

REPORT

Focus on Energy
Calendar Year 2012 Evaluation Report
Volume II

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Residential Segment Program Findings

The residential segment encompasses single-family and multifamily housing. The CY 2012 Evaluation reviewed nine residential segment Mass Market programs:

- Multifamily Energy Savings Program (including the Direct Install component)
- Express Energy Efficiency Program
- Appliance Recycling Program
- Home Heating Assistance Program
- Residential Lighting and Appliance Program
- Home Performance with ENERGY STAR® Program
- New Homes Program
- Residential Rewards Program
- Assisted Home Performance with ENERGY STAR Program

The 2012 Focus on Energy residential evaluation was designed to:

- Measure the 2012 residential Segment energy and demand savings, specifically, the gross and net energy and demand impacts;
- 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 Evaluation Team conducted both an impact evaluation and a process evaluation of the Multifamily Energy Savings Program and the Multifamily Direct Install Program. The total ex post verified gross savings for all multifamily programs in CY 2012 are 10,568,525 kWh and 707,953 therms. The Multifamily Energy Savings Program ex post verified gross savings for CY 2012 are 6,514,463 kWh and 443,394 therms. The Multifamily Direct Install Program ex post verified gross savings for CY 2012 are 4,054,062 kWh and 264,559 therms.

M&V Approach

These were the key questions that directed the Evaluation Team's design of the M&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? What are other barriers specific to this Program and Segment?
- How is the Program leveraging the current supply chain for Program 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 the activities listed in Table 1 to obtain multiple perspectives in the assessment of the Program's CY 2012 performance. Since the programs are delivered separately (but are marketed together), the Evaluation Team treated the programs independently for each activity listed.

Table 1. Research Activities For Multifamily Energy Savings Program And Multifamily Direct Install Program

Activity	Description	Evaluation Area	Completed Sample Size (n)
Stakeholder Interviews[1]	Insights into design and delivery. Process-related issues, including barriers to initial participation and to adopting Program recommendations	Process	3
Participating Building Owner/Manager Interviews	Program satisfaction and participation decisions	Process	10
Participating Contractor Interviews[2]	Program satisfaction, participation decisions, and challenges faced	Process	6
Nonparticipating Contractor Interviews[3]	Program awareness and participation decisions	Process	5
Materials Review	Completeness and alignment with industry best practices	Process	N/A
Participating Building Owner/ Manager Net-to-gross Survey[4]	Direct Install and prescriptive/custom freeridership and spillover	Impact	44
Engineering Reviews	Review of measure level savings and assumptions	Impact	N/A

[1] Stakeholders interviewed were the Program Administrator's Program Manager and residential segment Manager, and the Program Implementer's Program Manager.
[2] Participating contractors were defined as contractors who may or may not have been registered Trade Allies but who participated in the Multifamily Energy Savings Program in CY 2012. All six interviewed contractors were registered Trade Allies.
[3] Nonparticipating contractors were defined as contractors who were not registered Trade Allies and did not participate in the Program in CY 2012.
[4] Participating building owners/managers were defined as customers who owned or managed a multifamily building with four or more units that were either sub-metered or individually metered. Nineteen surveys were conducted with Multifamily Direct Install Participants and 25 with Multifamily Energy Savings Program participants.

Impact Evaluation

The overarching questions addressed in this section are these:

- What are the verified gross electric and gas savings?
- What are the verified net electric and gas savings?

The evaluation activities that informed the impact findings were database reviews, engineering reviews, and self-reported net-to-gross analyses. Table 2 shows the realization rates for the 2012 calendar year for Multifamily Energy Savings Program. As there were some "carryover"[1] measures for this program,

[1] "Carryover" measures were tracked in the Multifamily Energy Savings Program SPECTRUM database, but the records are from Apartment and Condo Efficiency Services (ACES) applications. Records were identified as "carryover" if the application name contained "ACES."

the realization rates are shown for the new program, the carryover program, and the two programs combined.

Table 2. Multifamily Energy Savings Program Realization Rate

Realization Rate (Current Program Only)	Realization Rate (Carryover Program Only)	Realization Rate (Both Programs)
98%	101%	99%

Table 3 shows the realization rate for the 2012 calendar year for the Multifamily Direct Install Program.

Table 3. Multifamily Direct Install Program Realization Rate

Realization Rate
116%

Tracking Database Review

The Evaluation Team reviewed the database to determine which variables should be tracked in SPECTRUM to enable precise engineering reviews of the deemed savings. The Team found that most of the data for supporting engineering reviews of the rebated measures either exist only on photocopied application forms—or do not exist at all. Manually entering data from PDFs is inefficient; the Evaluation Team strongly suggests that SPECTRUM track specific measure information electronically.

Gross and Verified Gross Savings Analysis

To evaluate the verified gross electric savings and gas savings for both programs, the Evaluation Team reviewed both the Multifamily Energy Savings Program and Multifamily Direct Install Program database and conducted engineering reviews of measures contributing the most energy savings. The Team chose measures for engineering reviews that were either projected to contribute the largest savings over the quadrennial or were high savings measures in 2012, as identified in the tracking database. The Evaluation Team plans to report all engineering review results (including measures not examined this year) in the CY 2013 Evaluation Report.

Although the results reported in the CY 2012 Evaluation Report do not include the adjustments from the engineering reviews, the Evaluation Team used deemed assumptions and algorithms—in combination with program data—to verify the measure-level savings. Some measures received the same unit energy savings as reported; however, some measures received updates to the verified unit energy savings. Those changes are explained in the following sections for each program.

Multifamily Energy Savings Program

The Multifamily Energy Savings Program measures that resulted in updated unit-verified savings were these:

- Hot Water, Condensing, >=90% AFUE, 300-1000 MBH
- Boiler, Hot Water, Modulating, >=90% AFUE, ≤300 MBH
- Boiler Tune-Up

For the two boiler equipment measures, the Evaluation Team used information about actual climate zones, boiler sizes, and boiler efficiencies in accordance with the Focus on Energy deemed savings review documents. However, the values reported in the tracking database only used size to calculate savings and assumed state-wide climate zone and efficiencies. Note that for the boiler installations, the high savings amounts were the result of having the actual AFUE (efficiency) values that were higher in the tracked data than in the original deemed estimates. The opposite is true for the Boiler Tune-Up program, which actually had lower efficiency improvements than was originally assumed in the deemed savings reviews.

Multifamily Direct Install Program

The direct install measures that resulted in updated verified savings were:

- Showerhead, Direct Install, 1.5 gpm (electric)
- Showerhead, Direct Install, 1.5 gpm (natural gas)

The deemed savings algorithms for showerheads were based on the assumed that the efficient showerhead would have a 1.75 gallons-per-minute rating; however, the showerheads installed under the program were actually rated at 1.5gpm. This change in gallons-per-minute resulted in an increase of the unit energy savings.

Treatment of Carryover Program Data

Carryover program savings derive from applications submitted under the guidelines and program requirements for the Apartment and Condo Efficiency Services Program, which ended in March 2012, but approved for payment after the Multifamily Energy Savings Program launched in April 2012. Thus, the Evaluation Team applied the evaluated realization rates from two previous programs (Apartment and Condo Efficiency Services (ACES) New Construction and ACES Whole Building) to the reported savings. Table 4 lists the realization rates for each carryover measure.

Table 4. Multifamily Energy Savings Program Carryover Realization Rates

Measure Name	Realization Rate (MMBTU)
Building Envelope, Not Otherwise Specified	101%
LED, Not Otherwise Specified	100%
Lighting, Not Otherwise Specified	100%
Solar Thermal, 9 - 32 collectors, >2500 therm/year, nonprofit, efficiency first	100%

Gross and Verified Gross Savings

Table 5 lists the total gross savings and verified gross savings for Multifamily Energy Savings Program achieved in CY 2012. Carryover program savings are broken out for Multifamily Energy Savings Program only. There were no carryover savings for Multifamily Direct Install Program.

Table 5. Multifamily Energy Savings Program Gross Savings Summary

		Gross			Verified Gross		
		kWh	KW	Therms	kWh	KW	Therms
Current Program	Annual	3,226,395	434	229,454	3,193,158	430	223,346
	Lifecycle	32,558,508	434	3,317,184	32,295,616	430	3,488,907
Carryover Program	Annual	3,302,147	755	217,451	3,321,305	742	220,048
	Lifecycle	26,413,888	755	1,772,259	26,567,155	742	1,793,042
Total Savings	Annual	6,528,542	1,190	446,904	6,514,463	1,173	443,394
	Lifecycle	58,972,396	1,190	5,089,443	58,862,771	1,173	5,281,949

Table 6 lists the total gross savings and verified gross savings for Multifamily Direct Install Program achieved in CY 2012.

Table 6. Multifamily Direct Install Program Gross Savings Summary

	Gross			Verified Gross		
	kWh	KW	Therms	kWh	KW	Therms
Annual	3,708,358	195	221,255	4,054,062	396	264,559
Lifecycle	30,058,290	195	2,212,551	33,726,603	396	2,645,593

Net-to-Gross Analysis

The Evaluation Team conducted a survey of participating building owners and managers to determine the measure level net-to-gross ratios for both the Multifamily Energy Savings Program and Multifamily Direct Install Program measures. In the participant survey, the Team asked a series of freeridership questions and a series of spillover questions (see Appendix P, B3–B14, C1-C13 and D1-D12 in the customer survey instrument). It is noted that:

- Freeriders are program participants who would have purchased an efficient measure at the same time as the program occurred but without any influence from the program.
- Spillover comes from customers' decisions to invest in additional efficiency measures beyond those rebated through the program.

Table 7 lists the measure-level and program component-level net-to-gross estimates.

Table 7. Multifamily Direct Install Program And Multifamily Energy Savings Program Net-to-Gross Ratios

Program Component	Program Measure	Net-to-Gross Ratio
Multifamily Energy Savings Program-Direct Install	CFL	97%
	Faucet Aerator	98%
	Showerhead	97%
	Overall	97%
Multifamily Energy Savings Program	Overall	66%

For Multifamily Energy Savings Program, the Evaluation Team added or subtracted freerider and spillover amounts to the gross program impact values to derive a net-to-gross ratio at the program level. The sampling for Multifamily Energy Savings Program did not allow for net-to-gross estimates at the measure level.

For Multifamily Direct Install Program, the Evaluation Team added or subtracted freerider and spillover amounts by measure to the gross program impact values by measure, and they are used to derive a net-to-gross ratio for each measure.

Freeridership Methodology

The Evaluation Team developed a score for all participants based on their responses to the freeridership questions. The Team has developed a transparent, straightforward matrix approach to assigning a single score to each participant, based on his or her responses.[2] The Team translated the responses of each participant into a matrix value and then applied a consistent, rules-based calculation to obtain the final freeridership score. This matrix approach provides these key benefits:

- ***The ability to derive a partial freeridership score.*** These scores are based on respondents' estimates of how likely they are to take similar actions in the absence of an incentive. Thus, the analysis can make use of "don't know" and "refused" responses rather than rejecting a data point, which is illustrated in Appendix P.
- ***The ability to change weightings*** to test the sensitivity of responses to a variety of weighting scenarios.

Appendix P shows the conversion of each raw survey response option into freeridership scoring matrix values for the Multifamily Energy Savings Program and Multifamily Direct Install Program.

Appendix P also shows the freeridership score combinations, which the evaluation team used to categorize customer survey responses for the Multifamily Direct Install Program and Multifamily Energy Savings Program.

[2] Khawaja, S. The NAPEE Handbook on DSM Evaluation, 2007 edition, page 5-1.

The Team's process for assigning a freeridership score is as follows:

- Customers were categorized as 0% freeriders if they did not know about a measure before hearing about the program and had no plans to install the measure. Customers were also categorized as 0% freeriders if they knew about the program but had no plans to install a measure.
- Customers were categorized as 100% freeriders if they would have installed the measure without the program or if they had installed the measure before learning about the program.
- Customers received a partial freeridership score if they had plans to install the measure and their decision was influenced by the program. (This influence may have been installation timing, the number of measures installed, or the efficiency levels of measures installed.) For customers who were highly likely to install a measure and for whom the program had less influence over their decision, the Team assigned a higher freeridership percentage.

After translating survey responses into matrix values to determine each participant's freeridership score, The Team calculated the average freerider score for the overall program.

Spillover Methodology

The Evaluation Team measured spillover by asking customers whether, as a result of their Program participation, they decided to install additional efficiency measures or to undertake any additional efficiency-improving activities. The Team then asked customers to report the Program's relative influence on their decisions to pursue these additional savings (questions D1 through D12 of the customer survey, included in Appendix M).

The Team applied deemed savings values to the spillover measures that customers said they installed as a result of their program participation. The Team then calculated the spillover percentage for a measure by taking the sum of additional spillover energy savings reported by participants across the whole program for a given measure and dividing that sum by the total reported gross energy savings achieved by program respondents for that measure (as reported in the customer survey). Formally, this relationship is:

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

Using the following equation, the Team combined this spillover information with the Program-level freeridership results to achieve the net-to-gross ratio:

$$\text{Net-to-Gross} = 1 - \text{Freeridership} + \text{Spillover}$$

Freeridership Findings

The Team surveyed 25 Multifamily Energy Savings Program participating customers regarding 30 measures they installed through the program. As shown in Table 8, the program had an overall freeridership estimate of 35% across all measures, weighted by Program measure gross-verified energy savings.

Table 8. Multifamily Energy Savings Program Freeridership Estimate

Measure Name	n [1]	Freeridership Estimate	Absolute Precision
Overall	30	35%	± 14%

[1] n refers to number of properties accounted for during survey

Table 9 shows the unique response combinations from the Multifamily Energy Savings Program participant survey, the freeridership score assigned to each combination, and the number of responses for each combination. The values in Table 9 do not represent the raw responses to the survey questions, but rather shows whether the raw survey response to the question is indicative of freeridership. Appendix P shows the conversion of each raw survey response option into freeridership scoring matrix values.

Table 9. Frequency Of Multifamily Energy Savings Program Freeridership Scoring Combinations

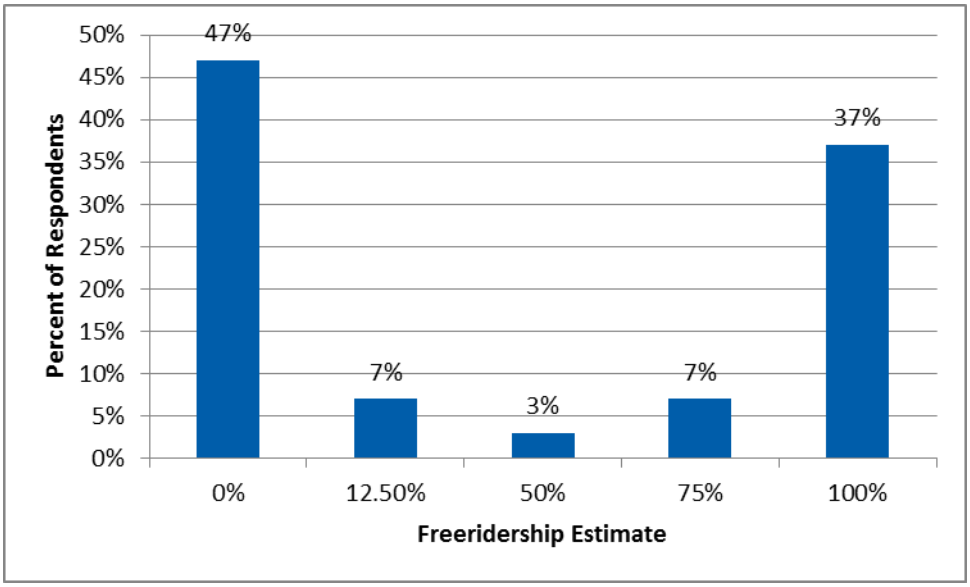
Freeridership Score	Frequency
100%	9
75%	2
50%	1
25%	0
12.5%	2
0%	14

The following patterns commonly occurred in respondents' answers to the Multifamily Energy Savings Program freeridership battery, representing 16 of 27 (59%) program measures surveyed:

- A total of 10 measures were estimated at 0% freeridership, because the respondents associated with these measures said they would not have installed the equipment without the Focus on Energy program.
- Six measures were estimated at 100% freeridership, because the respondents associated with these measures said that in the absence of the program, they would have installed the same measures within the same year. These respondents said the program was not very important in their decision to install the energy-efficient measures.

Figure 1 shows the distribution of freeridership estimates assigned to Multifamily Energy Savings Program responses.

Figure 1. Multifamily Energy Savings Program Freeridership Distribution By Estimate



The Team surveyed 18 Multifamily Direct Install Program participating customers regarding three direct-install measure groups, as shown in Table 10. Overall, the program had an average freeridership of 3% across all respondents, weighted by program measure gross-verified energy savings.

Table 10. Multifamily Direct Install Program Freeridership Estimates

Measure Group Name	n[1]	Freeridership Estimate	Absolute Precision
CFL	18	3%	± 7%
Faucet Aerators	19	2%	± 6%
Showerheads	18	3%	± 10%
Overall	55	3%	± 4%

[1] n refers to number of properties accounted for during survey

Table 11 shows the unique response combinations from the Multifamily Direct Install Program participant survey, the freeridership score assigned to each combination, and the number of responses for each combination. Rather than representing the raw responses to the survey questions, the values in the table show whether the raw survey response to the question is indicative of freeridership. Appendix P shows the conversion of each raw survey response option into freeridership scoring matrix values.

Table 11. Frequency Of Multifamily Direct Install Program Freeridership Scoring Combinations

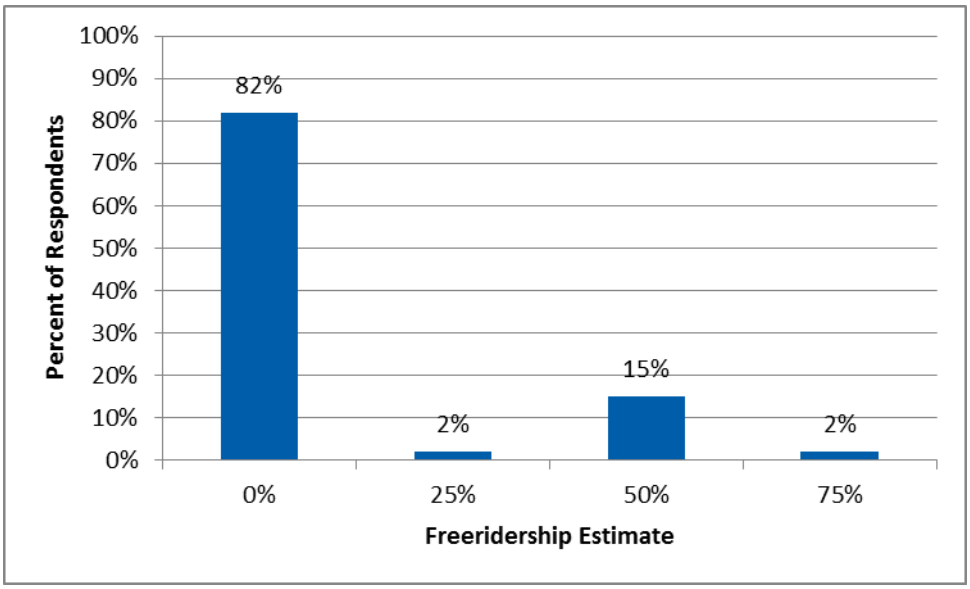
Freeridership Score	Frequency
75%	1
50%	8
25%	1
0%	45

The following patterns commonly occurred in respondents' answers to the freeridership battery, representing 47 of 55 (85%) program measures surveyed:

- 39 measures were estimated at 0% freeridership, because the respondents associated with these measures said they would not have installed the equipment without the Focus on Energy program.
- 8 measures were estimated at 50% freeridership, because the respondents associated with these measures said that in the absence of the program, they would have installed the measures within one to two years. These respondents also said the program was very important in their decision to install the energy-efficient measures, a factor that has a downward effect on the freeridership estimate.

Figure 2 shows the distribution of freeridership estimates assigned to Multifamily Energy Savings Direct Install Program responses.

Figure 2. Multifamily Direct Install Program Freeridership Distribution By Estimate



Spillover Findings

Two surveyed participants in the Multifamily Energy Savings Program attributed additional energy-efficient purchases to their participation in the Program. Table 12 shows the savings values for these two respondents (of 25 total) who, using a scale of 1 to 5 indicated that their participation in the Multifamily Energy Savings Program was "*very influential*" regarding their decision to take additional energy-efficient actions.

Table 12. Multifamily Energy Savings Program Spillover Measures

Measure Name	Quantity	Per-Unit MMBTU Savings[1]	Total MMBTU Savings[1]
T-8 Lighting Upgrades	6	0.39	2
Exterior LED Lighting	20	0.80	16
Total	-	-	18

[1] MMBTU was used to weight the responses across participants with both electric and gas savings.

As shown in Table 13, The Team estimated Multifamily Energy Savings Program spillover as 0.2% of Multifamily Energy Savings Program survey sample program savings.

Table 13. Multifamily Energy Savings Program Spillover Estimate [1]

Spillover MMBTU Savings	Survey Participant MMBTU Savings	Spillover % Estimate
18	8,725	0.2%

[1] CY 2012 evaluated gross energy savings

No participants in the Multifamily Direct Install Program reported spillover savings in CY 2012.

Net-to-Gross Findings

In order to calculate net-to-gross, the Evaluation Team used the following equation to combine the spillover and freeridership results.

Net-to-Gross = 1 – Freeridership + Spillover

This yielded an overall net-to-gross estimate of 66% for the Multifamily Energy Savings Program and 97% for the Multifamily Direct Install Program. Table 14 shows the overall net-to-gross estimate for Multifamily Energy Savings Program.

Table 14. Multifamily Energy Savings Program Freeridership, Spillover, And Net-To-Gross Estimates

	Freeridership (%)	Spillover (%)	Net-to-Gross (%)
Overall Program	35%	0.2%	66%

Table 15 shows the net-to-gross estimates by measure and overall for Multifamily Energy Savings Direct Install Program.

Table 15. Multifamily Energy Savings Direct Install Program Freeridership, Spillover, And Net-To-Gross Estimates

Measure Name	Freeridership (%)	Spillover (%)	Net-to-Gross (%)
CFLs	3%	0%	97%
Faucet Aerators	2%	0%	98%
Showerheads	3%	0%	97%
Overall Program	**3%**	**0%**	**97%**

Treatment of Carryover Program Data

The Evaluation Team applied the net-to-gross ratios from the previous programs (ACES and Multifamily – New Construction Program) to the verified gross savings for each of the carryover measures. Table 16 lists the net-to-gross ratios for each measure.

