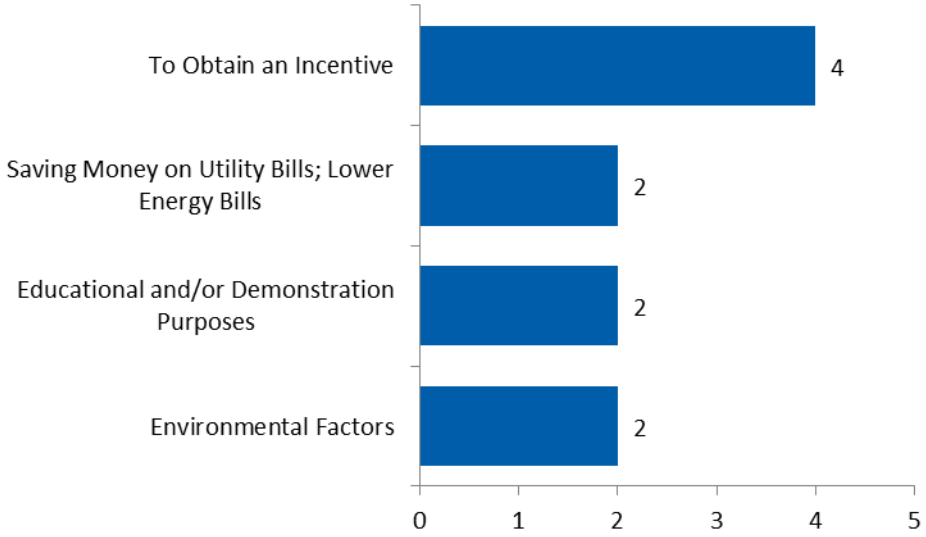
Customer Decision-Making and Influences:

The Evaluation Team asked participating customers about which factors most influenced their decision to submit a proposal to the Program and to install a renewable-energy project, as well what benefits they perceived, beyond energy savings, from the project's installation.

Factors in Decision-Making

Four out of seven customers said the Program incentive was one of the most important factors in their organization's decision to submit a proposal and install a renewable-energy project (see Figure 214). Customers also said they installed projects for environmental or educational reasons and to save money on utility bills, but that they needed the financial incentive to offset a portion of initial costs to make the projects economically feasible.

Figure 214. Most Important Factors in Customers' Decisions to Install a Renewable-Energy Project



Source: Customer Interview Guide C1. "What were the most important factors in your organization's decision to submit a proposal to Focus on Energy's Renewable Energy Competitive Incentive Program and install your renewable energy project?" (n=7; multiple responses allowed)

Perceived Renewable-Energy Project Benefits

In addition to energy savings and reduced energy bills, customers reported they received the following non-energy benefits from their renewable-energy projects:

- **Promotion of a positive corporate/organization image**. One customer's organization promoted its renewable-energy project to the building's tenants, who appreciated renting in a building that uses sustainable energy. Another customer's organization used its solar project as a marketing tool to promote its being a "green" business.
- **Improved community relations.** A biomass customer formed connections and built relationships with people interested in visiting and learning more about the renewable-energy project. A

biogas customer said that installing an anaerobic digester demonstrated her dairy farm's environmental commitment to the community and improved community relations.

- **Use as an educational tool.** A school-district customer used a solar project extensively as an educational tool. The school district incorporated the solar-energy and solar-project design into school curriculum and used the project to educate both students and school district stakeholders about renewable energy and energy efficiency.
- **Use of waste products as fuel.** Some customers were able to use waste products such as manure (from dairy farms) and dead trees (from local emerald ash borer beetle infestation control) as fuel for renewable-energy installations.
- **Production of usable byproducts.** A biogas customer used solid by-products from an anaerobic digester as livestock bedding, providing a use for these by-products and reducing the company's operational costs.