Table 16. Multifamily Energy Savings Program Carryover Realization Rates

Measure Name	Net-to-Gross (MMBTU)
Building Envelope, Not Otherwise Specified	56%
LED, Not Otherwise Specified	69%
Lighting, Not Otherwise Specified	70%
Solar Thermal, 9 - 32 collectors, >2500 Therms/year, nonprofit, efficiency first	100%

Net Savings

Table 17 lists the total verified net savings achieved for the Multifamily Energy Savings Program achieved in 2012.

Table 17.Multifamily Energy Savings Program Net Savings

		Verified Net		
		kWh	KW	Therms
Current Program	Annual	2,094,145	282	146,475
	Lifecycle	21,180,199	282	2,288,105
Carryover Program	Annual	1,856,492	414	123,640
	Lifecycle	14,848,644	414	1,021,774
Total Savings	Annual	3,950,637	696	270,115
	Lifecycle	36,028,844	696	3,309,878

Table 18 lists the total verified net savings achieved for the Multifamily Direct Install Program achieved in 2012.

Table 18. Multifamily Direct Install Program Net Savings

Verified Net			
	kWh	KW	Therms
Annual	3,932,705	383	257,198
Lifecycle	32,734,204	383	2,571,981

Process Evaluation

The process evaluation for both the Multifamily Energy Savings Program and the Multifamily Direct Install Program addressed these key questions:

- What is the Program process (e.g., how does it deliver services to customers)?
- Are key staff roles clearly defined?
- 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?
- What are other barriers specific to this Program and segment?
- How is the Program leveraging the current supply chain for Program measures and what changes can increase the supply chain's support of the Program?
- What is customer satisfaction with the Program?

Program Design, History, and Goals

The Multifamily Energy Savings Program and the Multifamily Direct Install Program, both of which launched in April 2012, replaced the discontinued Apartment and Condo Efficiency Services Program.

The Multifamily Energy Savings Program has two tracks:

1. A prescriptive track, where customers receive incentives for purchasing energy-efficient equipment for tenant units and common areas; and
2. A custom track for measures that are not eligible for the prescriptive incentives but that provide whole-building savings.

The Multifamily Direct Install Program focuses on installing measures at no cost to end-users within multifamily complex tenant units.

The Program Administrator and Program Implementer designed both programs to mitigate the participation barriers that occurred with the ACES Program. The Program Administrator and Program Implementer also designed the new programs to meet these objectives in CY 2012:

- Lower non-incentive costs by recruiting Trade Allies to assist with marketing and outreach;
- Increase participation by using the Multifamily Direct Install Program to guide participants to the Multifamily Energy Savings Program;
- Limit non-producing energy assessments by increasing the conversion rate from receiving energy assessments to measure implementation; and
- Increase the Multifamily Energy Savings Program options and participation by including offerings such as the custom track with benchmarking.[3]

The Program Administrator reported that both programs have met the first three of these four objectives. However, participation in the benchmarking option within the Multifamily Energy Savings

[3] The custom track within the Multifamily Energy Savings Program allows customers to apply for incentives for projects that are not eligible for the prescriptive track incentives but are designed to boost whole-building energy savings. Benchmarking incentives occur are provided the project obtains higher-than-projected energy savings after an analysis of one year of utility data.

Program's custom track has not increased significantly. The Program Administrator noted that it is too soon to determine the success of the benchmarking option, as it is a new program design.

The Program Implementer said the financial setup for Multifamily Direct Install Program was the main reason that the Program did not meet its savings goals, even though it exceeded its participation goals. Currently, the Program Implementer receives a $100 reimbursement, per housing unit that installs at least one measure. However, tenant/landlord preferences impeded the installation of multiple measures in some units. Those constraints, combined with the fixed annual incentives budget, prevented the Program Implementer from installing a sufficient number of measures in CY 2012 to meet energy and demand savings goals.

Program Implementation and Delivery

The Program Implementer is responsible for these key components of the implementation of both programs: (1) marketing and outreach to customers and Trade Allies, (2) application processing, and (3) data entry. The Program Implementer delivered the Direct Install Program to multifamily complexes, while the Trade Allies played a major role in delivering Multifamily Energy Savings Program by assuming Program marketing duties.

The Program Administrator is responsible for these key components of both programs: (1) providing overall management, (2) approving incentive payments, (3) tracking progress according to contractual goals, and (4) coordinating with other programs.

While the Program Implementer and the Program Administrator describe the delivery process for both programs as effective, they attributed the Multifamily Energy Savings Program's delivery success to two elements that motivated customers to install measures following the energy assessments:

- The custom project engineering calculation fee, a reimbursable deposit customers pay for detailed calculations on energy-savings opportunities for their custom projects, and
- The bonus structure, by which customers received a higher bonus for installing measures earlier in the year and a lower bonus as the year progressed.

Although the Program Implementer reported that the rate of customers progressing from Multifamily Direct Install Program to Multifamily Energy Savings Program was lower than the goal of 40%, the Program Administrator believes there is a six - to 12-month lag and has confidence it will increase over time.

- ***Participating in Multifamily Direct Install Program.*** Interested building owners/managers determine their eligibility by completing the online Eligibility Tool. The Program Implementer then schedules an installation time for eligible owner/managers. During the scheduled appointment, the Program Implementer performs the direct-installation of measures and leaves customer and tenant materials at the site. Following the installation, the Program Implementer records the measures installed in the SPECTRUM database and invoices the Program Administrator for the measure costs.

- ***Participating in Multifamily Energy Savings Program.*** Interested building owners/managers with potential projects contact the Program Implementer to schedule a site assessment or are referred to the Eligibility Tool. Following the assessment, the customer receives a list of recommended energy-efficient upgrades that are available through the Program's prescriptive or custom track. Customers who had paid a deposit to receive the project's energy-savings calculations are provided with the results. After working with a contractor or registered Trade Ally to complete the project, the Trade Ally sends the incentive application and invoice to the Program Implementer. The Program Implementer processes the application and submits it to the Program Administrator for payment.

Market Barriers

The Program Implementer and Program Administrator identified these market barriers to participation for both Programs:

- Split incentive;
- Market saturation;
- Cumbersome paperwork; and
- IRS-required tax ID on applications.

The Program Administrator reported that the biggest market barrier for multifamily programs across the country is the split incentive, which occurs with rental housing properties. The property owners choose not to invest in energy-efficiency upgrades because they will not receive the savings when the tenants pay their own utility bills. Meanwhile, tenants do not make energy improvements because they do not own the property they occupy. The Program Implementer said the increased 2012 prescriptive and custom incentives for the Multifamily Energy Savings Program attempted to overcome this barrier, but they saw little market response to the increased incentives.

The Program Administrator said that the water-saving measures in the Multifamily Direct Install Program may not be affected by the split incentive barrier because most complexes pay for their tenants' water use, and customers like the idea of water-saving measures.

The Program Implementer estimated the direct-install market is 40% saturated[4] because Focus on Energy has offered multifamily programs for many years. Also, other similar programs in the area—weatherization programs or utility-run programs—offer direct-install measures.

The Program Administrator and the Program Implementer plan to target smaller complexes and university housing starting in 2013.

[4] Of the eligible complexes in the state, 40% have already participated, so they may not be eligible to participate again, depending on the level of previous participation.

Since both customers and Trade Allies said the paperwork was cumbersome, the Program Administrator and the Program Implementer agreed that an electronic application would help address this barrier by making the process easier.

The Program Administrator identified another paperwork-related issue: contractors who expect the Programs to involve cumbersome paperwork might be less inclined to participate as Trade Allies.

The Program Implementer reported a final market barrier: the IRS requirement that applicants include their tax ID on their applications. Customers, particularly those for the no-cost Multifamily Direct Install Program, do not want to include this information, either because of the administrative inconvenience of locating the number or because of concerns about providing financial information. The Program Implementer estimated that the tax ID requirement resulted in a loss of at least 1,000 units in CY 2012.

Program Materials

Overall, the Evaluation Team found that the materials promoting the Multifamily Energy Savings Program and Multifamily Direct Install Program contained clear, concise process steps. One notable difference between the program materials is that Multifamily Energy Savings Program has a process flow diagram in the Operations Manual, but there was no similar diagram provided in the original manual for the Multifamily Direct Install Program. Appendix L provides further detail on the Evaluation Team's materials review.

Marketing, Outreach, and Training

Marketing Materials

The Program Implementer followed the marketing plan to create these materials for both programs: fact sheets, leave-behinds for customers, and Website content. The Program Administrator reported that the CY 2012 messaging for both programs appealed to both large and small property owners/managers.

The Program Implementer and the Program Administrator agreed that the most successful marketing tactics were:

- ***For Multifamily Energy Savings Program:*** word-of-mouth, apartment association newsletter articles, and repeat customers.
- ***For Multifamily Direct Install Program:*** coordinating with utilities to send out targeted mailers.

As part of the CY 2012 research, the Evaluation Team spoke with 10 participating property owners/managers. When asked how they learned of both programs, those interviewed gave the following responses:

- Three learned of the programs from other property owners or managers;
- Three learned of the programs through their utility;

- Three could not recall how they became aware of the programs; and
- One declined to respond to the question.

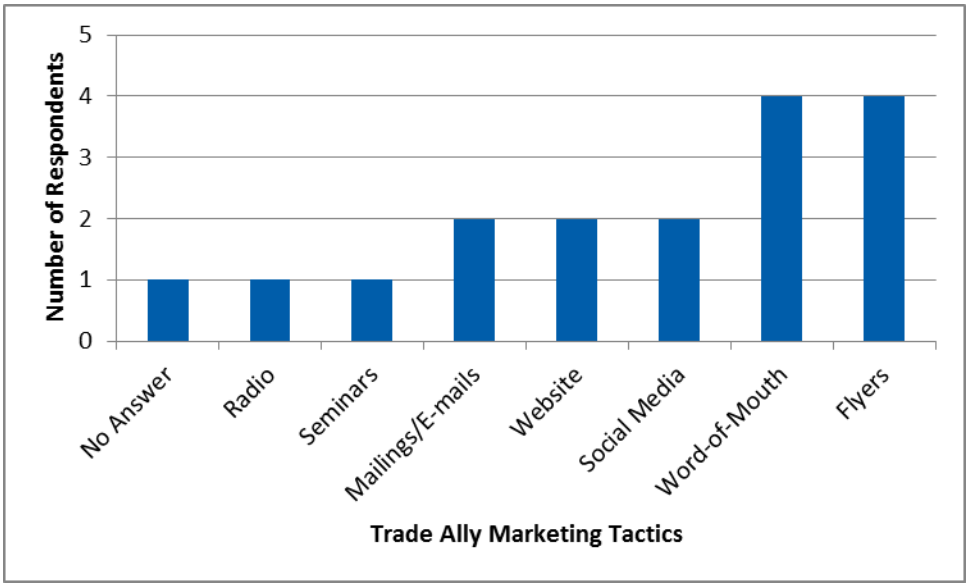
The Evaluation Team also interviewed six participating Trade Allies, who, as participants, are encouraged to market the Multifamily Energy Savings Program.

- Five Trade Allies interviewed said they marketed the Multifamily Energy Savings Program.
- One Trade Ally generally did not market the Multifamily Energy Savings Program, although when customers had a large job, he informed them of the Program.
- Only one Trade Ally also reported marketing the Multifamily Direct Install Program to customers.
- Of the five Trade Allies who marketed the Multifamily Energy Savings Program but not the Multifamily Direct Install Program said: "It takes away work from our plumbers and electricians."[5] Another said, "We don't encourage the Direct Install, but we tell clients to look at the Focus on Energy Website."

None of the participating Trade Allies interviewed used Focus on Energy marketing materials, although three reported knowing these materials were available. When asked what marketing tactics they used with their customers, Trade Allies said they most frequently used word-of-mouth and flyers, as shown in Figure 3.

[5] Several years ago, plumbing and electrical professionals brought an official challenge as to whether direct install measures had to be installed by licensed electricians and plumbers. While the plumbing and electrical professionals lost the challenge, they continue to have some negative feelings about the issue, as evidenced by this Trade Ally's feedback.

Figure 3. Trade Ally Marketing Tactics (N=10)[1]



[1] Multiple responses allowed

Outreach for Trade Allies

The Program Administrator believed that increasing Trade Ally involvement would greatly benefit the Multifamily Energy Savings Program and, therefore, encouraged the Program Implementer to expand Trade Ally outreach for the CY 2012 Program. The Program Implementer's outreach strategies succeeded, and Trade Ally registration increased in CY 2012, particularly during the last quarter. However, the Program Administrator would like to see even greater Trade Ally involvement in CY 2013, both through an increase in the number of registered Trade Allies and through increased engagement of Trade Allies in Multifamily Energy Savings Program marketing.

The Program Implementer used Focus on Energy general Trade Ally materials rather than Multifamily Energy Savings Program-specific materials to recruit Trade Allies. Also, the Program Implementer identified face-to-face outreach with Trade Allies as the most effective tactic, although news articles, trade shows, and e-mail blasts were also effective.

Of the six participating Trade Allies interviewed, most reported hearing about the Programs from Focus on Energy, as shown in Table 19.

Table 19. How Participating Contractors Heard Of The Programs (N=6)

Source	Number of Respondents
Focus on Energy	4
Utility	1
Other: realtor group	1

The Evaluation Team also interviewed five non-participating contractors. When asked how they learned of the Programs, two of the contractors said word-of-mouth, one said Focus on Energy, and two did not recall.

Training for Trade Allies

The Program Implementer and Program Administrator did not offer Program-specific trainings or materials to staff or Trade Allies. Instead, they used Focus on Energy general recruiting materials. The Program Administrator plans to provide program-specific staff training for the Multifamily Energy Savings Program in the future.

The Program Implementer said management company maintenance staff trainings (such as the Building Operator Certification Program) could improve the Multifamily Energy Savings Program. The trainings are offered under the assumption that if property management maintenance staff have a better understanding of multifamily buildings and are better able to identify potential energy efficiency improvements, which could then be completed through the programs.

Customer Response[6]

The Evaluation Team interviewed 10 property owners/managers: five who participated in Multifamily Energy Savings Program and five who participated in Multifamily Direct Install Program. All but one of those interviewed were familiar with both programs.

Responses Regarding the Multifamily Energy Savings Program. The five property owners/managers interviewed about this Program had mixed responses in terms of their overall satisfaction (as shown in Table 20). Three property owners/managers said they would recommend the Program, and two said they would not. The one property owner/manager who described himself as "*not at all satisfied*" said that the timeframe for receiving the rebate was too long and the rebate amount was too low.

Table 20. Satisfaction With The Multifamily Energy Savings Program (N=5)

Satisfaction	Number of Respondents
Very satisfied	2
Somewhat satisfied	2
Not at all satisfied	1

When asked why they decided to participate, most said they wanted to reduce owner costs, as shown in Table 21.

[6] Due to the small sample size, the Evaluation Team has presented anecdotal information on CY 2012 customer response, but will evaluate customer response in greater detail in CY 2013.

Table 21. Motivation To Participate In Multifamily Energy Savings Program (N=5)[1]

Helpfulness of Affiliation	Number of Respondents
To reduce owner operating costs	4
To reduce tenant utility costs	1
Needed to replace equipment anyway	1
No answer	1

[1]Multiple responses allowed

Three said they would have purchased energy-efficient equipment without an incentive. One said, "Rebates can make a difference in the quality of the equipment purchased," and another customer said, "The rebate was an added bonus."[7]

When asked for suggested improvements, the property owners/managers recommended the following:

- Reducing the incentive processing time,
- Clarifying the equipment efficiency requirements, and
- Disseminating Program information earlier in the year.

Responses Regarding the Multifamily Direct Install Program. The five property owners/managers interviewed said they were "*very satisfied*" with the information they received and "*very satisfied*" with the Program as a whole. They all said they would recommend the Program.

When asked why they decided to participate in Multifamily Direct Install Program, most said they wanted to reduce owner and tenant costs, as shown in Table 22.

Table 22. Motivation To Participate In Multifamily Direct Install Program (N=5) [1]

Helpfulness of Affiliation	Number of Respondents
To reduce owner operating costs	5
To reduce tenant utility costs	5
To save electricity	1
Environmental benefit	1

[1] Multiple responses allowed

[7] This anecdotal finding does not affect impact findings on freeridership, which the Evaluation Team assessed in the impact evaluation.

In summary,

- Three Multifamily Direct Install Program participants mentioned receiving positive feedback from their tenants, such as: "*They are starting to have lower electric bills,*" and "*Most tenants loved the measures*."
- One participant has heard two complaints on the water pressure from the showerheads.
- Three said their participation in the Multifamily Direct Install Program has inspired them and their tenants to add more energy-efficient lighting to the complex, such as CFLs and LEDs.[8]

When asked for suggestions on how to improve the Program, the property owners/managers recommended increasing the number of CFLs installed and increasing Multifamily Energy Savings Direct Install Program marketing.

Trade Ally Response[9]

The Evaluation Team interviewed six participating Trade Allies and five nonparticipating contractors. When the Team asked the six Trade Allies why they decided to participate in Multifamily Energy Savings Program, five said they did so to benefit their customers. The remaining Trade Ally said he chose to participate because it created additional business opportunities. All said they were satisfied with their Program participation, as shown in Table 23.

Table 23. Multifamily Energy Savings Program Satisfaction (N=6)

Satisfaction	Number of Respondents
Very satisfied	3
Somewhat satisfied	3

When asked how helpful their affiliation with Focus on Energy was for their business, most Trade Allies said the affiliation did not draw additional business, either because customers did not know of the Multifamily Energy Savings Program before requesting services, or because customers did not say how they learned of the Program.

Although the participating Trade Allies reported high satisfaction with the Program, they also reported these challenges: (1) lengthy paperwork, (2) difficulty locating the appropriate applications on the Website, and (3) difficulty in determining correct rebate amounts.

[8] This anecdotal finding does not affect impact findings on spillover, which the Evaluation Team assessed in the impact evaluation.

[9] Due to the small sample size, the Team is unable to make definitive conclusions about Trade Ally response, but these responses do provide timely feedback on the Program. The Team will conduct a larger Trade Ally survey in CY 2013.

The Trade Allies offered the following suggestions for Program improvement:

- Simplify the Website to make the benefits clearer and the applications easier to find (n=2);
- Reduce the amount of paperwork (n=2);
- Provide information earlier on changes to the Program (n=1);
- Increase advertising for the Program (n=1); and
- Provide Trade Allies with more acknowledgment for their work (n=1).

Of the five nonparticipating contractors, four were aware of the Program. When the Evaluation Team asked the four contractors why they decided not to participate in the Program, they said they had no customer interest and no incentive to participate.

Program Cost Effectiveness

The benefit cost (B/C) test, also known as a cost-effectiveness test, is used to compare the benefits of a demand side management program with the costs of the program. There are several tests used for evaluating energy efficiency cost-effectiveness. The benefit cost test used in Wisconsin is a modified version of the total resource cost (TRC) test. This test is a commonly administered test for evaluating energy efficiency programs. A description of the test can be found in Appendix H.

The CY 2012 Multifamily Energy Savings Program was found by the Evaluation Team to be cost effective (a TRC ratio above 1). Table 24 below provides the Multifamily Energy Savings Programs costs and benefits:

Table 24. Multifamily Energy Savings Programs Costs And Benefits

	Multifamily Energy Savings Program [1]	Multifamily Direct Install
Incentive Costs	$999,068	$342,626
Administrative Costs	$336,178	$106,570
Delivery Costs	$766,636	$243,026
Incremental Measure Costs	$758,209	$1,243,031
Total Non-Incentive Costs	$1,861,023	$1,592,627
Electric Benefits	$2,078,379	$1,549,593
Gas Benefits	$2,791,234	$2,344,801
Emissions Benefits	$1,232,518	$1,146,676
Total TRC Benefits	$6,102,131	$5,041,070
TRC Net Benefits	$4,241,108	$3,448,442
TRC Ratio	3.25	3.17

[1] Includes Carryover

Evaluation Outcomes and Recommendations

Outcome 1. The Multifamily Energy Savings Program exceeded its overall energy-savings goals; however, the Multifamily Direct Install Program fell short of its energy-savings goals, despite

exceeding its participation goal. Both programs were successful in meeting their overall objective of achieving energy savings through direct-install and prescriptive incentives for energy-efficient measures.

However, achieving savings from direct-install measures is essential to Multifamily Direct Install Program, and failure to do so may indicate that the Program structure needs adjustment. The Program Implementer reported being unable to install as many measures as anticipated in each unit due to unique housing situations and tenant/landlord preferences. Because of the set budget, the program may again fall short of meeting energy goals if the Program Implementer is unable to install sufficient measures in each participating unit.

Recommendation 1. Consider modifying the current payment structure for the Multifamily Direct Install Program. Offering more than one payment option—specifically, charging a smaller fee for units where fewer measures are installed—would allow the Program Implementer more flexibility for meeting energy savings goals within the budget. Based on conversations with the Program Administrator and Program Implementer, the Evaluation Team is aware of efforts to improve the process by offering several flat-fee options during CY 2013 (underway). The Program Administrator and Program Implementer should assess the effectiveness of these efforts at meeting energy-savings goals for the Multifamily Direct Install Program in CY 2013.

Outcome 2. The Evaluation Team's review found that the marketing materials were relevant and concise, but there is room for improvement in the Operations Manual. When reviewing the operations manual for both programs, the Team found clear process steps for both programs, but only the Multifamily Energy Savings Program has a process flow diagram in the manual.

Recommendation 2. Update the Programs' Operations Manual by including a process flow diagram for the Multifamily Direct Install Program (underway).

Outcome 3. The absence of Program-specific Trade Ally outreach materials may hinder the Program's ability to build a well-informed network of Trade Allies. The Multifamily Energy Savings Program currently uses general Focus on Energy recruiting materials, which provide neither: Program-specific information on the benefits of participation nor details on Program requirements and expectations.

Recommendation 3. To further increase Trade Ally registration and involvement, develop Trade Ally materials specific to the Multifamily Energy Savings Program, showing Trade Ally requirements and participation benefits. These efforts should coordinate with portfolio-wide Trade Ally outreach activities underway in CY 2013.

Outcome 4. The programs have resulted in high satisfaction from participants, but reported challenges with paperwork could diminish satisfaction among Trade Allies and participants and could impede efficient data tracking. All participating property managers/owners reported high satisfaction with the programs, and most reported positive feedback from their tenants on the measures installed. However, the Program Implementer and Program Administrator also reported receiving feedback from customers and Trade Allies that the paperwork was cumbersome. The Program Implementer and Program

Administrator agreed that an electronic application could help to reduce this complaint and improve the data entry process. Trade Allies also suggested reducing paperwork requirements for Multifamily Energy Savings Program.

Recommendation 4. Provide an online application. An online application would reduce the amount of paperwork required of Trade Allies and customers, improve the efficiency of application processing, and minimize data entry errors.

Outcome 5. Most data to support engineering reviews of the rebated measures exist only on photocopied application forms—or do not exist at all. Manually entering data from PDFs is highly inefficient.

Recommendation 5. **Electronically track specific measure information.** Table 25 outlines the variables that are necessary to evaluate the measure level savings for Multifamily Energy Savings Program and Multifamily Energy Savings Direct Install Program. The Program should collect these variables on applications and store data electronically in SPECTRUM.[10] A list of recommended measures is provided in Table 25 at the end of this chapter.

[10] Recommendations apply only to the listed measures, as the Team will review the remaining measures in the CY 2013 Evaluation Report.

Table 25. Recommended Tracking Variables

Program	Measures	Recommended Variables
Multifamily Energy Savings Program	CFL Fixtures	CFL wattage Numbers of bulbs per fixture Bulb location (interior/exterior, common area/in-unit) Make and model number
	CFLs	CFL Wattage Bulb location (interior/exterior, common area/in-unit) Make and model number
	Clothes Washers	Dryer type (gas/electric) Water heat type (gas/electric) Make and model number
	Dishwashers	Water heat type (gas/electric) Energy factor or kWh/year from Energy Star database Make and model number
	Refrigerators	kWh/year from Energy Star database Make and model number
	Boilers	AFUE Make and model number
	Boiler Tune ups	Pre tune-up efficiency Post tune-up efficiency
Multifamily Direct Install Program	CFLs	CFL wattage Bulb location (room type) Make and model number
	Showerheads	Rated gallons per minute
	Faucet Aerators	Rated gallons per minute

Appliance Recycling Program

The Evaluation Team conducted an impact evaluation and a process evaluation of the Appliance Recycling Program. The ex post verified gross savings for CY 2012 are 9,378,857 kWh.

M&V Approach

These were the key questions that directed the Evaluation Team's design of the M&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? What are other barriers specific to this Program and Segment?
- How is the Program leveraging the current supply chain for Program 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 the activities listed in Table 26 to obtain multiple perspectives in the assessment of the Appliance Recycling Program Program's CY 2012 performance.

Table 26. Appliance Recycling Program CY 2012 Evaluation Activities

Activity	Evaluation Area	Completed Sample Size (n)	Absolute Precision at 90% Confidence	Details
Program Database Review	Impact	N/A	N/A	Reviewed the database to ensure appropriate data are being collected.
Engineering Review and Deemed Savings Algorithms	Impact	N/A	N/A	Reviewed savings input assumptions in the Appliance Recycling Program work paper to determine whether the deemed estimates are appropriate.
Participant Surveys	Impact Process	63 (31 refrigerators, 32 freezers)	±15%	Conducted surveys to gather impact-related data for the net-to-gross ratio and part-use factor. Gathered process-related data regarding possible barriers to Program participation, appliance pick-ups, and behavioral changes in reaction to installed measures, and satisfaction with the Program.
Nonparticipant Surveys	Impact Process	62 (34 refrigerators, 28 freezers)	±15%	Conducted surveys to gather data for the net-to-gross analysis; identify how Program nonparticipants discarded units; assess the reasons for customers' non-participation; and determine barriers to Program participation.
Market Actor Interviews	Impact	20 interviews (10 used appliance dealers & 10 new appliance dealers)	N/A	Interviewed appliance retailers to gather supplementary data that provided additional context for the results of the participant surveys.
In Situ Metering	Impact	30 meters (20 refrigerators, 10 freezers)	±15%	Measured the energy consumption of a sample of Program refrigerators and freezers for use in the multivariate regression model.
Multivariate Regression Model	Impact	N/A	N/A	Estimated the annual unit energy consumption of the average participating refrigerator.
Stakeholder Interviews[1]	Process	2	N/A	Interviewed stakeholders for insights into Program design and delivery.
Program Material Review	Process	N/A	N/A	Assessed whether Program materials are correct, clear, and effective.
Benchmarking Study	Process	N/A	N/A	Compared the Focus on Energy ARP program design and processes to other ARP evaluations

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

Impact Evaluation

This section details the findings of the Appliance Recycling Program impact evaluation.

Program Tracking Database Review

As an initial step in the impact evaluation, the Evaluation Team reviewed the Implementer tracking database for CY 2012 for completeness and data quality. The Team found the tracking database to be thorough and complete. This database is separate from SPECTRUM; however, there are plans to integrate program data in the future. The tracking database contained all of the data fields that are necessary to evaluate the Program. Examples of the fields in the database are these:

- Appliance tracking number
- Customer data
- Date of scheduling and appliance pick-up
- Manufacturer, brand, and model number
- Configuration, size, and age of unit
- Location of the unit in the home prior to recycling
- Use of the unit (primary or secondary)
- Unit annual kWh usage (when the unit was a new appliance)
- Whether the unit was replaced
- Type of refrigerant

Engineering Review

To determine whether the deemed estimates are appropriate, the Evaluation Team assessed Program participation and reviewed savings input assumptions from the Appliance Recycling Program work paper.

Program Participation

Based on the data in the tracking database, the Implementer began picking up and recycling appliances in March 2012. The Program quickly ramped up, peaking in August 2012, with 1,859 total appliances recycled during that month.

Table 27 shows the total number of appliances recycled through the Program in CY 2012.

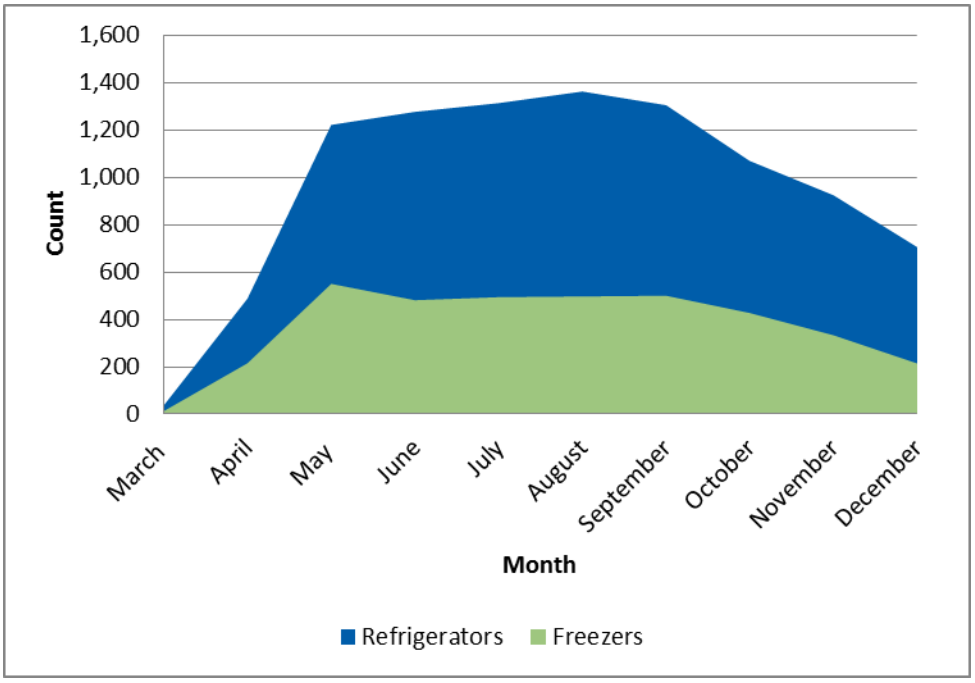
Table 27. Total Appliances Recycled In CY 2012

Appliance Type	2012 Units	Percentage of Total Units
Refrigerator	9,699	72%
Freezer	3,724	28%
Total	13,423	100%

Figure 4 shows the number of appliances recycled by month in CY 2012. For refrigerators, the number of recycled units peaked in August, with 1,362. For freezers, the number of recycled units peaked in May, with 550.

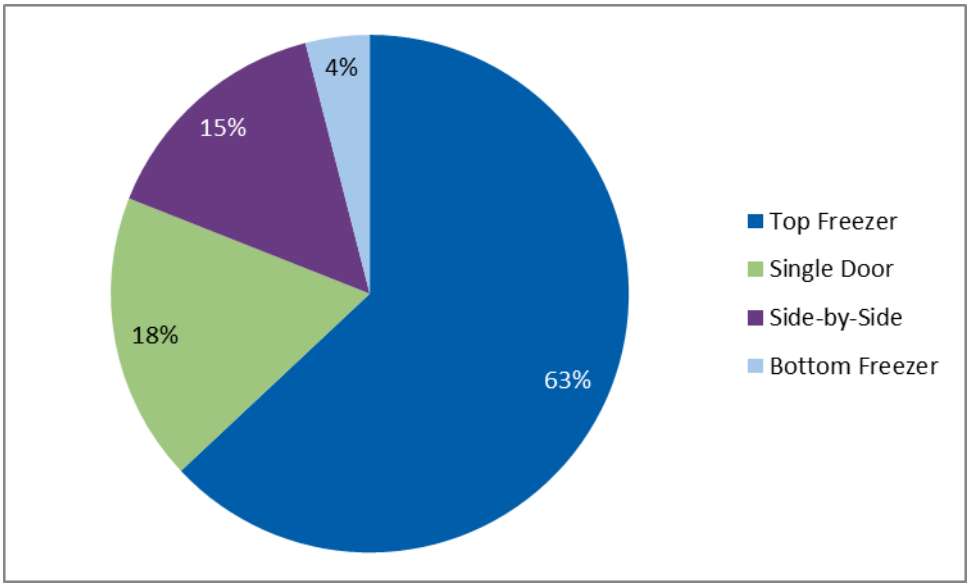
Participation follows the typical seasonal trend observed in other evaluations, with a dramatic increase in spring and a peak in late summer followed by a decline during the holiday season.

Figure 4. Number Of Participating Units By Month



As shown in Figure 5, the majority of refrigerators were top-freezer style (63%). Single-door and bottom freezer configurations are associated with older units, and the relatively high proportion tracks with the high proportion of secondary units recycled through the program in 2012.

Figure 5. Refrigerator Configurations



As shown in Figure 6, the majority of freezers were upright units (56%).

Figure 6. Freezer Configurations

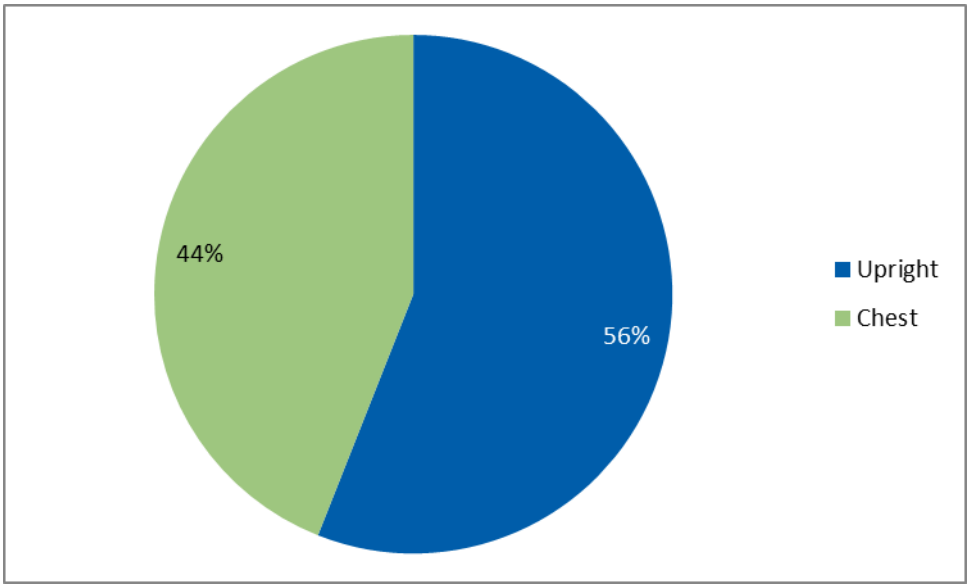


Figure 7 shows the distribution of ages for recycled refrigerators. The average age of a recycled refrigerator was 27.8 years.

Figure 7. Refrigerator Age Distribution

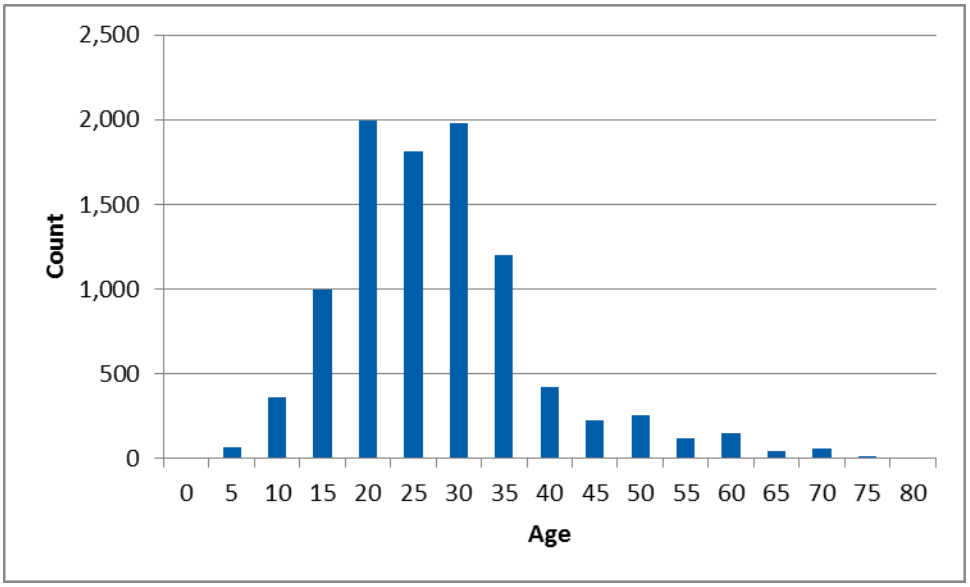
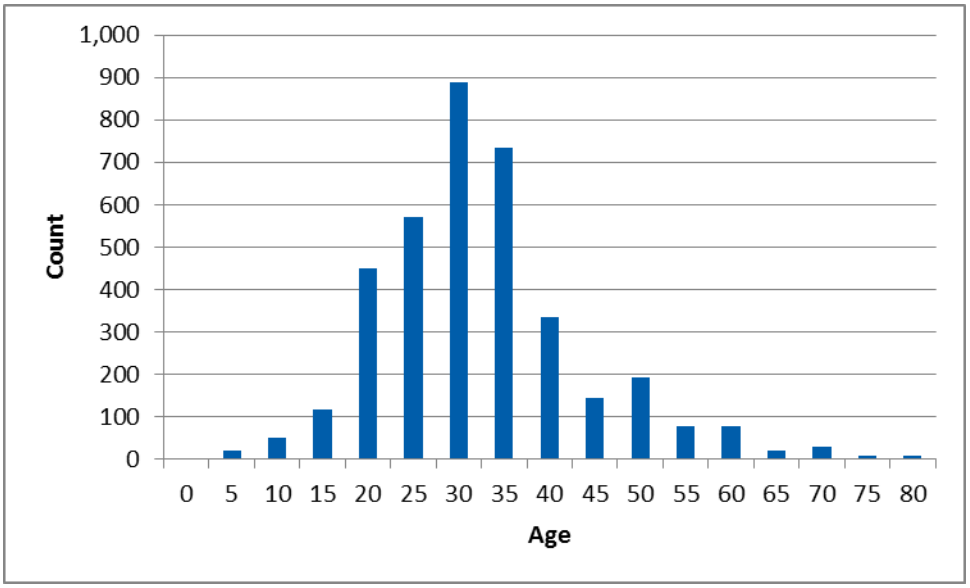


Figure 8 shows the distribution of ages for recycled freezers. The average age of a recycled freezer was 32.8 years. The difference in ages for refrigerators and freezers is typical of appliance recycling programs.

Figure 8. Freezer Age Distribution



Review of Deemed Savings

The Program Implementer used unit energy savings assumptions that were based upon EM&V analyses conducted by Cadmus for Dayton Power and Light (DP&L) for its 2010 program implementation. The DP&L study was used because it is: (1) relatively recent, (2) a Midwest Program, and (3) inclusive of part-

use factors and *in situ* effects. The Wisconsin Appliance Recycling Program's savings assumptions were adjusted to reflect the likely conditions projected for the state between 2012 and 2014.

Table 28 lists the per-unit savings assumptions used for the Appliance Recycling Program in CY 2012.

Table 28. Per-Unit Savings Assumptions For CY 2012

Metric	Refrigerators	Freezers	Basis/Source
Unadjusted gross annual kWh savings/unit	1,190	1,283	Cadmus 2010 EM&V report dated 3/15/2011, page 47. Value includes part-use factors and in situ effects.
Allowance for the passage of time between the 2010 Plan Year and 2012-2014	x 0.9 factor	x 0.9 factor	Equivalent to a 10% reduction; reflects improved average unit efficiency; Program Implementer judgment
Adjusted gross annual kWh savings/unit	= 1,071	= 1,155	Calculated as the product of data in the preceding two rows

The following equation provides the summer coincident peak-savings algorithms used for both refrigerators and freezers.

$$kW_{saved} = (kWh_{saved}/hours/year) * peak\ intensity\ factor = 0.15\ KW/unit$$

Where:

hours/year = 8,760

peak intensity factor = captures increase in compressor cycling time in summer peak conditions relative to average annual conditions (JACO estimate of 30% for Wisconsin conditions) = 1.3

The Evaluation Team modeled energy savings through a multivariate regression analysis using data collected through an appliance metering study conducted for Focus on Energy combined with data from a recent metering study in Michigan. The multivariate regression model provides a more accurate estimate of savings because:

- It takes into account the actual unit energy consumption of a sample of participating appliances; and
- Captures the physical and usage characteristics of the actual population of recycled appliances that drive consumption.

Table 29 lists the savings for both unit energy and peak demand. The Team calculated the unit energy savings from the multivariate regression analysis, discussed further in the section titled "Multivariate Regression Model." The Team calculated peak demand savings using the immediate equation above and the modeled per unit energy savings.

Table 29. Unit Energy And Peak Demand Savings

Measure	Verified Unit Energy Savings (kWh)	Verified Unit Peak Demand Savings (KW)
Refrigerator	675	0.10
Freezer	761	0.11

The unit energy savings were aggregated across the program to produce gross savings values, detailed in the section "Gross and Verified Gross Savings." As listed in Table 30, the evaluation findings for the Appliance Recycling Program resulted in a realization rate of 66% for the Program overall. Because this is the first year of the Program for Focus on Energy, the realization rate is slightly lower than would be expected for a program that had been operating longer.

Table 30. Appliance Recycling Program Realization Rate

Rate	Realization Rate
Refrigerator	65%
Freezer	71%
Total	66%

In Situ Metering Study

The Evaluation Team conducted an *in situ* metering study to gather data on the unit energy consumption of participating refrigerators and freezers. *In situ* metering[11] has become a more common method of evaluating unit consumption since it accounts for variations in environmental and behavioral factors specific to the program being evaluated.

To facilitate metering, the Team contacted customers who were enrolled in the Appliance Recycling Program but whose appliances had not yet been collected for recycling. After using the Implementer SharePoint Website to identify new customers into the Program, the Team contacted the customers before their scheduled pick-up appointments to determine whether they were eligible for the metering study and interested in participating. Working closely with the Implementer management and field staff to coordinate the metering appointments, the Team metered 30 participating appliances (20 refrigerators and 10 freezers) between December 2012 and February 2013.

Each appliance was metered in the participant's home for at least 14 days. Specifically, five meters were installed at each site to measure energy consumption and other usage and environmental factors that impact energy consumption. All meters were set to gather data in five minute intervals, frequent enough to capture data on compressor cycling. In addition to collecting average AC current, meters also recorded internal refrigerator and freezer cabinet temperatures, ambient temperature, and the frequency and duration of door openings.

[11] For this study, *in situ* refers to metering the appliance in the location it currently resides versus in a controlled laboratory setting.

Some types of meter data were not used to assess energy consumption directly. Rather, these data were used to diagnose potential problems encountered in the metering process (thereby increasing the quality of data used in analysis). For example, internal cabinet temperature was used to verify the accuracy of installation and removal times recorded on data collection forms. Ambient room temperature was compared against observed cabinet temperature to ensure that the appliance was operational throughout the metering period.

Table 31 contains a list of the metering equipment used by the Evaluation Team.

Table 31. Metering Equipment Overview

Metering Equipment	Data	Location
HOBO UA-002-64 Temperature Logger	Internal Temperature	Wall of Appliance Cabinet (Interior)
HOBO UX90-005 Light Sensor	Frequency and Duration Door Openings	Ceiling of Refrigerator Cabinet (Interior)
HOBO U12-006 External Data Logger	Current	Side of Appliance (Exterior)
HOBO CTV-A	Current	Top of Appliance (Exterior)[1]
Watts up? Pro ES Power Meter	Energy Consumption	Top of Appliance (Exterior)

[1] Connects to the U12-012 external data logger located on side of appliance.

Metering Data Comparison

The Evaluation Team combined the metering data collected through the study with meter data collected for recent evaluations in Michigan, between 2010 and 2012. For this approach to be valid, the Team tested that the fitted model did not systematically over- or under-estimate savings values for the Focus on Energy appliances. The Team tested for such systematic differences by applying a two-sample t-test to the fitted model's residuals as well as testing for structural changes in the combined model using a Chow test. No significant differences were found between the two samples with p-values of 0.63 and 0.52 respectively.

The Chow test allows for the full developed regression model and tests for structural changes in the relationship between the dependent and independent variables at a specified point, in this case between the Michigan sample and the Wisconsin sample. Again, with p-values of 0.34 and 0.41 for refrigerators and freezers respectively, there were no significant differences found between the samples.

Multivariate Regression Model

The Evaluation Team combined the Michigan and Wisconsin metering data and developed a multivariate regression model to estimate average unit energy consumption (UEC) of retired refrigerators and freezers. To estimate consumption for refrigerators, the Team used the regression model specification in

Uniform Methods Project (UMP).[12] The Team used a similar model developed outside of UMP for freezers.