Customer Barriers

The Evaluation Team asked customers about their challenges to installing renewable-energy projects. Customers described three main challenges:

- **Financial investment.** Customers explained that they lacked capital to cover initial costs related to purchasing and installing renewable energy equipment
- **Project siting.** Two participants said they had difficulty finding a suitable project site due to site geography and concerns about vandalism.
- **Project permitting.** One biogas customer reported difficulty in obtaining necessary Department of Natural Resources permits, which delayed the project.

Opportunities for Program Improvement

When asked how Focus on Energy could improve the Program for customers, three customers said the process was straightforward and that nothing needed improvement. The remaining customers offered the following suggestions:

- **Give proposal feedback.** One customer—whose project was initially rejected, but later awarded an incentive when another customer decided not to accept their award—wanted Focus on Energy to provide more transparency about the project selection process. Specifically, this customer suggested providing feedback to customers about how their project scored and how they could improve future proposals.
- **Allow online proposal submission**. One customer wanted to submit proposals only via e-mail instead of submitting both hard copies and digital copies.

Trade Ally Experience

The Evaluation Team interviewed six Trade Allies involved with biogas, biomass, geothermal, and solar projects awarded through the Program. This section provides findings about Trade Ally involvement with

customers, participation benefits, satisfaction, perceived effectiveness of the Program, and suggested Program improvements.

Trade Ally Involvement

In addition to project installation, Trade Allies worked with customers in several ways. All of the Trade Allies said they informed customers about Program opportunities, three said they helped customers determine which type of renewable-energy project to install, five reported developing project proposals, and four reported that they completed the post-installation paperwork.

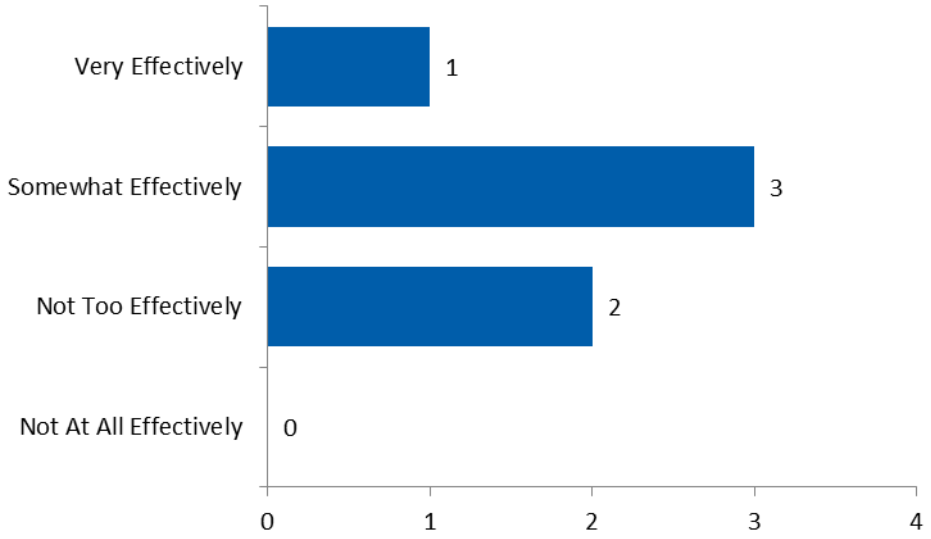
Trade Ally Participation Benefits

Most Trade Allies reported the incentives are the Program's greatest benefit. They said that the incentives make renewable-energy projects economically feasible for customers so that customers can proceed with projects. One Trade Ally also said the Program helped raise customers' renewable-energy awareness. By providing money to overcome capital costs and encourage more customers to install projects, he said Trade Allies could showcase the Program-funded projects and demonstrate to other customers the renewable-energy projects' benefits and feasibility.

Trade Ally Perceptions of Program Effectiveness

The Trade Allies gave mixed ratings about the extent to which the Program encouraged customers to install renewable-energy projects, as Figure 215 shows.

Figure 215. Program Effectiveness in Encouraging Installation of Renewable Energy Projects



Source: Trade Ally Interview Guide D7. "Overall, how effectively do you think RECIP is helping to encourage customers to install renewable energy projects? Would you say…" (n=6).

Trade Allies who thought the Program "somewhat effectively" or "very effectively" encouraged customers to install renewable-energy projects provided positive feedback about the Program including:

- The incentive money encouraged customers to invest their own capital to complete renewable-energy projects.
- The Program involved less paperwork than federal renewable-energy incentive programs.

However, two Trade Allies said that the legacy program did a better job of encouraging customers to install solar projects because the process was simpler and guaranteed funding for eligible projects. Two Trade Allies said they thought the Program was less than "very effective" because customers were not very aware of it. As one Trade Ally said, "I don't think the message is getting out."

One Trade Ally (a solar provider), who participated in both CY 2013 bid cycles, said the Program was "not too effectively" encouraging customers because it incented projects that would have gone forward without incentive funding. According to this Trade Ally, the proposal scoring criteria favored projects with lower project costs that required less incentive money. As he said, "[The Program] looks for good candidates based on the cheapest installed capacity with lowest need for funding to go forward… [they're] basically just giving free money [to those customers] that would do it anyway rather than favoring projects that would not go ahead." However, this comment is contrary to the responses from customers who said that they would not have been able to install renewable-energy projects without financial assistance from Focus on Energy.

Opportunities for Program Improvement

The Evaluation Team asked Trade Allies how Focus on Energy could improve the Program. Trade Allies provided the following suggestions for Program improvement:

- **Increase time between RFP release and proposal deadline.** Trade Allies requested between 45 days and six months to develop project proposals.
- **Ensure responsive communication from Focus on Energy representatives**. Given proposal requirement complexity and the short timeframe in which to develop proposals, Trade Allies requested that Focus on Energy representatives respond more rapidly to their questions throughout the bidding process.
- **Provide more transparency about incentive allocation**. One Trade Ally (a solar provider) requested more transparency and detailed information about the cost-effectiveness calculations which Focus on Energy used to determine the distribution of funding between Group 1 and Group 2 technologies
- **Review incentive allocation calculations**. Another solar provider requested that Focus on Energy and the PSC review the cost-effectiveness calculations in the next quadrennial cycle and use a larger sample of projects to determine inputs.
- **Offer renewable-energy funding on a first–come, first-served basis instead of through the competitive bidding processes.** Several Trade Allies said they preferred the legacy renewable-

energy program because the standard application forms were simpler, less time intensive, and easier to sell to customers because eligible projects were guaranteed funding. These Trade Allies wanted the Program to offer prescriptive and/or custom incentives for renewable-energy projects.

- **Increase outreach and marketing to customers.** Trade Allies said the Program would be more effective if more customers knew about it. They suggested that Focus on Energy reach out more directly to customers.

One Trade Ally, who worked on a biogas project awarded through the CY 2012 bidding cycle, thought the CY 2012 evaluation criteria were less applicable to biogas projects than to other eligible technologies. She said that most biogas projects did not qualify under the CY 2012 RFP because they have high project costs; she referenced a $5 million biogas project that Focus on Energy disqualified in CY 2012 because of its high project costs. She suggested that Focus on Energy raise maximum eligible project costs to more accurately reflect the costs of large biogas projects. [99]

Based on the document review, the Evaluation Team determined that Focus on Energy had already addressed this situation in the CY 2013 RFPs, which raised the biogas and biomass projects' total maximum costs from $2 million to $5 million.

Key Program Processes

The Administrator, Implementer, and system installer deliver the renewable-technology projects according to the Business Incentive and the Large Energy Users Programs' custom program path requirements. The Program Implementer compiles and reviews the required project documentation and workbook and then issues an incentive agreement before the customer can install the project. The Program Implementer inspects all complete projects that receive incentives higher than $25,000.