The coefficient of each independent variable indicates the influence of that variable on daily consumption, if all other variables are constant:

- A positive coefficient indicates an upward influence on consumption.
- A negative coefficient indicates a downward effect on consumption.

The value of the coefficient indicates the marginal impact on the UEC of a one-point increase in the independent variable. (For example, a one-cubic-foot increase in refrigerator size results in a 0.067 kWh increase in daily consumption.)

In the case of dummy variables, the value of the coefficient represents the difference in consumption if the given condition is true. For example, in the model developed for refrigerators, the coefficient for the variable that indicates a refrigerator was a primary unit is 0.32. This means that a primary refrigerator consumes 0.32 kWh per day more than a secondary unit, if all other variables are equal.

Refrigerator Model

Table 32 shows the UMP model specification used by the Evaluation Team to estimate a refrigerator's annual energy consumption and its estimated parameters.

Table 32. Refrigerator UEC Regression Model Estimates (Dependent Variable=Average Daily kWh, R2=0.341)

Independent Variables	Coefficient	Standard Error	p-Value
Intercept	1.36	0.90	0.13
Age (years)	0.03	0.04	0.44
Dummy: Unit manufactured pre 1990s	0.61	0.41	0.14
Size ($ft.^3$)	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

Freezer Model

Table 33 lists the final model specifications used by the Evaluation Team to estimate the energy consumption of participating freezers. (Because UMP only specifies a refrigerator model, the Team created an analogous freezer model.)

[12] Uniform Methods Project, *Refrigerator Recycling Protocol.* 2013.

Table 33. Freezer UEC Regression Model Estimates
(Dependent Variable=Average Daily kWh, R2=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 ($ft.^3$)	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

The Evaluation Team analyzed the corresponding characteristics (the independent variables) for the participating appliances (as reported by Program Implementer in the 2012 program database). Table 34 lists the program averages or proportions for each independent variable. Cooling degree days (CDDs) are the weighted average of CDDs from typical meteorological year 3 (TMY3) data for weather stations mapped to participating appliance ZIP codes.[13]

Table 34. Participant Mean Explanatory Variables

Appliance	Independent Variables	Participant Population Mean Value
Refrigerator	Age (years)	27.78
	Dummy: Manufactured pre 1990s	0.65
	Size (ft.3)	17.36
	Dummy: Single Door	0.18
	Dummy: Side-by-Side	0.15
	Dummy: Primary	0.29
	Interaction: Unconditioned Space x HDDs	13.54
	Interaction: Unconditioned Space x CDDs	0.96
Freezer	Age (years)	32.8
	Dummy: Unit Manufactured Pre-1990	0.83
	Size (ft.3)	16.22
	Dummy: Chest Freezer	0.44
	Interaction: Unconditioned Space x HDDs	20.36
	Interaction: Unconditioned Space x CDDs	1.42

Using the values from Table 32, Table 33, and Table 34, the Evaluation Team estimated the UEC of the average refrigerator and freezer participating in the Appliance Recycling Program. Table 35 shows the average per-unit UEC for 2012 refrigerators and freezers.

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

Table 35. Average UEC By Appliance Type

Appliance	Average Unit Energy Consumption (kWh/Year)	Standard Error	Relative Precision (90% Confidence)
Refrigerator	1,045	119	19%
Freezer	940	151	26%

Part-Use

A part-use factor is a gross energy savings adjustment factor specific to appliance recycling programs. Applied to annual gross savings, this energy savings adjustment accounts for participating refrigerators that were not operating year-round before being recycled. Therefore, a part-use factor is used to convert the UEC into an average per-unit gross savings value.

The participant survey gathered information about pre-program usage patterns and included a question about how appliances would have been operated had they not been recycled. Also from this survey data, the Team estimated how the unit would have been used had it not been recycled through the Appliance Recycling Program.

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. Specifically, 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 outlined in the UMP protocol.

1. Determine whether the recycled refrigerators were primary or secondary units.[14]
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.[15] (Participants who recycled freezers were asked the same question.)

[14] The Team assumed all stand-alone freezers were secondary units.

[15] The Team assumed all primary units were operated year-round.

3. The participants who said they recycled a secondary refrigerator or freezer (or a unit that was operated for only a portion of the preceding year), were asked for an estimate of the total number of months that the appliance was plugged in. For this Appliance Recycling Program, the average number of months specified by this subset of participants was 2.3 for secondary refrigerators and 5.5 for secondary freezers.
4. Divide both values by 12 to calculate the annual part-use factor for all secondary refrigerators and freezers operated for only a portion of the year.

Table 36 lists the part-use factors by category.

Table 36. Part-Use Factor By Category

Usage Type and Part-Use Category	Refrigerators			Freezers		
	Percentage of Recycled Units	Part-Use Factor	Per-Unit Energy Savings (kWh/Yr)	Percentage of Recycled Units	Part-Use Factor	Per-Unit Energy Savings (kWh/Yr)
Secondary Units Only	**n = 22**					
Not in Use	18%	0	0			
Used Part Time	27%	0.19	203			
Used Full Time	55%	1.00	1,045			
Weighted Average	100%	0.60	625			
All Units (Primary & Secondary)	**n = 31**			**n = 32**		
Not in Use	13%	0	0	13%	0	0
Used Part-Time	26%	0.23	239	13%	0.46	431
Used Full-Time	61%	1.00	1,045	75%	1.00	940
Weighted Average	100%	0.67	702	100%	0.81	759

Next, the Evaluation Team asked the participants the likelihood that the appliances would have been operated had they not been recycled through the Appliance Recycling Program. For example, if surveyed participants said they would have kept a primary refrigerator in the absence of the Program, the 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. Those 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.

The Team combined the historically based part-use factors in Table 36 with participants' self-reported actions had the program *not* been available. The results, shown in Table 37, are the distribution of likely future usage scenarios and corresponding part-use estimates. The weighted average of these future

scenarios produces Appliance Recycling Program's 2012 part-use factor for refrigerators (0.65) and freezers (0.81).[16]

Table 37. Part-Use Factors By Appliance Type

Use Prior to Recycling	Likely Use Independent of Recycling	Refrigerators		Freezers	
		Gross Savings Factor	Percentage of Participants	Gross Savings Factor	Percentage of Participants
Primary	Kept (as primary unit)	1.00	0%		
	Kept (as secondary unit)	0.60	0%		
	Discarded	0.67	29%		
Secondary	Kept	0.60	26%	0.81	22%
	Discarded	0.67	45%	0.81	78%
Overall		0.65	100%	0.81	100%

Compared to other recent evaluations, a relatively small number of survey respondents said that their refrigerator had been plugged in and running for the entire year (19 respondents or 61%). Also, a relatively large number of respondents indicated that their unit had not been plugged in at all in the year before the unit was recycled (four respondents or 13%). The latter circumstance is typical for the first program year of an appliance recycling program, as participants tend to recycle older, secondary and unused units when a convenient opportunity occurs for disposing of these units.

The part-use of freezers was more similar to those of other recent evaluations. Fewer respondents used their freezers part time; those who did used their freezer for a greater portion of the year (5.5 months on average) than did the refrigerator respondents (2.3 months on average). Also, a greater number of respondents said they had used their freezer for the entire year (75%) than said they used their refrigerator for the entire year (61%).

Market Actor Interviews

The Evaluation Team interviewed 20 appliance retailers in Wisconsin to obtain supplementary data for use in:

- Assessing the results of the participant surveys;
- Gaining insights into the natural movement of older, operable appliances in Wisconsin; and
- Determining the effects the Focus on Energy Appliance Recycling Program has had on their business.

[16] Since the future usage type of discarded refrigerators is unknown, the Team applied the weighted part-use average of all units (0.67) 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.

These interviews were conducted in January 2013 with 10 retailers of new appliances and 10 retailers of used appliances. This research resulted in important information about market dynamics, which can assist in assessing program net-to-gross, and determining the program's role in the regional marketplace. Table 38 summarizes the results of those interviews.

Table 38. Detailed Profile Of Sales And Services Offered By Home Appliance Market Actors In Wisconsin

Respondent	Question									
	Are you familiar with the Focus on Energy Appliance Recycling Program?	What services does your company offer?	Does your company sell new or used refrigerators and freezers?	How many refrigerator units do you sell on an annual basis?	What percentage is new versus used?	How many freezer units do you sell on an annual basis?	What percentage is new versus used?	Do you accept 'trade-ins' on new and/or used appliance purchases?	Does your company offer pick-up, recycling, or replacement services?	Do you charge a fee for removing an appliance?
1	Yes	Appliance/TV sales; delivery, installation, and service	Both	30-40 units	5% new	NA	NA	With purchase of new	Yes – with purchase	Yes - $25
2	No	Appliance sales	Both	Thousands	99% new	NA	NA	No	Yes	No
3	Yes	New & used appliance sales/service	Both	450 units	75% new	Very few freezers	NA	With purchase of new	Yes	Yes - $25 (free with purchase)
4	No	Home furnishings and appliance sales	Both	50 units	90% new	NA	NA	No	No	NA
5	No	Home appliance service	Both	50-100 units	95% used	A few	95% used	No	Yes	No – not usually
6	Yes	Major appliance sales/ service	Both	195-225 units	60% new; 40% used	About half of that (75 units)	Only a dozen used	With purchase of new	Yes	Yes - $75
7	Yes	Appliance sales/ service	New only	15-20 units	99% new	10 units	99% new	Seldom	Yes – but does not service them	Yes - varies
8	No	Appliance repair and recycling	Used only	47 units	100% used	3 units	100% used	Yes	Yes – with purchase of used	Yes – used to

Respondent	Question									
	Are you familiar with the Focus on Energy Appliance Recycling Program?	What services does your company offer?	Does your company sell new or used refrigerators and freezers?	How many refrigerator units do you sell on an annual basis?	What percentage is new versus used?	How many freezer units do you sell on an annual basis?	What percentage is new versus used?	Do you accept 'trade-ins' on new and/or used appliance purchases?	Does your company offer pick-up, recycling, or replacement services?	Do you charge a fee for removing an appliance?
9	No	Appliance sales and service	Both	135 units	99% new	15 units	99% new	No	Yes – with purchase	No
10	Yes	Home appliance sales/service; delivery	Both	At least 1/3 of sales – 75% refrigerators (Over $1M co.)	Almost all new	At least 1/3 of sales – 25% freezers (Over $1M co.)	Almost all new	No	Yes – with purchase	No - $25 flat delivery fee
11	Yes	Used appliance sales/service	Both	250-300 units	95% used	5% of that (~15 units)	95% used	Yes – with purchase of new	Yes – with purchase	No
12	No	Used appliance sales/service; new furniture sales	Used only	90 units	100% used	10 units	100% used	Yes	Yes	Yes - $20
13	No	Appliance/TV sales; gun sales	Both	NA	NA	NA	NA	Yes	Yes – only for store bought	Yes - $25
14	No	Refrigeration repair and resell; washer/dryer/stove repair and resell	Used only	100	100% used	NA	NA	No - but purchase used appliances	No – but will remove units the store purchases	No
15	No	Used appliance sales	Used only	350	100% used	NA	NA	Yes	No	NA

Respondent	Question									
	Are you familiar with the Focus on Energy Appliance Recycling Program?	What services does your company offer?	Does your company sell new or used refrigerators and freezers?	How many refrigerator units do you sell on an annual basis?	What percentage is new versus used?	How many freezer units do you sell on an annual basis?	What percentage is new versus used?	Do you accept 'trade-ins' on new and/or used appliance purchases ?	Does your company offer pick-up, recycling, or replacement services?	Do you charge a fee for removing an appliance?
16	Yes	Appliance sales, service, install; Comm and Res refrigeration; Res HVAC	New only	40	100% new	NA	NA	No	Yes	Yes - $68.50
17	No	Kitchen/restaurant equipment sales and repair	Both	8	50% new	NA	NA	No	Yes – with purchase of new	Yes - varies
18	No	Retail service	Both	140	85% new	NA	NA	No	Yes	No
19	No	New and refurbished appliance sales	Both	800	88% new	NA	NA	No	Yes – with purchase of new or used	No
20	Yes	Appliance retailer	Both	33	NA	2	NA	No	Yes	Yes - $30

Overall, this research reveals several key findings regarding the role of the Appliance Recycling Program in the regional marketplace:

- A majority of interviewees (12 of 20) were not aware of the Appliance Recycling Program.
- Most retailers interviewed offered appliance pickup services and regarded this service as an industry standard that customers expect (17 out of 20 interviewees offered these services).
- Most interviewees (14 of 20) reported that their business sold both new and used appliances.
  - 2 sold only new appliances;
  - 4 sold only used appliances.
- The number of refrigerators sold by each retailer varied greatly, with seven interviewees reporting they sell fewer than 50 units annually and two retailers reporting sales in the thousands of units.
- The percentage of new and used refrigerators sold by each retailer also varied.
  - 10 said the majority of refrigerators they sell are new.
  - 7 said the majority of refrigerators they sell are used.
  - 1 reported selling about the same quantity of new and used refrigerators.
  - 2 did not answer this question.
- The majority of interviewees (9 of 10) sell fewer freezers annually than refrigerators.

Gross and Verified Gross Savings

Table 39 lists the Appliance Recycling Program's gross savings and verified gross energy impacts (kWh, KW, and therms) for CY 2012.

- Gross savings results are derived from the number of recycled units recorded in the JACO tracking database multiplied by the per-unit deemed energy savings (Table 28).
- Verified gross savings results are derived from the number of recycled units recorded in the Implementer tracking database multiplied by the per-unit energy savings determined through the multivariate regression model (detailed in this section).

Table 39. Appliance Recycling Program Gross Savings Summary

	Gross			Verified Gross		
Savings Type	kWh	KW	Therms	kWh	KW	Therms
Annual	14,139,982	2,228	0	9,378,857	1,404	0
Lifecycle	113,119,859	2,228	0	75,030,856	1,404	0

Net-To-Gross Analysis

The Evaluation Team applied a 0.52 net-to-gross value, as shown in Table 40. This ratio was determined through participant survey responses, and the methodology for the net-to-gross analysis is detailed in the section titled "Determination of Net Savings."

Table 40. Appliance Recycling Program Net-To-Gross Ratio

Net-to-Gross Ratio
52%

Net Savings

Table 41 lists the verified net energy impacts (kWh, KW, and therms) for the Appliance Recycling Program in CY 2012.

Table 41. Appliance Recycling Program Net Savings

Verified Net			
Savings Type	kWh	KW	Therms
Annual	4,877,006	730	0
Lifecycle	39,016,045	730	0

Determination of Net Savings

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 appliance recycling program net-to-gross analysis are these:

- UEC of Replacement Refrigerator;
- Freeridership Induced Replacement;
- Spillover.

The application of the UMP protocol introduced an additional parameter, secondary market impacts, related to net savings. In addition, UMP employs a decision-tree approach to calculate and present net program savings. The decision tree—populated by the responses of surveyed 2012 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 scenarios to calculate the net savings attributable to Focus on Energy's Appliance Recycling Program. Specific portions of the decision tree appear throughout this chapter to highlight specific aspects of the 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 Team's freeridership analysis entailed asking participants if they had considered discarding the participating appliance before they had 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 a non-freeriders.

The 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 their units absent the program. Independent of program intervention, there are three possible scenarios:

1. The discarded unit is transferred to another household;
2. The discarded unit is destroyed; or
3. The unit is kept in the home.

To determine the percentage of participants in each of the three scenarios, the Team surveyed a sample of participants regarding the likely fate of their recycled appliance had it not been decommissioned through the Program.

To ensure the most reliable responses—and to mitigate socially desirable response bias to the greatest extent possible—the Team asked some respondents additional questions. For example, through interviews with market actors in multiple evaluations, the 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 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 Team/s assessment of freeridership. (Using this dynamic, market research-based approach to surveying improves the reliability of the hypothetical self-reported actions of participants.)

After determining the final assessments of participants' actions independent of the Program, the Team calculated the percentages of refrigerators and freezers that would have been kept or discarded (Table 42).

Table 42. Final Distribution Of Kept And Discarded Appliance

Stated Action Absent the Program	Indicative of Freeridership	Refrigerators (n=31)	Freezers (n=32)
Discard	Varies by Discard Method	65%	72%
Kept	No	35%	28%
Total		100%	100%

Secondary Market Impacts

When it is 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 addresses what that potential acquirers might do since that unit was unavailable (because it was recycled through the Appliance Recycling Program). There are three possibilities:

1. ***None of the would-be acquirers would find another unit.*** 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. This position is consistent with prevailing theory and dictates that participating appliances are essentially luxury goods for would-be acquirers. (That is, a secondary refrigerator is not a necessity, but it is nice to have should it be available.)
2. ***All of the would-be acquirers would find another unit***. 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.
3. ***Some of would-be acquirers would find another unit, while others would not***. 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 Focus on Energy-specific information regarding the change in the number of total number of refrigerators and freezers (overall and used appliances both) that were active before and after the implementation of the Appliance Recycling 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.[17]

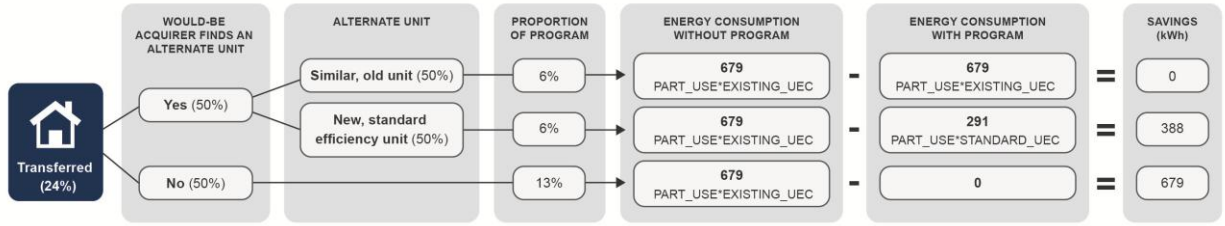
[17] Some evaluators have employed a bottom-up approach that centers on identifying and surveying recent acquirers of non-program used appliances and asking these acquirers what they would have done had the specific used appliance they acquired not been available. While this approach results in quantitative data to support evaluation efforts, the Team does not believe this approach yields reliable results since it is uncertain whether: (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.

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?[18] To determine the energy consumption of a new, standard-efficiency appliance, the 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.

Figure 9 shows the methodology for assessing the Appliance Recycling 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), and
- Partial savings (the difference between the energy consumption of the program unit and the new, standard-efficiency appliance that was acquired instead).

Figure 9. Secondary Market Impacts - Refrigerators

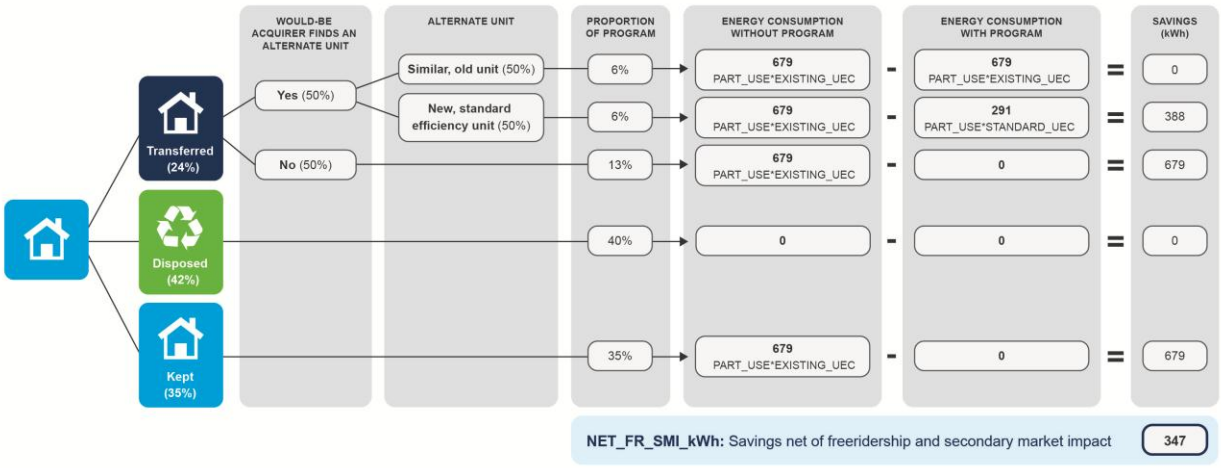


Integration of Freeridership and Secondary Market Impacts

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 10 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 appliance recycling program evaluations.

[18] 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 10. 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). In the case of non-induced replacements, the energy consumption of the replacement appliance is not germane to the savings analysis, since that appliance would have been purchased or acquired regardless of program. It is critical to note that the acquisition of another appliance in conjunction with participation in Appliance Recycling Program does not necessarily indicate induced replacement.

The Evaluation Team relied on information from the participant survey to determine if any of the replacement refrigerators and freezers acquired by Appliance Recycling Program participants were induced by the program. In total, 55% of participants replaced their refrigerators and 38% replaced their freezers. These results indicate that the Appliance Recycling Program both reduced the total number of used appliances operating within the Program's service territory and raised the average efficiency of the active appliance stock.

Next, the Team estimated the proportion of these replacements that were induced by the customer's participation in the Appliance Recycling 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 Team asked a follow-up question. To confirm the participants' assertion that the program alone caused them to replace their appliance, the 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?"

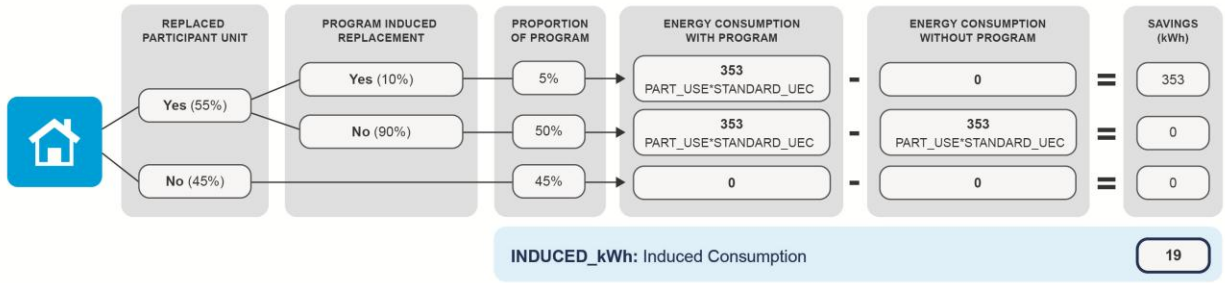
Induced replacement is not solely motivated by a program's incentive. The program's offer to remove the unit from the home (which often requires dealing with stairs) is a major driver of an appliance recycling program's high levels of customer satisfaction. The program's assistance in removing an appliance—which 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 induced replacement analysis also considered these factors:

- Whether the refrigerator was a primary unit; and
- 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 Team's evaluation revealed that only a portion of the total replacements were induced in CY 2012: specifically, 10% of the 17 refrigerator replacements and none of the freezer replacements. Thus, the Program induced only 5% of participants to acquire a replacement refrigerator, as shown in Figure 11.

Figure 11. Induced Replacement - Refrigerators



Using the UMP decision tree net-savings model, the Team determined the final program net-to-gross. The evaluated or ex post net-to-gross represents the weighted average of program-related scenarios. The overall net savings are the result of the following equation and are detailed in Table 46:

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

Spillover

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

The Team applied deemed savings values to the spillover measures that customers said they installed as a result of their Program participation. The Team calculated the spillover percentage for a Program measure type through this approach:

1. Calculating the total of additional spillover energy savings reported by participants across the Program for a given program measure type, and
2. Dividing 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:

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

Table 43 shows the spillover measures that were attributed to the program by survey participants and their associated energy savings.

Table 43. Appliance Recycling Survey Sample Spillover Percentage Estimate

Appliance	Spillover Measure	Spillover Measure(kWh) Savings	Total Spillover (kWh) Savings
Refrigerator	Dishwasher	238	587
Refrigerator	Refrigerator	349	
Freezer	Clothes Washer	323	763
Freezer	Freezer	440	
Total	-	1,350	1,350

Table 44 shows the results of the survey sample spillover analysis.

Table 44. Appliance Recycling Survey Sample Spillover Percentage Estimate

Appliance	Survey Sample Spillover (kWh) Savings	Survey Sample Program (kWh) Savings	Spillover % Estimate
Refrigerator	587	21,059	2.8%
Freezer	763	24,373	3.1%
Total	1,350	45,432	3.0%

To estimate the overall spillover savings, the Team multiplied the spillover estimate for each unit type by the number of participants for the Program year and the per-unit energy savings estimate. (See Table 45.)

Table 45. Appliance Recycling Program Spillover Savings[1]

Appliance	Spillover % Estimate	Units	Per-Unit Energy Savings (MWh/Year)	Appliance Spillover (MWh/Year)
Refrigerator	2.8%	9,699	0.675	181
Freezer	3.1%	3,724	0.761	89
Total	3.0%	13,423		271

[1] From JACO's database.

Table 46 shows the total net savings and final net-to-gross ratio.

Table 46. Total Net Savings and Final Net-to-Gross Ratio[1]

Appliance	Units	Total Program Gross Savings	Freerider and SMI	Induced Consumption	Appliance Spillover	Total Program Net Savings	Net-to-Gross
		MWh/Year					
Refrigerator	9,699	6,544	3,220	184	181	3,363	51%
Freezer	3,724	2,835	1,437	19	89	1,467	52%
Total	13,423	9,379	4,657	203	270	4,830	52%

[1] From JACO's database.

Process Evaluation

The Evaluation Team's Appliance Recycling Program process evaluation addressed these key researchable questions:

- What are the objectives and the process for the Program?
- What are the key roles and responsibilities?
- What are key barriers to participation?
- What has been the Program Implementer's experience with Program processes and implementation?
- Are they adequately prepared to face challenges related to program delivery?
- How can the Program be improved to increase the energy and demand savings cost-effectively?

The Evaluation Team made the following considerations to achieve complete and comprehensive data collection:

- The participant survey asked questions of a random sample of Program participants regarding awareness of Focus on Energy and Program-specific satisfaction and measure verification.
- The nonparticipant survey gathered feedback from a random sample of nonparticipating customers (defined as residents within the Focus on Energy territory who disposed of their unit in the past two years, but not through the Appliance Recycling Program).

- Interviews with stakeholders involved in implementing the Program provided insight into design and delivery and revealed process-related issues such as barriers to participation and overall customer satisfaction.
- The materials review assessed Program materials for completeness and alignment with industry best practices.
- The retailer interviews provided anecdotal insights into retailers' roles within the used appliance and appliance recycling markets.
- Program benchmarking used analysis of similar programs to compare and contrast results.

Program History and Design

The Appliance Recycling Program was launched in March 2012 to provide long-term, cost-effective energy savings for Wisconsin's power grid.[19] This Program is designed to expedite the retirement of old, inefficient appliances, which will result in reduced peak demand and increased annual energy savings.

The Program Administrator was involved with the initial Appliance Recycling Program design and worked with the Program Implementer to finalize both the measure mix and incentive level. The CY 2012 Program offered customers free pick-up and recycling services with a $30 incentive for each refrigerator and freezer recycled (limited to two per customer per calendar year). Through the Program, these appliances were dismantled and recycled in an environmentally responsible manner.

To be eligible for the Program customers must have refrigerators or freezers that are: (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 CY 2012 year-end total for the Appliance Recycling Program was 13,423 units, representing approximately 93% of the 14,400 unit goal. For CY 2013, there are several Program changes:

- The unit goal will increase to 16,000, which the Program Implementer believes is appropriate and achievable.
- In an effort to increase Program participation, the CY 2013 incentive will increase from $30 to $50.

[19] *Focus On Energy Appliance Recycling Program Manual* (Volume 2, page 9) references the Energy Information Administration's 2009 Residential Energy Consumption Survey (RECS). The results of that survey showed that an average of 30% of households in Wisconsin had two or more refrigerators, while 48% of households had one or more separate freezers. See Table HC3.9 data at http://www.eia.gov/consumption/residential/data/2009/#undefined.

- The Program will operate for a full twelve months, unlike the CY 2012 Program, which launched in March.
- The Program will operate in partnership with Sears ® (among other retailers), which will encourage customers who purchase new energy-efficient appliances to sign up at the store to have their old appliances recycled.

Program Delivery and Implementation

The Program Implementer launched and operated the CY 2012 Appliance Recycling Program as designed, with no major changes during the year. According to the Program Administrator, the CY 2012 Program ran very smoothly, and the few challenges encountered were minor.

- The first challenge was related to marketing and branding. From interviews, the Evaluation Team learned that the Program Implementer was not initially aware that Program marketing and branding could not diverge from the Focus on Energy procedures manual. However, after the Program Administrator alerted the Program Implementer of the issue, the latter developed the appropriate marketing materials for the Program. This issue did not delay the Program launch.
- A second minor issue was that the Program Implementer's first few batches of incentive requests contained data errors in mailing addresses for the incentive checks. Most of these errors resulted from customers incorrectly entering their mailing addresses online. To rectify this issue, the Program Implementer instituted ZIP-4 verification software, which automatically verifies all postal addresses. This new software minimizes both customer errors and data errors.

The Program Administrator reports a positive working relationship with the Program Implementer. Also, both the Program Administrator and Program Implementer report their communication to be successful overall, particularly between higher-level staff.

During CY 2012, the Program Implementer used one recycling facility located in Franklin, Wisconsin. While the Program Implementer considered establishing a second recycling facility in Eau Claire or Wausau, neither area had sufficient participation in CY 2012 to justify that. If Program participation increases in CY 2013, it may become feasible for the Program Implementer open a new recycling facility, which would shorten the travel time for long-distance pick-ups, add additional collection trucks, and possibly an additional satellite base collection facility. The average lag time between a customer's call for an appliance pick up to actual collection of the appliance in CY2012 was 12 days. This lag was not a major customer issue in CY 2012, as only 6% of program participants reported that the wait was too long.

Program Materials

The Evaluation Team reviewed the Program materials and concluded that these documents provide clear, comprehensive information about procedures for the Program Implementer and participants.[20]

Marketing, Outreach and Training

The key researchable questions addressed in this section are these:

- What are the barriers to increased customer participation, and how effectively are those barriers being overcome?
- What is customer satisfaction with the Program?
- How do the results compare to those of other similar programs?

Marketing Materials

The various marketing materials and promotional methods used for the Appliance Recycling Program in CY 2012 were these:

- Collateral (Tear Pads)
- Truck Signs
- Direct Mail
- Utility Bill Inserts (noted in the Appliance Recycling Program Manual and Mass Market Program Plan)
- Digital Media (Pay per click, Yahoo.com BT Banners, and Pandora.com)
- Television (15-second and 30-second spots)
- Newspaper (24-inch black-and-white advertisements)

During CY 2012, the Program Implementer submitted all marketing materials to the Program Administrator for approval. The Program Administrator also submitted new marketing materials to the Public Service Commission for its review.

According to the Program Administrator, the Program followed its CY 2012 marketing plan and timeline. The Program Implementer conducted a mid-year marketing plan evaluation and made several adjustments. For example, when participation did not increase in a particular market that had TV advertising, the Program re-allocated marketing dollars to a market where TV advertising increased participation. The Program Implementer also noted instances where newspaper advertisements were canceled in one region in favor of additional TV advertising in that region.

While the Program Administrator and Program Implementer plan to retain most of the marketing strategy and materials for CY 2013, they may also pilot new marketing materials with a different message or imagery. These new materials will be used to experiment with ways to enhance the current

[20] For more information, see the Program Materials Review in Appendix L.

marketing strategy, which has been deemed effective by the Program Administrator and Program Implementer.

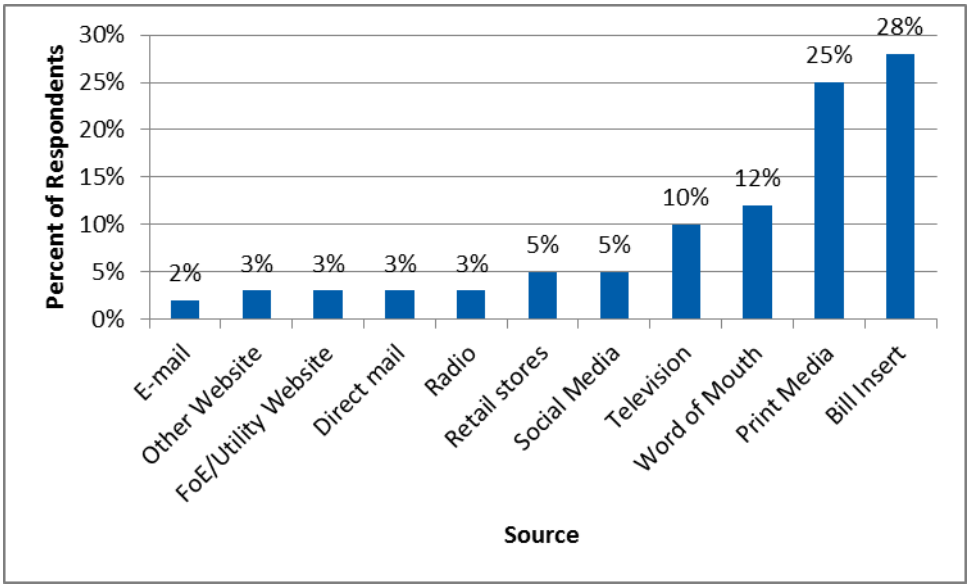
The Program Implementer will also provide more take-one tear-away pads to smaller Wisconsin utilities that cannot afford to use the Program-provided bill inserts. (Using funds from its marketing budget, the Program Implementer creates and prints bill inserts for the various Wisconsin utilities.)

According to the Program Administrator and Program Implementer, the three most effective CY 2012 Program marketing methods (ranked here in order of effectiveness) were these:

1. Utility bill inserts. (Increases in participation corresponded with the timing of bill inserts.)
2. Television ads. (While these were the second most effective Program promotion method, the target audience in certain regions—specifically in Northwest Wisconsin—did not respond well.)
3. Newspaper ads.

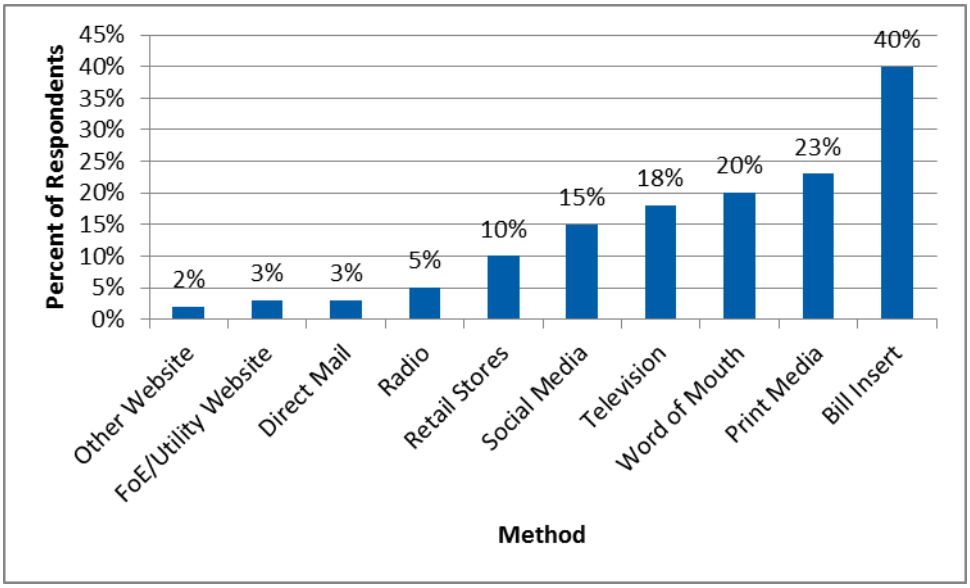
Participant surveys confirmed that bill inserts are a highly effective outreach method; more than half of those surveyed by the Evaluation Team said they learned of the Program primarily through bill inserts and print media (see Figure 12). Participants were approximately as likely to learn about the Program through a friend or colleague (word-of-mouth) as they were to learn about it through TV.

Figure 12. Where Did You Most Recently Learn About The Program?



In addition to participant surveys, the Evaluation Team surveyed 62 customers who disposed of an appliance unit in the past two years, but not with the Appliance Recycling Program. Of those respondents, 50% were aware of Focus on Energy, but only 4% were aware of the Appliance Recycling Program. This implies that general awareness of the Program remains low. As shown in Figure 13, these nonparticipants identified several ways they could be reached with energy-efficiency program information. Their responses are consistent with participant responses, as they prefer to receive information through the mail or through a bill insert.

Figure 13. What Is The Best Way For Focus On Energy To Inform You About Energy-Efficiency Programs?



Outreach

During CY 2012 the Program Implementer collaborated with various organizations to conduct several direct outreach activities. For example, to conduct community-based promotions, the Program Implementer collaborated with ME2 (Milwaukee's energy-efficiency program) and Green Madison (Madison's energy-efficiency program).

In addition, participating customers received information on other Focus on Energy programs. For example, appliance pickup crews gave out pamphlets for other residential programs.

Training

The Program Implementer provides its staff with training and information specific to their implementation roles:

- Call center new hires receive the operator training manual.
- New hires scheduled to work with unit pickup, intake, and/or decommissioning receive the *Refrigerator Collection Handbook*.

The Evaluation Team reviewed both documents and concluded that the materials adequately addressed the following indicators:

- Content is concise and relevant to audience;
- The target customers are identified and the expected benefits are defined;
- Requirements for participation are clearly defined;
- Process steps, responsibilities, and timing are explained;

- Checkpoints and quality assurance (QA) processes are explained; and
- Resources for further help are identified.

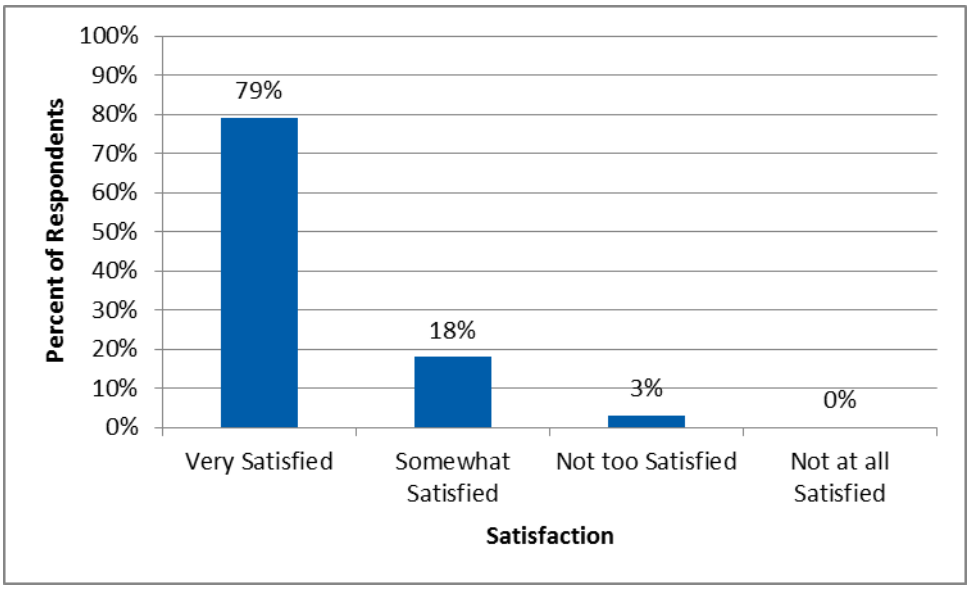
For CY 2012, the Program Implementer did not conduct much hands-on training specific to the Appliance Recycling Program. Most staff members had experience working on similar programs for Midwest utilities, so they required little training. Should training be provided by the Program Implementer in CY 2013 (for example, to retail partners), the Evaluation Team will assess those activities, as well as any updates to the *Refrigerator Collection Handbook* and operating training manual.

Customer Response

Both the Program Administrator and Program Implementer reported that participating customers are very satisfied with the CY 2012 Appliance Recycling Program. From their own data collection efforts, the Program Implementer noted that over 90% of customers were satisfied with their participation in the Program. The Program Implementer also maintains a complaint log, which contains filed complaints but excludes minor issues resolvable by a phone call. The Program Implementer reported that participant complaints were infrequent.

The results of the Evaluation Team's participant survey confirmed that customers were highly satisfied with the Program: 79% of respondents stated they were "very satisfied," and 3% said they were "somewhat satisfied." Additional response data showed that the majority of participants also are satisfied with the rebate processing time (Figure 14).

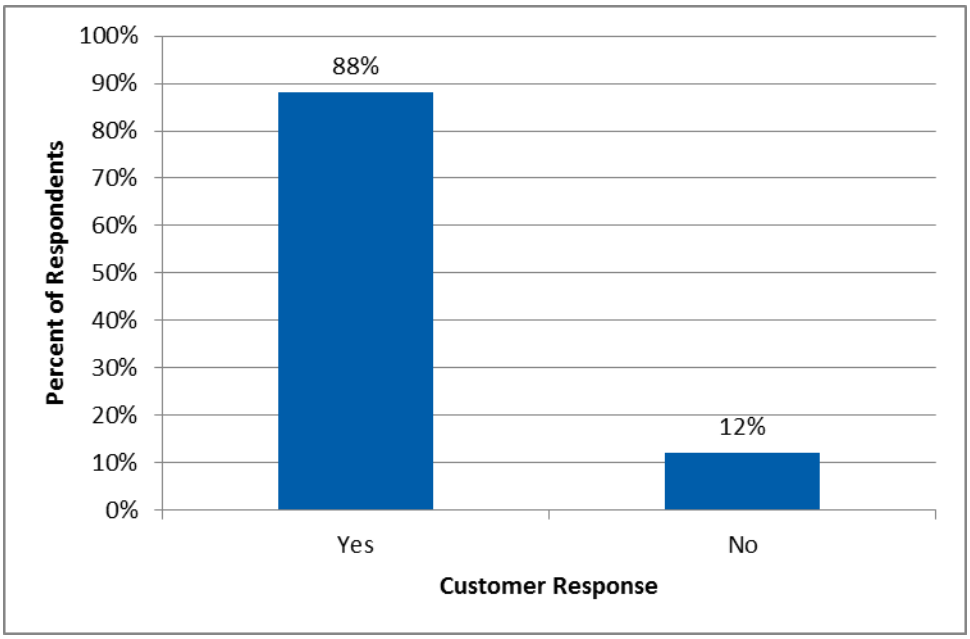
Figure 14. How Satisfied Were You With The Time It Took To Receive Your Incentive?



The Evaluation Team also found that 97% of surveyed participants rated themselves as "very satisfied" with the appliance removal service as a specific component of the Program. In general, the participants were also satisfied with the rebate amount they received, as well as with the disposal services provided.

As Figure 15 shows, 88% of respondents said they would have participated in the Program even if the rebate had been smaller.

Figure 15. Would You Have Participated In The Program If The Amount Of The Rebate Had Been Less?

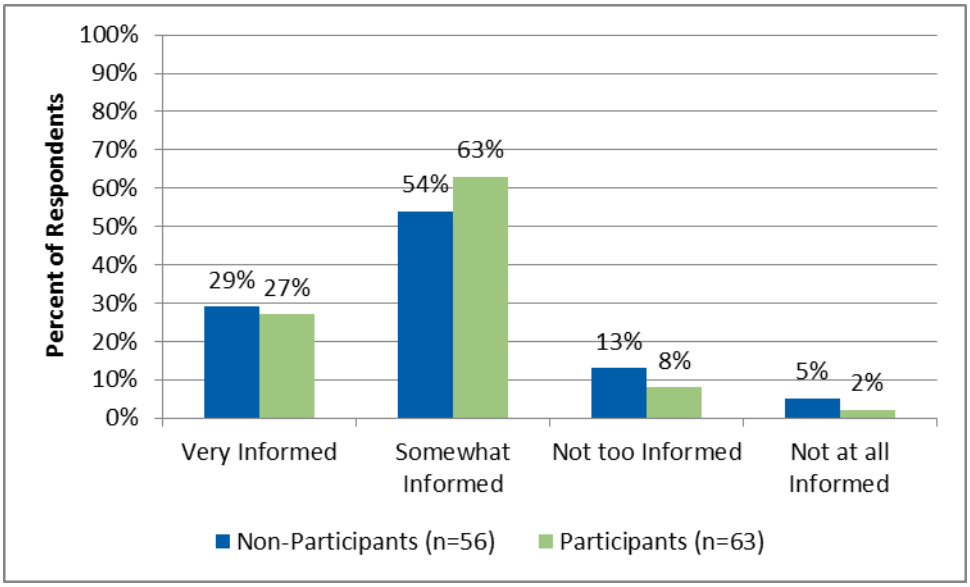


As Figure 16 shows, both Program participants and nonparticipants (residents within the Focus on Energy territory who disposed of their unit in the past two years, but not through the Appliance Recycling Program) felt informed about ways to save energy. However, participants felt more informed than did nonparticipants:

- 90% of participants described themselves as “very informed” or “somewhat informed,”
- 83% of nonparticipants used those categories to describe themselves.