Program Cost-Effectiveness

Evaluators commonly use cost-effectiveness tests to compare the benefits and costs of a demand-side management program. The benefit/cost (B/C) test used in Wisconsin is a modified version of the total resource cost (TRC) test. Appendix I includes a description of the TRC test.

Table 279 lists the CY 2013 incentive costs for the Program.

Table 279. Renewable Energy Competitive Incentive Program Incentive Costs

Incentive Costs	CY 2013
Business Incentives Program	$665,736
Large Energy Users Program	$270,008
Total Incentives	**$935,744**

[99] The Program Administrator reported addressing this issue beginning in the 2013 RFP cycle.

The Evaluation Team found the CY 2013 Program to not be cost-effective (a TRC benefit/cost ratio above 1). Table 280 lists the evaluated costs and benefits.

Table 280. Renewable Energy Competitive Incentive Program Costs and Benefits

Cost and Benefit Category	CY 2013
Costs	
Administration Costs	$32,647
Delivery Costs	$133,310
Incremental Measure Costs	$2,870,888
Total Non-Incentive Costs	$3,036,845
Benefits	
Electric Benefits	$660,127
Gas Benefits	$550,136
Emissions Benefits	$225,546
Total TRC Benefits	$1,435,809
Net TRC Benefits	**($1,601,036)**
TRC B/C Ratio	**0.47**

Evaluation Outcomes and Recommendations

Renewable Energy Competitive Incentive Program records show 22 complete projects since the Program's CY 2012 launch.[100] The Program achieved high levels of customer satisfaction. Both customers and Trade Allies indicated that the Program helped customers fund renewable-energy projects that they could not afford without the incentives.

The Evaluation Team identified the following outcomes and recommendations to improve the Program.

Outcome 1. Applicants need more proposal development time.

Trade Allies said that the Program's complex proposal requirements made it hard to complete project proposals within the RFP timeframe and that they sometimes had to put other projects on hold to rush to complete proposals. They also said that the short proposal timelines might favor customers who were already planning projects, although the Evaluation Team found no evidence that this happened in CY2013. Trade Allies would prefer at least two months to complete these complicated proposals.

Recommendation 1. Increase the competitive bid proposal timeline to between 45 and 60 days.

- Trade Allies did not want to put their projects on hold or rush to complete projects within the proposal timeline. Providing more time to complete proposals could improve Trade Ally satisfaction with the Program.

[100] Total includes projects completed during the study period and does not reflect funded projects that are not complete.

Outcome 2. Overall, customers were very satisfied with the Program. However, Trade Allies reported some challenges understanding the proposal requirements and receiving clarification from Focus on Energy, resulting in lower satisfaction.

Trade Allies said that they had difficulty understanding proposal requirements because they changed with each RFP. They indicated they would benefit from more timely communication from Focus on Energy regarding their proposal questions so they could complete proposals within the timeline.

Recommendation 2. The Project Administrator reports that the messaging has improved and that consistency exists in information between recent RFPs. Since customers continue to report confusion, the Program should consider:

- Designating an Energy Advisor to respond to applicant questions about the competitive bid.
- Providing additional information on the website, sponsor multiple seminars, expand FAQs, and/or post pre-bid webinars or conference calls on the Program website for applicants who are unable to attend.

Outcome 3. Customers, Trade Allies, and Implementer staff are concerned that the Program Administrator's decision-making and project selection process is not sufficiently transparent.

Customers, Trade Allies, and Implementer staff explained that they wanted more feedback regarding proposal selection. One customer—whose project was initially rejected, but later awarded an incentive when another customer decided not to accept their award—wanted to know why his project was not initially selected and how he could improve future proposals. A few Trade Allies also expressed concern over transparency regarding the distribution of funding between Group 1 and Group 2 technologies, and believed that the cost-effectiveness calculations Focus on Energy used to determine this distribution may be inaccurate.