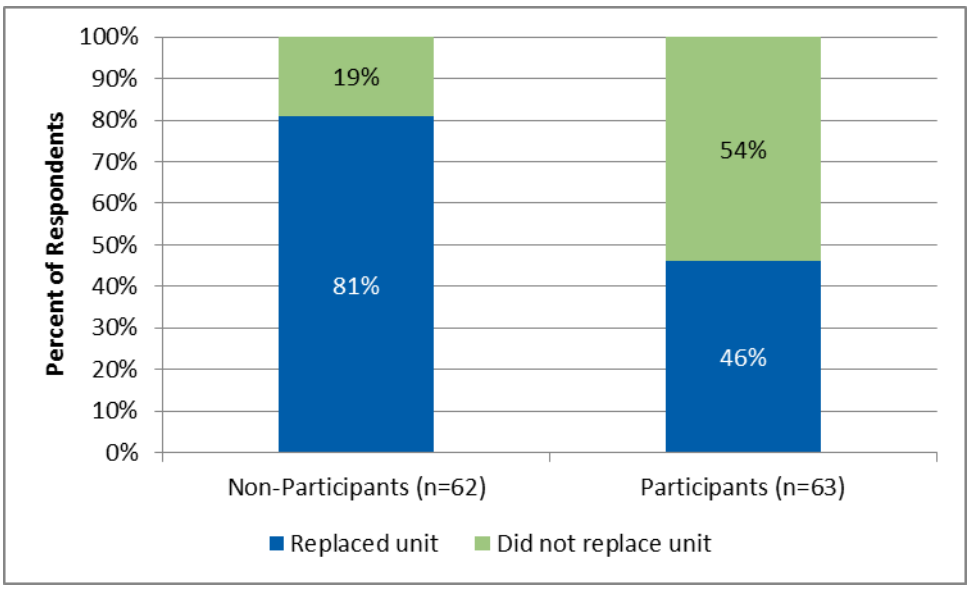
(Note that this comparison between participants and nonparticipants is not statistically significant using a 90% confidence interval.)

Figure 16. How Informed Do You Feel About All The Ways You Can Save Energy?



As Figure 17 shows, nonparticipants (81%) were more likely to replace the unit they removed and/or recycled than participants (46%). This difference is statistically significant.

Figure 17. Did You Replace The Refrigerator/Freezer You Removed?



When asked whether they had purchased an ENERGY STAR product to replace the one that had been removed, both participants and nonparticipants reiterated the importance of saving energy. Among those who replaced the unit they removed, 96% purchased an ENERY STAR model. The percentage of respondents who replaced with an ENERGY STAR model broke down evenly between nonparticipants and participants.

Benchmarking

The Evaluation Team benchmarked the CY 2012 Appliance Recycling Program against similar utility appliance recycling programs. Since the reports for two of three benchmarked utility programs are not publically available, the Evaluation Team cannot reveal specific utility names within this report; thus, these data are cited anonymously under the names “Utility 1” and “Utility 2.” The benchmarked utilities are noted as follows:

- Utility 1, appliance recycling program 2010
- Utility 2, appliance recycling program 2010
- Dayton Power and Light (DP&L) appliance recycling program 2010.

Since Wisconsin has not had an appliance recycling program in many years, the Team benchmarked the CY 2012 Appliance Recycling Program against 2010 programs operating in their first program year. For all four utilities, Figure 18 shows a comparison of the participants who either stated they were "very satisfied" with their respective appliance recycling program or who rated their program at 8 (or higher) out of 10. The Team’s analysis shows that Focus on Energy’s CY 2012 Appliance Recycling Program has overall customer satisfaction levels that are equal to or greater than those of the other three programs.

Figure 18. Overall Program Satisfaction

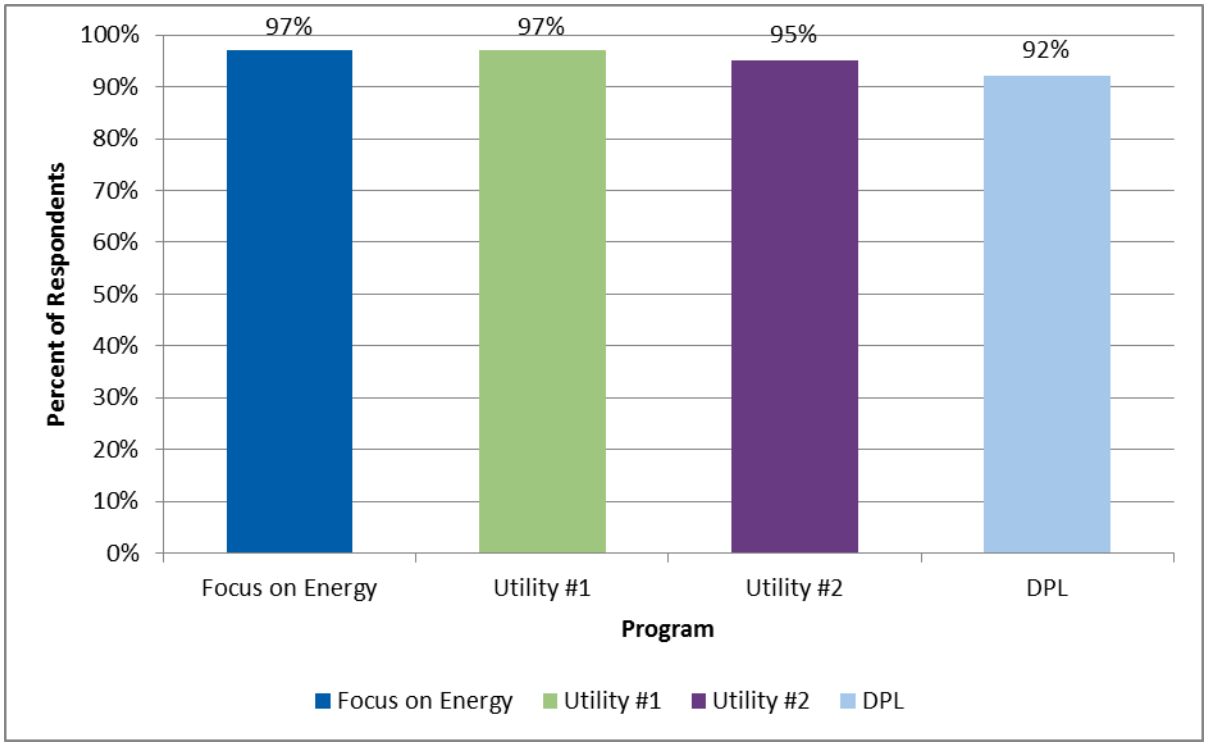
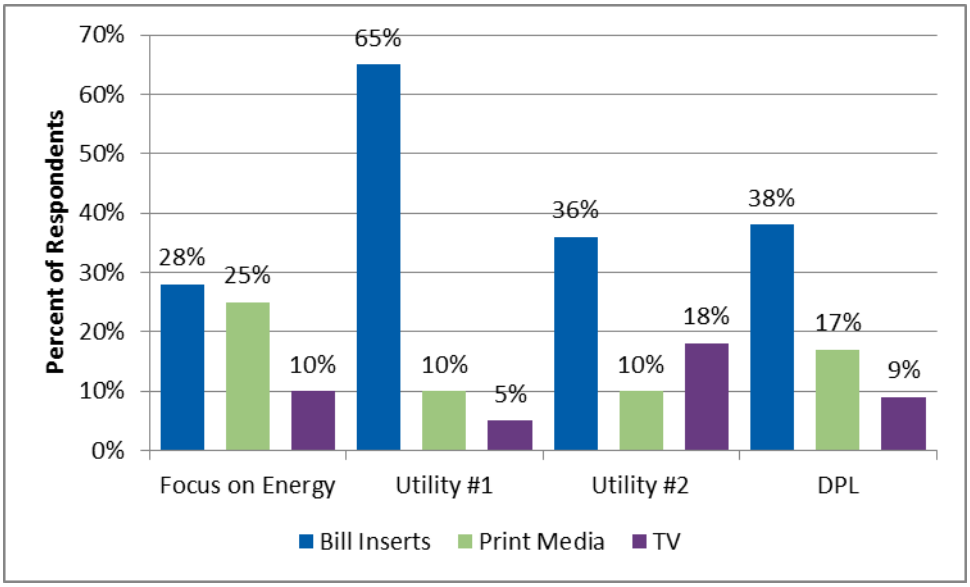


Figure 19 compares how participants were informed of their respective appliance recycling programs. For Focus on Energy, the proportion of participants who learned of the Program through bill inserts was much lower than for their counterparts. While Program awareness from TV advertising seemed to be

approximately consistent across all four utilities, more Focus on Energy participants learned of the Program through print media than did the participants from the other programs.

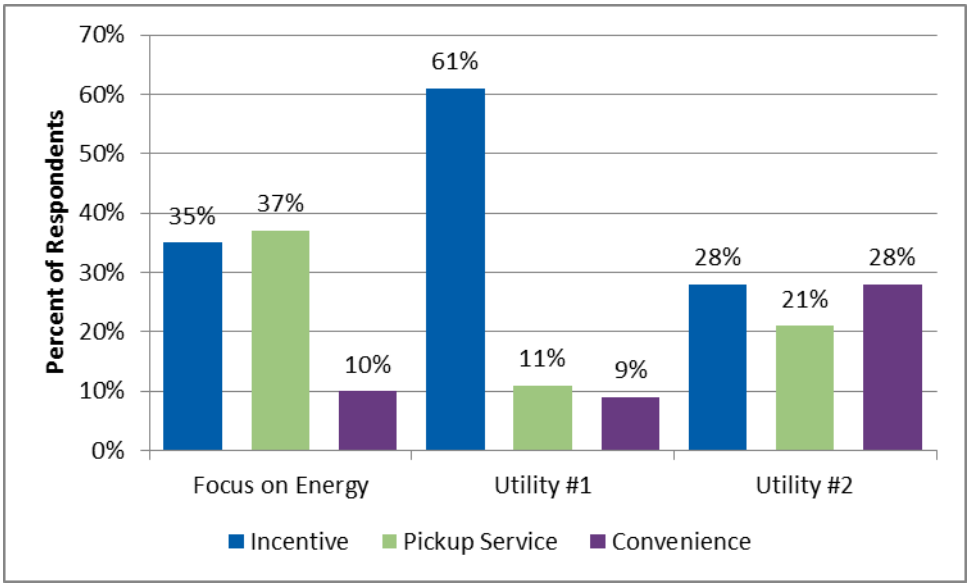
Figure 19. Program Awareness From Marketing Efforts



To understand potential differences in participant decision-making, the Evaluation Team benchmarked customer reasons for participating in the CY 2012 Appliance Recycling Program against responses from participant surveys conducted for Utility 1 and Utility 2.

As shown in Figure 20, the Utility 1 program participants placed a greater emphasis on the incentive, while the Utility 2 program participants placed an equal emphasis on the incentive and the convenience of disposing of their old units. Customers from all three utilities cited the incentive as either the first or second most-important reason for choosing the program over other disposal options.

Figure 20. Reason For Choosing Program Over Other Disposal Option[1]



[1]The DPL survey did not specifically ask this question

Trade Ally Response

The CY 2012 Appliance Recycling Program did not have any Trade Allies. Should there be collaborations with retailers in CY 2013; the Evaluation Team will assess those activities.

Program Cost Effectiveness

The benefit cost (B/C) test, also known as a cost-effectiveness test, is used to compare the benefits of a demand side management program with the costs of the program. There are several tests used for evaluating energy efficiency cost-effectiveness. The benefit cost test used in Wisconsin is a modified version of the total resource cost (TRC) test. This test is a commonly administered test for evaluating energy efficiency programs. A description of the test can be found in Appendix H.

The CY 2012 Appliance Recycling Program was found by the Evaluation Team to be cost effective (a TRC ratio above 1). Table 47 below provides the Appliance Recycling Program costs and benefits:

Table 47. Appliance Recycling Program Costs And Benefits

	Appliance Recycling Program
Incentive Costs	$404,730
Administrative Costs	$485,493
Delivery Costs	$1,107,141
Incremental Measure Costs	$0
Total Non-Incentive Costs	$1,592,634
Electric Benefits	$1,867,503
Gas Benefits	$0
Emissions Benefits	$729,212.23
Total TRC Benefits	$2,596,715
TRC Net Benefits	$1,004,082
TRC Ratio	1.63

Evaluation Outcomes and Recommendations

Impact

Outcome 1. The part-use factor will likely increase in future program years. Because CY 2012 was the first year of the Appliance Recycling Program, a large proportion of participants recycled secondary units. During the first program year of appliance recycling programs, participants typically recycle older, secondary units that were not in use, as the participants may have lacked the means to dispose of them. As the Appliance Recycling Program matures the part-use factor will likely increase.

Outcome 2. **Opportunities exist to increase the realization rate as the program matures.** The realization rate of the Appliance Recycling Program is lower than expected, for such reasons as: (1) the Program operated for 10 months rather than 12 months; (2) this was the first year of the Program; and (3) the high proportion of secondary units received, as previously mentioned, which are more likely to be part-use units. As a program matures, the proportion of primary units—which are in use for a greater portion of the year—increases thus increasing the part-use factor.

Recommendation 1: Adopt the modeled per-unit savings calculations for CY 2013. The Team recommends adopting the unit energy consumption estimated by the multivariate regression model. This model uses inputs from actual units recycled through the Program and accounts for usage behavior captured in participant surveys.

Recommendation 2: Continue to track changes in appliance characteristics. As appliance recycling programs mature, the ages of recycled units typically decline. Thus, the Program may be receiving more units manufactured after the energy-efficiency standards of the 1990s went into effect. Therefore, the Team recommends using modeled savings values instead of deemed savings and continuing to track metrics such as age, size, and configuration so as to estimate future savings accurately.

Process

Outcome 1. Opportunities exist for increased promotion of other Focus on Energy programs through the Appliance Recycling Program. The CY 2012 Program operated smoothly, and participants' satisfaction levels were very high, either on par with or superior to other benchmarked appliance recycling programs across the country. Furthermore, because participants and nonparticipants alike recognized the importance of saving energy, both groups could be good candidates for other Focus on Energy programs.

Outcome 2. **Conflicting indicators regarding the influence of incentive amounts invite further exploration of this issue.** Through extensive experience with other appliance recycling programs, the Program Implementer knows that a higher incentive is likely to attract greater participation. However, as noted in the participation survey results, only 12% of participants would have chosen not to participate had the incentive been smaller.

Outcome 3. **The Program Implementer sought out opportunities to improve the Program and increase energy/demand savings cost effectively.** For CY 2013, the Program Implementer has decided to form a retail partnership with multiple retailers (including Sears) in an effort to increase program participation and increase energy/demand savings cost effectively. In CY 2012, the Program Implementer also considered establishing a recycling facility in Eau Claire or Wausau to expand the program's presence in the state. However, neither area had sufficient participation in CY 2012 to justify a new facility. If Program participation increases in CY 2013, it may become feasible for the Program Implementer to add additional collection trucks and possibly an additional satellite base collection facility.

Recommendation 1: Assess the effect of providing a higher incentive in CY 2013. Potentially, an assessment of the effectiveness of an increased incentive amount can take place during the CY 2013 evaluation period, since the incentive level for the Program changed from $30 to $50 on January 1, 2013.

Recommendation 2: Continue to monitor the possibility of adding another recycling facility. The 16,000 unit goal for CY 2013 may result in the increased participation levels needed to justify additional collection trucks or an additional satellite base collection facility. Based on the current one-facility model, the average wait time (from customer call in to appliance pick-up) is 12 days. This wait time may increase in CY 2013 if the Program Implementer is recycling more units. However, the Program Implementer should note that the wait time had only a very minor impact on customer satisfaction in CY 2012, as only 6% of program participants found the wait time to be too long.

Home Heating Assistance Program

The Evaluation Team conducted both an impact evaluation and a process evaluation of the Home Heating Assistance Program. The ex post verified gross savings for CY 2012 are 82,528 kWh and 20,045 therms.

Under this Program, income-qualified residents were offered incentives to increase the energy efficiency and comfort of their homes by upgrading their space heating equipment. During CY 2012, there were 198 incentivized energy-efficient space heating measures installed that contributed to the Program's savings.

The Home Heating Assistance Program offered incentives on these space heating measures but only for the purchase of one of the high-efficiency furnaces and boilers listed in 2012 on the Focus on Energy Website[21]:

- Hot-Water Boiler (90% AFUE, <300 MBH)
- LP or Oil Furnace with ECM (90%+ AFUE, Existing)
- Natural Gas Furnace with ECM (90% AFUE)
- Natural Gas Furnace (90% AFUE)

M&V Approach

These were the key questions that directed the Evaluation Team's design of the M&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? What are other barriers specific to this Program and Segment?
- How is the Program leveraging the current supply chain for Program 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 the activities listed in Table 48 to obtain multiple perspectives in the assessment of the Program's CY 2012 performance. The scope of this evaluation did not include surveying customers or interviewing Trade Allies. The Team will conduct a more in-depth approach through Trade Ally and participant surveys in the CY 2013 evaluation.

[21] http://www.focusonenergy.com/residential/efficient-products-appliances/residential-rewards

Table 48. CY 2012 Home Heating Assistance Evaluation Activities

Activity	Evaluation Area	Completed Sample Size (n)	Absolute Precision at 90% Confidence[1]
Program Database Review	Impact	N/A	N/A
Stakeholder Interviews[2]	Process	4	N/A
Materials Review	Process	N/A	N/A

[1] Maximum absolute precision at 90% confidence is indicated only for activities designed to collect data that are statistically representative of the population. No precision level is associated with activities collecting anecdotal information not intended to represent any population.
[2.] The stakeholders interviewed were the Program Administrator's Program Manager and residential segment Manager, the Program Implementer's Program Managers.

Table 49 lists the efficiency standards of the Program measures and the applied incentives, as well as the energy type saved.

Table 49. Measure Types and Incentives

Measure	Efficiency Standard	Incentive	Energy Type Saved
Furnace	Natural Gas (90% AFUE)	$475	Gas
	Natural Gas, Propane or Oil Fired (90% AFUE with ECM)	$850	Gas & Electricity[1]
Space Heating Boiler	Natural Gas (< 300 MBH and 90% AFUE)	$750	Gas

[1] Propane and oil energy savings are not applicable to this Program.

Impact Evaluation

Tracking Database Review

The Evaluation Team reviewed the tracking database and did not find discrepancies in the data reported in the SPECTRUM database, missing savings values, or duplicates of savings associated with the measures installed under the Program. To determine the energy-efficiency ratings of the equipment installed at each participant home, the Team researched the equipment specifications by the manufacturer's name and model number.

About the Gas Energy Savings

The gas energy savings resulted from the installation of furnaces and space heating boilers with above-code energy-efficiency ratings (AFUE). The baseline efficiency for natural gas furnaces and boilers was assumed to be 78% AFUE, per the Federal Standard Code enacted in 1992 for residential natural gas furnaces. However in many cases, as dictated by Wisconsin's Uniform Dwelling Code, the efficiency rating for natural gas furnaces installed in single-family residential dwellings must be a minimum of 90% AFUE. Also, natural gas replacement furnaces and boilers are required to have an AFUE of 90%, unless the sealed duct system passes testing requirements or the boiler pump meets the requirements dictated in the code.

According to the Evaluation Team's conversations with contractors who did not participate in the program, furnaces rated at 90% AFUE or better are the most commonly used in the market. Thus, for

future program years, the Team recommends updating the baseline furnace AFUE in to reflect the realized savings value.

Through the Program tracking database review, the Team verified that all space heating equipment installed under the Program met the minimum efficiency rating of 90% AFUE. Specifically, the average efficiency rating for installed furnaces is estimated at 95.8% AFUE and the average efficiency rating for boilers is 94.5%, so both exceed the minimum AFUE required by the Program.

About the Electric Energy Savings

The electric energy savings resulted from the installation of furnaces with electronically commutated motor (ECM) fan types that used less power during calls for cooling, heating, or air circulation. The deemed electricity savings for furnaces with ECM measures was changed in early 2012, based on recommendations from the Evaluation Team to reduce the per-unit amount from 730 kWh to 500 kWh. The updated savings were communicated to the Program Administrator and the Public Service Commission of Wisconsin in April 2012, and the savings in SPECTRUM were updated in May 2012, and applied to Program measures entered in the database from that time on.

The demand savings from furnaces with ECM fans were obtained primarily from the reduced power draw during the cooling season. The Program claimed deemed savings values for all homes; however, the presence of a central air conditioning unit in the homes was not tracked. To monitor demand reductions more accurately, the Program Administrator should consider tracking the presence of a central air conditioning unit when a new furnace is installed central air conditioning unit when a new furnace is installed to ensure that deemed demand savings are not claimed for households without a central air conditioner. This data can be obtained by the installer documenting whether the household that received an ECM measure has a central air conditioner or not (or the installer can even take a picture of the unit). Then, it can be entered in the Home Heating Assistance Program database in the following format:

- Presence of air conditioner?
  - Yes / No
- Type of air conditioner?
  - Central or Wall / Window Mounted Unit

As shown in Table 50, the Evaluation Team calculated a realization rate of 100% for the Program in CY 2012. That is, 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 50. Home Heating Assistance Program Realization Rate

Realization Rate
100%

Engineering Assessments

To validate the tracked deemed savings for the Home Heating Assistance Program, the Evaluation Team relied primarily on:

- Assumptions from the deemed savings values previously used by the Program Implementer; and
- The Program tracking database, which contains deemed measure-level savings.

Additionally, the Team coordinated database assessments with the Program Administrator and the Public Service Commission of Wisconsin to account accurately for any evolution of the SPECTRUM database system.

Gross and Verified Gross Savings

The overall claimed gross and verified gross energy impacts (kWh, KW, and therms) for the Home Heating Assistance Program in CY 2012 are shown in Table 51. The Evaluation Team's analysis is based on the savings documented within the Program database and verified against program reporting.

Table 51. Home Heating Assistance Program Gross Savings Summary

	Gross			Verified Gross		
	kWh	KW	Therms	kWh	KW	Therms
Annual	82,530	32	20,046	82,528	32	20,045
Lifecycle	1,898,190	32	459,378	1,898,148	32	459,362

Net-to-Gross Analysis

The net-to-gross ratio for the Program is shown in Table 52; however, a net-to-gross analysis was not conducted during the CY 2012 evaluation. The Evaluation Team applied a net-to-gross value of 1.0 to the verified gross savings, based on discussions with the Evaluation Work Group, the Public Service Commission of Wisconsin, and the Program Administrator—and in consideration of the fact that the Program participants and target audience are income-qualified.

In future program years, as participation is expected to increase, the Team proposes to estimate Program net effects (including freeridership and spillover) and assess through surveys with contractors and participating customers those factors that drive participant decision-making.

Table 52. Home Heating Assistance Program Net-To-Gross Ratio

Net-To-Gross Ratio
100%

Net Savings

Table 53 lists the verified net energy impacts (kWh, KW, and therms) for the Program in CY 2012. The verified net savings are the same values as the verified gross.

Table 53. Home Heating Assistance Program Net Savings

Verified Net			
	kWh	KW	Therms
Annual	82,528	32	20,045
Lifecycle	1,898,149	32	459,362

Process Evaluation

The process evaluation of the Home Heating Assistance Program addressed these key questions:

- 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 Program measures, and what changes can increase the supply chain's support of the Program?

Program History and Design

Before the Home Heating Assistance Program was launched in January 2012, a Legacy Program that operated through the summer of CY 2011—Targeted Home Performance—offered incentives for heating, ventilation, and air-conditioning equipment (HVAC) equipment in conjunction with whole-house retrofits. This was also an income-qualified program.

The Home Heating Assistance Program was designed by the Program Administrator and Program Implementer to assist households earning only 60% to 80% of the State Median Income (SMI). Under the Program, Trade Allies throughout the state install high-efficiency HVAC equipment for eligible customers.

The Program Administrator set a goal of 1,365 measure installations for CY 2012. This goal reflected a potential participation level based on previous participation in the Federal Weatherization Assistance Program. However, only 210 measures were installed. The Program Implementer's staff speculated that confusion among Trade Allies regarding the Program, its purpose, and its requirements contributed to this substantial shortfall.

Program Delivery and Implementation

Trade Allies play a central role in Program delivery; consequently the bulk of the Program Implementer's marketing efforts are directed to Trade Ally recruitment and training. The Program Administrator and Program Implementer said that:

- They work closely with the Trade Allies to give them the resources needed to deliver the Program with minimal assistance; and
- They expect the Trade Allies to see increased business by promoting the Program.

In interviews conducted by the Evaluation Team, the Program Administrator and the Program Implementer mentioned that the discontinued Targeted Home Performance Program may have affected contractors' perception of the Home Heating Assistance Program. As mentioned, the Targeted Home Performance Program incented whole-home retrofits—rather than offering only HVAC upgrades—and

had more stringent Trade Ally requirements. Because both programs had similar income qualifications, contractors initially thought that Home Heating Assistance Program was either the same program or had similar Trade Ally requirements. According to the Program Administrator and the Program Implementer, this confusion reduced contractor participation, especially in the early months of implementation.

The Program Implementer also said that early in 2012, customers were either unaware of the Home Heating Assistance Program or had misconceptions about it[22]. Through discussions with Trade Allies, the Program Implementer found that customers did not always see themselves as "qualifying for assistance," and some contractors who enrolled at the beginning of the Program found it difficult or uncomfortable to discuss the income qualifications with customers.

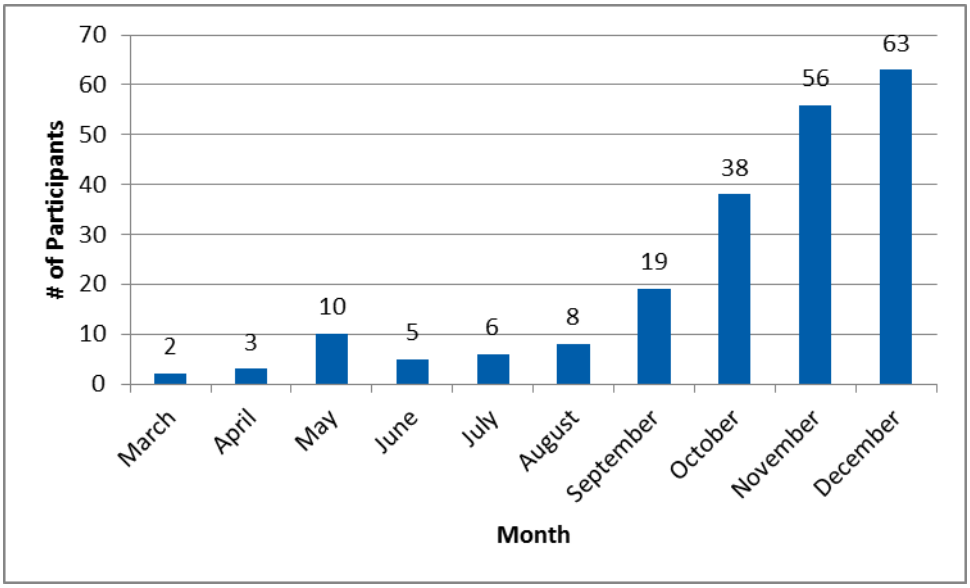
During the first half of 2012, as it became apparent that the Program was falling short of its target, the Program Implementer began a focused marketing campaign aimed at both Trade Allies and customers. This campaign, which was launched in July 2012, consisted of these tactics:

- Newspaper ads that ran in midsized markets throughout the state and contained the names of Trade Allies who had been recruited to participate;
- Telephone calls to Trade Allies; and
- A targeted mailer to Trade Allies.

The greatest increases in participation occurred between September and December, after the targeted marketing campaign launched. During this period, 84% of the 2012 participants enrolled in the Program. In addition to the marketing campaign, the cooler weather likely contributed to increased installations in the winter months, since homeowners tend to perform more HVAC upgrades during the heating season. Figure 21 shows monthly participation from March, when the first participants enrolled, through December 2012.

[22] The 2013 Evaluation will follow up on the various customer and Trade Ally issues raised during the 2012 Evaluation.

Figure 21. Home Heating Assistance Monthly Enrollment, March - December 2012



Effective January 1, 2013, the Program Administrator and the Program Implementer changed the Program name to "Enhanced Rewards" to eliminate possible confusion between the Home Heating Assistance Program and the Wisconsin Home Energy Assistance Program (the state's income-qualified heating subsidy program). The name change will also address the negative perception that accompanied the term "assistance."

Program Delivery

The Evaluation Team identified no supply chain concerns during the Home Heating Assistance Program's first year. However, the Program Implementer, noting that the potential for supply chain issues does exist, is making an effort to preempt any issues by marketing the Program at all levels of the supply chain: contractors, distributors, and manufacturers.

The Program Implementer initially considered implementing an instant discount option (as noted in the Operations Manual in CY 2012), which would have allowed contractors to discount their bids to customers by the amount of the incentive. Ultimately, the Program Implementer did not pursue this option for several reasons:

- There was little Trade Ally demand for it.
- The size of the discount might put Trade Allies at risk of losing money if they mistakenly installed a non-qualifying measure.
- Trade Allies might neglect to inform customers about the Program's purposes, thus failing to drive awareness among end users. Note that most programs offering instant discount options train Trade Allies on how to convey program sponsorship and general energy-efficiency information to qualifying customers.

Market Barriers

The only barrier described by the Program Implementer involved the installation of efficient equipment. At some locations, an efficient furnace or boiler could not be installed because the exhaust venting would have required updating to accommodate the new efficient unit. Specifically, exhaust from condensing units is vented through plastic material rather than through the metal materials used for non-condensing units; however, sometimes there were issues with relocating the vent due to physical obstructions.

Program Materials

The Evaluation Team found that all of the materials provided to Trade Allies by the Program Implementer were complete, clearly written, and gave effective guidance for implementation.

- The comprehensive operations manual—an internal tool—contains detailed steps on the income pre-approval, application, and reward processes. The manual also clearly defines the different parties' roles and responsibilities, based on Program objectives.
- The support documents consist of a call script with frequently asked questions (FAQs) and answers, a guide to the SPECTRUM database, and a summary sheet that lists measures and application guidelines. (Appendix L contains an in-depth Program materials review.)

Marketing, Outreach and Training

The Evaluation Team conducted a high-level review of the marketing materials used during CY 2012. As the scope of this evaluation did not include surveying Trade Allies or customers, those audiences were not solicited for their input on the effectiveness of the materials. However, such surveys will be conducted for the CY 2013 evaluation. (Appendix L contains an in-depth review of the Program materials.)

Marketing Materials

The Program Implementation staff markets the Home Heating Assistance Program to customers and Trade Allies through flyers, bill inserts, and banner ads. These materials are informative, and the Program Implementer presents important information clearly.

The Program Implementation staff also provides Trade Allies with materials such as fact sheets, talking points, and a guide for helping the customer through the application process.

Outreach

The Program Implementer has four Outreach Associates who travel throughout the state to promote the Program; they both recruit and work with the Trade Allies involved in the Program. The Program Implementer staff members said their most successful outreach occurred during in-person meetings with Trade Allies.

Training

As previously mentioned, the Evaluation Team did not speak with any Trade Allies in CY 2012, so no information was obtained on their views regarding the training process. (Note that the Team will interview Trade Allies in the CY 2013 evaluation.) The Team did, however, review the training

presentation given by the Program Implementer to Trade Allies interested in working with the Home Heating Assistance Program. This presentation provided a comprehensive overview of the Program requirements for both equipment and participants. It also gave Trade Allies useful tips on using the Program as a sales tool and on marketing energy efficiency in general.

Customer Response

The Evaluation Team will survey participants and nonparticipants in the CY 2013 evaluation.

Trade Ally Response

The Evaluation Team will interview Trade Allies in the CY 2013 evaluation.

Program Cost Effectiveness

The benefit cost (B/C) test, also known as a cost-effectiveness test, is used to compare the benefits of a demand side management program with the costs of the program. There are several tests used for evaluating energy efficiency cost-effectiveness. The benefit cost test used in Wisconsin is a modified version of the total resource cost (TRC) test. This test is a commonly administered test for evaluating energy efficiency programs. A description of the test can be found in Appendix H.

The CY 2012 Home Heating Assistance Program was found by the Evaluation Team not to be cost effective (the TRC ratio is less than 1). Table 54 below provides the Home Heating Assistance Program costs and benefits:

Table 54. Home Heating Assistance Program Costs And Benefits

	Home Heating Assistance Program
Incentive Costs	$155,150
Administrative Costs	$203,020
Delivery Costs	$462,977
Incremental Measure Costs	$105,954
Total Non-Incentive Costs	$771,952
Electric Benefits	$124,230
Gas Benefits	$371,070
Emissions Benefits	$101,758
Total TRC Benefits	$597,058
TRC Net Benefits	($174,893)
TRC Ratio	0.77

Evaluation Outcomes and Recommendations

Impact

Recommendation 1. Revise the savings values adopted from the latest Wisconsin's ECM metering study data (which will span a full year in June 2013) and adjust the deemed savings estimates associated with ECM fans retrospectively. During CY 2012, metered ECM fan data spanning a full year was not available. A full year's data will be available in June 2013. Moving forward, the Evaluation Team

recommends using the metered data (after June 2013) and the trend analysis to revise the deemed ECM fan savings values accordingly.

Recommendation 2. 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. In CY 2012, demand savings were claimed for all participant homes that had ECM fans installed. The Team recommends tracking the cooling system type in the Program database to ensure that homes without a central air conditioning system are not credited for demand savings associated with ECM fans.

Process

Outcome 1. After a slow start, the Home Heating Assistance Program saw increased participation at the end of CY 2012, but it still fell short of participation goals. After recognizing the need for better communication with Trade Allies and customers, the Program Implementer took steps to improve the awareness and understanding among these audiences. The focused marketing campaign that began in July 2013 used newspaper ads, follow-up phone calls, and mailers, all of which helped increase participation in the Program during the later months of CY 2012. Additionally, the Program Implementation staff chose not to proceed with the Instant Discount option.

Recommendation 1. Increase the use of focused marketing campaigns (similar to that of July 2012) and pursue marketing in conjunction with the Residential Rewards Program to increase customer and Trade Ally awareness of the Home Heating Assistance Program. July's campaign was successful in recruiting Trade Allies and in increasing customer participation. Similar campaigns could further raise awareness and participation. As the CY 2013 Program will have a new name—Enhanced Rewards—having a targeted marketing campaign and continuing the direct Trade Ally outreach would also create wider awareness of the Program offerings. Also, the Program Implementer said that the Enhanced Rewards and Residential Rewards programs should be presented as a single program that has different levels of qualification. This should help customers and Trade Allies avoid the confusion they experienced with the Home Heating Assistance Program in the early months of 2012. Furthermore, the name change will mitigate any negative perceptions that customers may have had about needing heating "assistance."

Recommendation 2. Investigate the impacts of offering the instant discount option to Trade Allies, as this can help sell the program to customers. While the Program Implementer expressed several concerns about this option, these concerns could be mitigated through effective education, monitoring, and tracking. Also, the instant discount eliminates the up-front cost barrier for customers and simplifies the rebate process by shifting incentive processing to the contractor. The Program Implementer should also consider surveying Trade Allies to gauge their receptiveness to this feature and to solicit their input on its design to ensure that this does not create a barrier for smaller Trade Allies.

Residential Lighting and Appliance Program

The Evaluation Team conducted both an impact evaluation and a process evaluation of the Residential Lighting and Appliance Program. The ex post verified gross savings for CY 2012 are 143,086,607 kWh and 25,375 therms.

Through a partnership with retailers around Wisconsin, the Residential Lighting and Appliance Program buys down the cost of compact fluorescent (CFL), light emitting diode (LED), faucet aerator, and low-flow showerhead measures to offer instant discounts on qualified products in stores.

M&V Approach

These were the key questions that directed the Evaluation Team's design of the M&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? What are other barriers specific to this Program and Segment?
- How is the Program leveraging the current supply chain for Program 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 the activities listed in Table 55 to obtain multiple perspectives in the assessment of the Program's CY 2012 performance.

Table 55. Residential Lighting And Appliance Research Activities

Activity	Evaluation Area	Completed Sample Size (n)	Absolute Precision at 90% Confidence[1]
Store Intercept Surveys[2]	Impact and Process	158	6.5%
Data Logger Installation	Impact	69	10%
Telephone Surveys	Impact and Process	251	5.2%
Stakeholder Interviews[3]	Process	4	N/A
Materials Review	Process	N/A	N/A

[1]Maximum absolute precision at 90% confidence is indicated only for activities designed to collect data that are statistically representative of the population. No precision level is associated with activities collecting anecdotal information not intended to represent any population.

[2]. Store intercept surveys were conducted by the Evaluation Team in 29 participating retail stores.

[3]. Stakeholders interviewed included the Program Administrator's Program Manager and residential segment Manager, and the Program Implementer's Director of Operations/ Program Manager.

Each data collection activity was specific to environment in which it was employed. For example,

- The store intercept survey gathered data about purchasing decisions and Program awareness, asking customers about signage, pricing, and perceptions of lighting technology.
- The telephone survey employed a random-digit dial approach, contacting Wisconsin residents via both landline and cellular phone numbers. The survey included questions about awareness of Focus on Energy, CFL and LED awareness and usage, CFL purchases, satisfaction with CFLs, and other energy-saving actions.
- Interviews with stakeholders involved in implementing the program provided insight into the Program process, staff roles, barriers to increased participation, and Program-design effectiveness.

The materials review assessed program materials for completeness and alignment with industry best practices.

Impact Evaluation

The Team's Residential Lighting and Appliance Program impact evaluation addressed these key questions:

- Is the Program meeting its objectives for reducing energy consumption and demand in the residential market segment?
- Are the necessary components in place to allow the Program's success to be effectively measured and evaluated?

The evaluation activities that informed the impact findings were a database review, engineering reviews, and a net savings review. Additional data were captured through on-site data logger installations and intercept surveys.

Table 56 lists the realization rate for CY 2012.

Table 56. Residential Lighting And Appliance Weighted Average Program Realization Rate

Realization Rate
99%

Tracking Database Review

In accordance with the implementation plan, the Program Implementer uses a separate database to track Program information.

- SPECTRUM is not designed for the clear tracking of pricing or the large quantity of measure sales in the Residential Lighting and Appliance Program.
- Participation and savings were not tracked in SPECTRUM in real time in CY 2012. Focus on Energy has a goal of entering final figures and assumptions into SPECTRUM in the future.

The Evaluation Team reviewed the Residential Lighting and Appliance Program database, which is kept separately from the SPECTRUM database. The Team used the information from the Program database in conjunction with information gathered from the Program Administrator to conduct engineering reviews for evaluating the verified gross and electric gas savings.

Although the results reported in the CY 2012 evaluation report do not include the adjustments from the engineering reviews, the Evaluation Team used deemed assumptions and algorithms—in addition to the Program data—to verify the measure-level savings. All measures received near-identical unit energy savings as reported. However, a discrepancy in the weighted savings attributed to showerheads resulted in changes in allocation of savings fuel type. Focus on Energy had attributed 66% of the weighted savings to gas energy and 34% to electric energy, but the Evaluation Team applied research findings of 61% gas and 30% electric, with the remaining 9% attributed to propane users.

Gross and Verified Gross Savings

The CY 2012 Residential Lighting and Appliance Program sold 4,054,198 unique program units and paid $5,173,350.25 in incentives. Table 57 lists the total gross savings and verified gross savings achieved by the Program in CY 2012.

Table 57. Residential Lighting and Appliance Program Savings Summary

	Gross			Verified Gross		
	kWh	KW	Therms	kWh	KW	Therms
Annual	159,456,944	19,396	21,686	143,086,607	17,404	25,375
Lifecycle	958,084,227	19,396	260,232	860,046,285	17,404	304,503

Net-to-Gross Analysis

The Evaluation Team estimated the net-to-gross value of 59.5% for Focus on Energy's Residential Lighting and Appliance Program using the following formula:

$$Recommended\ NTG = 1 - Freeridership$$

The Team calculated freeridership by using the results from an econometric price-response model populated with sales tracking data and marketing event information from the Program Implementer. Through this approach, the Team estimated that freeridership accounted for 40.5% of Program savings. Further details on net-to-gross methodology, data preparation, estimation and result for the Residential Lighting and Appliance Program are provided in Appendix K. The price elasticity model was used as an alternative to the originally proposed standard market practice calculation of net-to-gross. While the Evaluation Team will continue to look for alternative methods to calculate net-to-gross, the model used for the CY 2012 Evaluation does not account for spillover. In the 2012 Residential Lighting and Appliance Program evaluation, the net-to-gross equals the net of freeridership value.

The price-response model is a consumer-demand model developed by the Team to predict the level of demand for bulb sales in absence of the Program. As outlined in the National Action Plan for Energy

Efficiency,[23] econometric methods of estimating net savings are an option when comprehensive and detailed data are available.

The price-response model measures the price elasticity of demand for Program light bulbs. This approach shows the responsiveness (elasticity) of the quantity demanded of a product (light bulb) to a change in its price. Further details on the price-response model is provided in Appendix K.

Data Preparation

For each unique combination of retailer, model number, and incentive level, the Program dataset provided by APT contained the following fields relevant to the Team's analysis:

- Original retail price
- Incentive provided by Focus on Energy
- Target retail price
- Number of bulbs per package
- Number of packages sold
- Model designation (specialty, LED, fixture, standard)
- Program month in which the product was sold

The Evaluation Team removed coupon sales from the analysis, as sufficient data were not available to estimate a net-to-gross for these bulb sales alone. Thus, the net-to-gross applied to coupon sale bulbs was the net-to-gross from the model.

The Team modeled the data as a panel, with a cross-section of Program package quantities modeled over time. Of total bulb sales, only 9% of products listed in the Program incurred price variations over the Program period. The bulbs that incurred price variations were, for the most part, standard bulbs. However, some stores carried specialty bulbs that accounted for 16% of total Program sales. In addition, those retailers where the price variations occurred accounted for a majority of the Program sales.

The data provided by APT contained prices—with and without Program incentives—for all bulbs. Thus, the price and demand variations within the Program period formed the basis for the demand modeling. This approach allowed the Evaluation Team to estimate the market response to the Program discounts. Thus, the Team tested the model, including all bulbs and a scenario with only those with varying incentives, during the Program period. Both scenarios yielded similar results.

Demand Modeling

The Team modeled product sales over time as a function of price, incentive, number of promotional events, and other relevant variables described below. The Team also tested a variety of specifications to ascertain the impact of price, which is the primary aspect affected by the Program, on the demand for

[23] *National Action Plan for Energy Efficiency*. Model Energy Efficiency Program Impact Evaluation Guide. 2007. Available online: www.epa.gov/eeactionplan.

bulbs.[24] This model assumes that bulb sales are a function of bulb characteristics, seasonal trends, and price.

The basic equation for the revealed-preference model was estimated as follows (for bulb model *i*, in period t):

$$\ln(Q_{it}) = \beta_1 + \beta_2 \ln(P_{it}) + \beta_3 Multi\ dum_i * \ln(P_{it}) + \beta_4 DIY\ dum_i * \ln(P_{it}) + \beta_5 Promo\ dum_{it} + \beta_6 POut\ dum_{it} + \sum_{\pi}(\beta_\pi model\ dum_{\mathrm{i}}) + \sum_{\delta}(\beta_\delta month\ dum_t) + \varepsilon_{it}$$

Where:

ln	= natural log
Q	= quantity of bulbs sold during the month[25]
P	= average retail price (after markdown) in that month
Mutli dum	= a dummy variable equaling 1 if the pack size of bulb, *i*, is greater than 1; 0 otherwise
DIY dum	= a dummy variable equaling 1 if the retailer is a Do-it-yourself store; 0 otherwise
Promo dum	= a dummy variable equaling 1 if the bulb type, *i*, was either put on an end cap display and/or and in-store promotion in time period t; 0 otherwise
POut dum	= a dummy variable equaling 1 if bulb type, *i*, sales were phased out in time period t; 0 otherwise
model dum	= a dummy variable equaling 1 for each unique retailer and model number; 0 otherwise
month dum	= a dummy variable equaling 1 in a given month; 0 otherwise

The β_2 through β_4 coefficients each represent a specific price elasticity of demand.

- The β_2 represents the price elasticity of demand for single-pack bulbs in non-Do It Yourself (DIY) stores.
- The β_3 coefficient represents the difference in price elasticity of demand between single-pack and multi-pack bulbs.
- The β_4 coefficient represents the difference in price elasticity of demand between DIY and non-DIY stores.

[24] The focus of these diagnostics was to ensure the Team included all explanatory variables.

[25] For this analysis, months were defined as 4-week intervals, as retailer-reporting periods were not consistent. Some retailers reported bulb sales weekly while others were 4- or 5-week intervals.