Recommendation 3. The Project Administrator reports that the messaging has been improved and that transparency exists in recent RFPs. Since customers continue to report confusion, the Program should consider:

- Providing additional feedback to Energy Advisors, Trade Allies, and customers about project scoring and selection.
- Providing more information about how the Program stakeholders determine cost-effectiveness calculations for determining incentive allocations across Group 1 and Group 2 technologies.
- Reviewing cost-effectiveness calculations and update inputs in the next quadrennial cycle.

Outcome 4. To reduce uncertainty regarding timing of project completion, the Program Administrator implemented a committed incentive reduction (up to 25%) in the October, 2013 RFP for projects not completed by their proposed completion date.

Although applicants were not required to commit to a reduced incentive for completing projects after their proposed deadline, they received up to 10 additional proposal points for committing to funding

reductions. Since these projects were not selected until November 2013, the Evaluation Team could not assess the impact of this RFP change for the 2013 evaluation.

Recommendation 4. In the CY 2014 evaluation, the Evaluation Team should explore what impacts, if any, the committed incentive reductions have on project completion as well as customer and Trade Ally experience and satisfaction with the Program.

Outcome 5. Application of the ASHRAE calculation of baseline energy consumption for one new construction project provided an unrealistic savings estimates.

The ASHRAE baseline energy-consumption calculation for new construction stipulates that applicants estimate baseline energy savings using the same fuel type as the proposed measure. In one instance, the ASHRAE methodology stipulated that an electric ground source heat pump replace an equivalent electric resistance heat system, despite the availability of natural gas at the site (a far less expensive form of energy). Although the energy savings provided at the time of application were generally accurate, electricity, thermal, and demand savings were not reflective of the *most likely* scenario, resulting in overestimation of electricity and demand savings.

Recommendation 5. Program staff should consider providing baseline assumptions for new construction projects seeking incentives for ground-source heat pump, biomass, and solar thermal projects, all of which rely partly on historical consumption and occupancy data to accurately predict energy savings.

Outcome 6. Estimates of demand savings for solar photovoltaic projects were inconsistent throughout project documentation.

Applicants can roughly estimate demand savings based on installed capacity and can greatly improve their estimates with the addition of utility, tilt, and orientation data. Applicants could provide reasonable projections for demand savings and these figures could easily be verified by the Program Administrator or Implementer during project review. This would provide greater insight into potential benefits of the proposed system.

Given that the Evaluation Team identified variations in accuracy of demand savings calculations between the Business Incentive and Large Energy Users Programs, the Evaluation Team recommends that the Program Administrator and Implementers review results across programs to ensure a consistent calculation method. Program Implementers are aware of this issue and taking steps to ensure consistency in future Program years.

Recommendation 6. Provide guidance to Program applicants for calculating demands savings at the time of application. Focus on Energy could supply a simple multiplier based on average system characteristics or a more detailed calculation procedure to produce project-specific results.

Outcome 7. In some cases, verified installed capacities of solar photovoltaic systems differed from the capacities the Evaluation Team found in the application materials.

The Evaluation Team found that total installed capacity of a solar photovoltaic system under the Program was 5% greater than the total capacity claimed in the applications. Updating project information in the database following project completion would yield more accurate assessment of Program realization rates as well as energy and demand predictions.

Recommendation 7. Ensure that Program Implementers update the SPECTRUM database to reflect installed system characteristics—panel type, capacity, tilt/orientation—following project completion and, if applicable, system inspection. Further, notify applicable members of the Evaluation Team of any changes to the database to ensure that evaluation results accurately reflect the installed system.

Outcome 8. Program Implementers indicated that it was difficult in some cases to upload program documents in a consistent manner due to variations in file sizes and formats.

Recommendation 8. The Evaluation Team recommends that the Implementation Team review the SPECTRUM database and make modifications necessary to facilitate reliable and efficient uploading of project data.