Using these estimates, the Team predicted sales with and without the Program. The difference in sales scenarios yields the "sales lift" attributable to the Program. The ratio of sales lift to total incented sales equals net of freeridership:

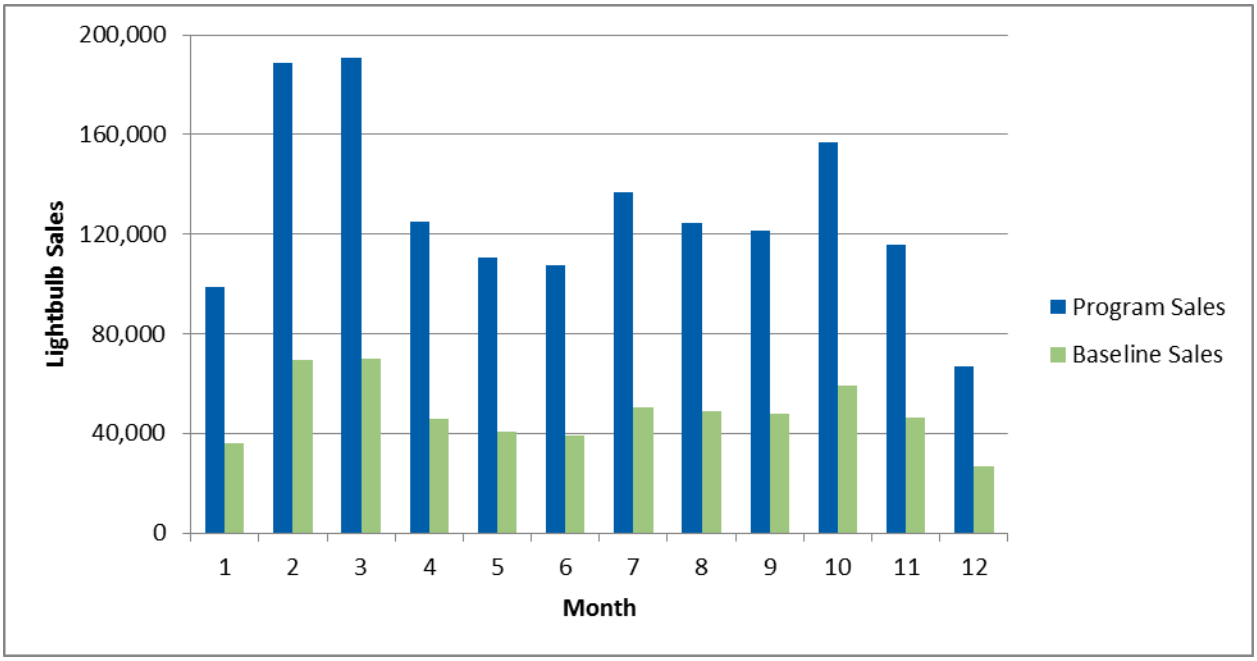
$$1 - FR = \frac{Sales\ with\ Program - Sales\ without\ Program}{Sales\ with\ Program}$$

The β_5 coefficient captures some of the impact of the Program that is not necessarily attributed to price. This included end-cap displays and in-store promotions for specific bulb models.

Results

Using a demand model, the Evaluation Team predicted what the bulb sales would have been without Program incentives. To complete this analysis, the Team used the model coefficients to predict sales as if prices had been at their original retail price without end-cap displays or in-store promotional events. The difference in sales (weighted by gross annual kWh savings per bulb model) between this hypothetical scenario and what actually occurred provides net sales attributable to the Program, shown in Figure 22. The ratio of these sales to the total Program sales is equal to freeridership.

Figure 22. Estimated Program Sales And Baseline Sales



Program-wide freeridership was found to be within the values expected for mature upstream lighting programs. Table 58 lists values for standard CFLs and specialty CFLs. Note that the Team was also able to estimate freeridership by distribution channel, as shown in Table 59.

Table 58. Program Net of Freeridership

Model Type	Freeridership	Net of Freeridership
Standard CFLs	39%	61%
Specialty CFLs	59%	41%

The Team predicted monthly sales and corresponding kWh savings for each individual bulb model, as described above, and then aggregated these results by retail channel and bulb type. Taking the difference in predicted sales with the Program and predicted sales in absence of the Program allowed the Team to estimate net-to-gross by retail channel and bulb type (standard and specialty CFLs), as shown in Table 59.

Table 59. Incentives As A Share Of Original Price And Net-To-Gross By Retail Channel And Bulb Type

Retail Channel	Bulb Type	Average Original Retail Cost per Bulb	Average Incentive per Bulb	Percentage of Original Retail	Net of Freeridership
Do-it-yourself	Standard	$2.57	$1.27	50%	69%
	Specialty	$6.61	$1.50	23%	41%
Dollar	Standard	$4.14	$1.25	30%	34%
	Specialty	$5.00	$1.50	30%	44%
Local Chain	Standard	$2.67	$1.20	51%	64%
	Specialty	$6.46	$1.50	24%	34%
Residential Retailer	Standard	$2.00	$1.22	62%	61%
	Specialty	$5.23	$1.50	32%	37%

The results suggest that increasing the incentive as a share of the original retail price tends to increase net-to-gross. Program-wide freeridership was found to be within values expected for mature upstream lighting programs and comparable with that of the previous evaluation: 62%.

Net-To-Gross Benchmarking

Upstream lighting net-to-gross values can be difficult to compare between programs, as estimation techniques vary widely. However, Cadmus performed this same demand modeling methodology for the Efficiency Maine Trust, an East Coast consortium of utilities, and two Midwestern utilities. Table 60 compares net of freeridership results with the average incentives paid for evaluated bulb types among the five programs. As seen in the table below the Focus on Energy program had high incentives as a share of total retail price. This results in above average net-to-gross results, when compared to the other programs.

Table 60. Incentive As A Share Of Retail Price By Bulb Type

Upstream Lighting Program	Bulb Type	Average Original Retail Cost per Bulb	Average Incentive per Bulb	Percentage of Original Retail	Net of FR
Focus on Energy	Standard	$2.31	$1.24	54%	0.61
	Specialty	$5.63	$1.51	27%	0.41
East Coast Consortium	Standard	$2.03	$1.23	61%	0.59
	LEDs	$34.30	$9.69	28%	0.22
	Specialty	$5.23	$1.73	33%	0.33
	Reflector	$4.70	$1.82	39%	0.39
Efficiency Maine 2010-2011	Standard	$3.65	$1.02	28%	0.68
	Specialty	$6.77	$1.33	20%	0.08
Midwest Utility 1	LED	$36.99	$13.94	38%	0.83
	Specialty	$5.20	$1.90	37%	0.65
Midwest Utility 2	Standard	$2.11	$1.00	47%	0.51
	Specialty	$5.01	$1.56	31%	0.24

Net Savings

Table 61 lists the total net savings for the Residential Lighting and Appliance Program.

Table 61. Residential Lighting And Appliance Program Net Savings

Verified Net			
	kWh	KW	Therms
Annual	85,125,081	10,354	13,956
Lifecycle	511,590,141	10,354	167,477

Process Evaluation

The process evaluation for the Residential Lighting and Appliance Program addressed these key questions:

- What is the Program process (for example how does it deliver lighting to customers)?
- Are key staff roles clearly defined?
- How can the Program be improved to increase the energy and demand savings?
- What is the satisfaction level with the Program among customers and market actors?
- What are the barriers to increased customer participation?
- How effective is the Program design in overcoming those barriers?
- How is the current supply chain being leveraged, and what changes can increase the supply chain's support of the Program?

Program History and Design

Focus on Energy has offered an upstream residential lighting program[26], similar to the current Residential Lighting and Appliance Program, since 2006. This history, according to both the Program Administrator and the Program Implementer, helped ensure a smooth transition to the new Program when it launched on January 1, 2012. Very little disruption occurred in Program operations or at the customer or retailer level. This smooth transition, and the minimal changes to the process relative to the Legacy Program, allowed the Residential Lighting and Appliance Program to make immediate progress toward its CY 2012 goals.

Design

This Program provides instant rebates for energy-efficient light bulbs (CFLs) and high-efficiency showerheads. In the fall of CY 2012, the Program Implementer added LED light bulbs to the measure offerings. The Program rebates take two forms:

- Automatic markdowns at the time of purchase, and
- Markdowns through paper coupons offered via smaller, locally owned retailers.

In CY 2012, nearly 100% of Program bulbs were discounted through the automatic markdown, with only 0.03% of Program bulbs discounted with coupons. Furthermore, 83% of Program bulbs were sold at "big box" stores.[27]

At some participating retail locations, the Program also offers CFL recycling. These retailers collect used CFLs from customers and ship them to a center to be recycled in accordance with environmental regulations. Because large retailers tend to have their own CFL disposal programs, smaller retailers are most likely to offer recycling through the Residential Lighting and Appliance Program.

The upstream design of the Program requires that participating retailers sign a memorandum of understanding (MOU) with the manufacturer and the Program Administrator. The MOU establishes the incentive levels for the Program bulbs.

The Program Administrator and Program Implementer established CY 2012 participation (sales) and savings targets through a collaborative process that relied on both the results from other jurisdictions (adjusted for Wisconsin) and the Focus on Energy legacy lighting program's historical results. The Program Administrator and Program Implementer also set goals for training participating retailer sales associates and educating customers.

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[26] "Upstream" programs work with manufacturers and retailers to provide discounts at the retail level, rather than requiring customers to apply for an individual rebate. Most lighting programs offered in United States reach customers primarily through an upstream component; they may also allow the purchase of Program-qualifying light bulbs online or offer a coupon that goes to the utility after being completed.

[27] These large retailers include Costco, Home Depot, Lowe's, Menards, Sam's Club, and Wal-Mart.

As described in the impact evaluation the Program successfully met its participation, incentive, training, and education targets for CY 2012. To enhance savings for CY 2013, the Program Implementer and Program Administrator are considering additional measures, such as appliances and less-costly LED lamps.

Program Management and Implementation

CY 2012 Program management and implementation went smoothly, and the Evaluation Team identified no significant issues or barriers to success. The Program Administrator and Program Implementer both report having a positive relationship with one another, as well as with participating retailers.

The Program Implementer runs similar programs across the country and has developed excellent relationships with both manufacturers and retailers. These existing relationships facilitated the CY 2012 Program's smooth launch. In addition to working effectively with national retail chains, the Program Implementer has developed good working relationships with smaller and local retailers throughout Wisconsin. The Program Implementer reported that smaller local retailers can provide some of the most noteworthy examples of successful market transformation, because these storeowners work directly with the Program to promote efficient technologies.

Through interviews, the Evaluation Team found the Program Implementer's and Program Administrator's roles to be clearly defined.

The Program Implementer's responsibilities are these:

- Perform retailer outreach,
- Create point-of-purchase marketing materials,
- Negotiate incentive levels with retail partners,
- Administer rebate payments,
- Oversee the field staff,
- Train retail staff,
- Educate customers, and
- Negotiate the MOUs.

The Program Administrator's responsibilities are these:

- Develop brand standards and approve the marketing materials the Program Implementer creates,
- Approve and sign MOUs with retail partners and manufacturers,
- Coordinate with utilities,
- Facilitate coordination across all programs;
- Manage communications to stakeholders;

- Provide customer service, and
- Manage the performance of the CY 2012 Program.

Program Materials

The Evaluation Team reviewed the following materials provided by the Program Administrator and Program Implementer: the implementation plan, the Wisconsin Focus on Energy Residential Lighting Program Markdown Manual, and the Wisconsin Focus on Energy Residential Lighting Program Coupon Manual for participating retailers.

While most of the materials are complete and clear in their communication of Program processes, the implementation plan was missing certain elements. Specifically:

- There were no names or contact information for the Program Manager, Program Coordinator, Senior Field Representatives, and other Field Representatives.
- The organizational chart did not clearly show which personnel report to which senior or lateral personnel.
- A process flow diagram exists for incentive processing, but not for the Program as a whole.

The Evaluation Team also noted that Program materials refer to the Program by several different names (including Retail Lighting and Appliance Program and ENERGY STAR Lighting Program). This inconsistency appears to be related to the CY 2012 Program transition to a new Program Administrator and Program Implementer. For more information on Program materials, see the Program Materials Review section of Appendix L.

Marketing, Outreach and Training

Marketing Materials

The Evaluation Team assessed these marketing materials:

- In-store displays
- Coupons, information used during in-store demonstrations
- Program Website, and
- Marketing Materials Look Book.

The Program Administrator and Program Implementer reported that radio advertising will be added to the Program's marketing tactics in CY 2013.

While conducting intercept surveys in participating retail stores, members of the Evaluation Team examined in-store display materials. Figure 23 shows an example of a Focus on Energy in-store display materials: a promotional sticker on the shelf next to the retail-pricing sticker.

Figure 23. Focus on Energy Promotional Sticker At A Participating Retail Location[1]



1 Note this photograph shows a previous version of the Focus on Energy logo (different branding colors) because it was taken during Evaluation Team intercept visits in October 2012. The new logo was launched in January 2013.

Overall, the Program's marketing materials explain the Program clearly and effectively, providing adequate information to customers. The Website enables customers to locate Program information, provides systematic instructions on how to participate, and offers a list of participating retail locations.

Outreach

During CY 2012, the Program Implementer conducted three types of outreach:

- To retailers, recruiting new ones to participate and maintaining relationships with those retailers who are currently participating,
- To customers, promoting energy efficiency by providing information about the technologies offered through the Program, and
- To manufacturers, developing partnerships with retailers to promote Program participation.

The Program Implementer builds on its existing relationships with national retailers and manufacturers to establish participation among Wisconsin retailers. The Program Implementer reported that, in general, retailers are very receptive to participating in the Program. In cases where retailers are hesitant to participate, the Program Implementer reaches out to manufacturers, and those manufacturers typically encourage the retailer to participate in the Program.

To support participating retailers—and to conduct customer outreach—the Program Implementer has a team of 10 field representatives who visit stores. During these visits, the field representatives check on both the signage and the pricing to ensure consistency with Program requirements. In addition, the Program Implementer assists the field staff with specific high-impact tasks such as coordinating with retailers on end-cap displays for Program bulbs. The field staff also conducts in-store demonstrations to

educate customers and trains retailer staff on Program offerings and opportunities for cross promoting other Focus on Energy programs.

The in-store demonstrations have been the Program's primary tactic for educating retail customers about the Program, energy efficiency, and Focus on Energy. During these demonstrations, the Program Implementer's staff works with the participating retailers to:

- Display efficient lighting products available through the Program at that location;
- Provide comparisons of these products with incandescent light bulbs;
- Provide information on the amount of time CFLs take to reach full brightness, mercury in CFLs, and disposal of the bulbs; and
- Offer customers marketing materials for other Focus on Energy programs.

The Program Implementer reported completing 11,646 store visits in CY 2012, either to perform in-store demonstrations or to verify that Program materials were properly displayed. During these visits, field staff trained and educated 22,454 customers and retail staff. However, these numbers have not been independently verified by the Evaluation Team.

The Program Implementer reported that the store visits have been successful in increasing Program bulb sales and educating customers through demonstrations, in addition to providing an opportunity to check Program pricing and signage. This perception was confirmed through the Evaluation Team's telephone survey results, which showed that 22% of 213 respondents learned about CFLs from retail stores display or advertisements. This result indicates that a substantial share of the market is learning about the products in stores.[28] This number is slightly higher than, but consistent with, the results in other jurisdictions in which the Program Implementer operates.[29]

Training

Because in-store demonstrations are the primary customer outreach tactic for education, having a well-informed field staff is critically important. The Program Implementer provides several types of training for field staff:

- Initially, field staff receive one week of classroom-based training on topics including energy efficiency, lighting and appliance standards, and Focus on Energy-specific procedures such as how to track Program data.
- The classroom training is followed by one week of field training in which a new field technician shadows an experienced field technician.
- Field staff also participates in ongoing weekly conference calls and quarterly training meetings.

[28] This question asked how respondents first heard of CFLs, and it was not tied to any recent timeframe.

[29] Cadmus. 2012. Efficiency Maine Trust Residential Lighting Program Evaluation: Interim Report, April 9, 2012.

The following materials are included in both the Coupon Manual and Markdown Manual, which are used in retailer training:

- An overview of the CY 2012 Residential Lighting and Appliance Program,
- Sales floor reference sheet,
- Coupon information,
- Point of purchase materials,
- An overview of ENERGY STAR, and
- Information on CFLs and mercury as an air pollutant byproduct of electricity generation.

During store visits, the field staff members review the Program materials with retail staff. However, even with frequent in-store education, the high employee turnover in retail stores creates a challenge (which is common in retail-based lighting programs). In CY 2012, the Program Implementer addressed this issue by scheduling repeat visits to each participating retail location.

Customer Response

The Evaluation Team's customer survey gathered information from a random sample of Wisconsin residents, some of whom had purchased Program-discounted products during CY 2012. This section summarizes the key findings from that survey.

Although the Program provides in-store education, customers do not need to be aware of the Program for it to be successful. Slightly less than three-quarters of those surveyed (74%) did not know that Focus on Energy offers discounts on CFL and LED products. When customers were asked if they recalled having purchased any CFLs discounted by a utility or other energy-efficiency program, 11% recalled making such a purchase. Because many customers who purchased Program-discounted products may not have known they were doing so, the Evaluation Team examined customer satisfaction by assessing awareness of and satisfaction with CFLs and CFL pricing.

As shown in Table 62, a large majority of survey respondents had heard of CFLs: 85% have CFLs in their home[30] and another 10% had heard of them. Only 4% of respondents had not heard of CFLs.

Table 62. CFL Usage And Awareness (N=251)

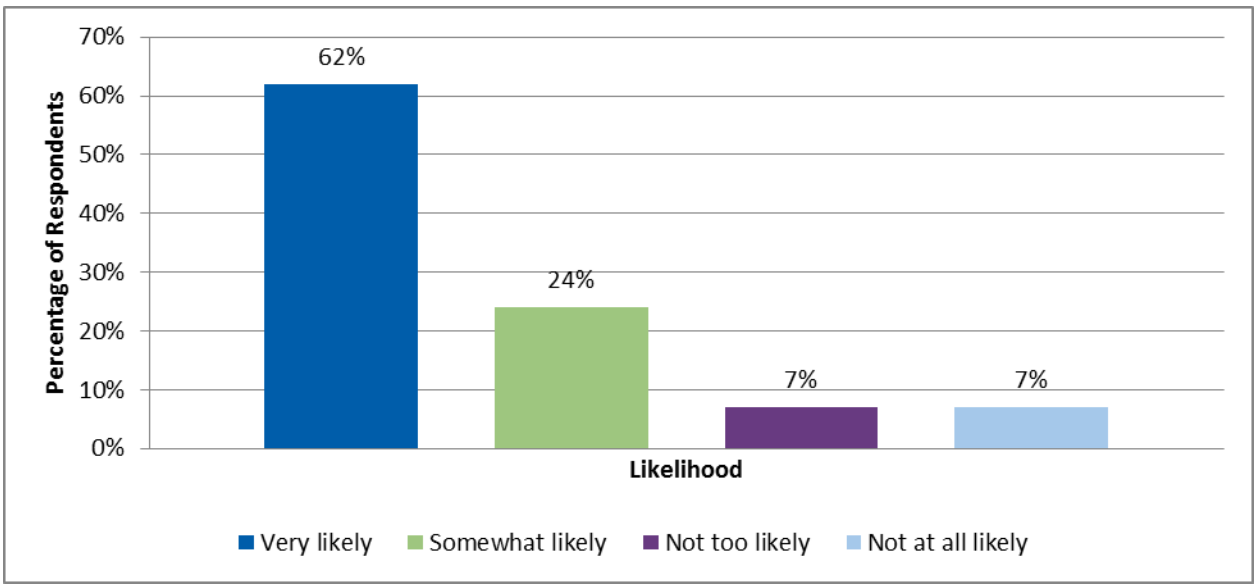
	Percentage of Respondents
Have CFLs in home	85%
Do not have CFLs in home, but have heard of them	10%
Do not have CFLs in home, and have not heard of them	4%

Source: Focus on Energy Residential Lighting Customer Survey Questions A3 and A4. (Percentages do not add to 100% due to rounding.)

[30] During site visits conducted in 2012 and 2013, Evaluation Team staff verified the presence of installed CFLs in the home of every telephone survey respondent who claimed to have CFLs installed and agreed to participate in a lighting study.

Overall, the surveyed customers are satisfied with the CFLs that they currently have or have previously had. Approximately 90% rated themselves as either "very satisfied" or "somewhat satisfied" with the bulbs, and 62% said they are "very likely" to replace a CFL with another CFL when it burns out (Figure 24). However, the remaining 38% may not continue to use CFLs.

Figure 24. Likely To Replace A Burned-Out CFL With Another CFL



Source: Focus on Energy Residential Lighting Customer Survey Question B11.

When the Evaluation Team asked questions about satisfaction with CFL pricing, 86% of respondents who had purchased a CFL within the last 12 months were either "very satisfied" or "somewhat satisfied" with the price they paid. However, the proportion of "very satisfied" responses was significantly higher among customers who recalled purchasing discounted bulbs (48%), compared to customers who had not made discounted purchases (26%). This indicates that customers who recall receiving a discount on CFLs are more likely to be highly satisfied with the price they paid for the CFLs.

Because the Residential and Appliance Program is an upstream program, the Evaluation Team does not assess customer satisfaction directly. However, from these data, the Evaluation Team infers a high degree of Program satisfaction among customers.

Respondents who said they were not satisfied with CFLs most frequently cited these reasons:

- Cost (46%; n=16),
- Time required for the bulb to reach full brightness (31%; n=11), and
- Color of the light (31%; n=11).

The survey also asked respondents who had not purchased any CFLs why they had not done so. The most common reasons they cited were these:

- Concerns about mercury (29% of the 14% without CFLs in their homes; n=4); and
- The need to recycle the bulbs (21% of the 14% without CFLs in their homes; n=3).

As noted above, the in-store demonstrations are designed to address many customer concerns.

Program Cost Effectiveness

The benefit cost (B/C) test, also known as a cost-effectiveness test, is used to compare the benefits of a demand side management program with the costs of the program. There are several tests used for evaluating energy efficiency cost-effectiveness. The benefit cost test used in Wisconsin is a modified version of the total resource cost (TRC) test. This test is a commonly administered test for evaluating energy efficiency programs. A description of the test can be found in Appendix H.

The CY 2012 Residential Lighting and Appliance Program was found by the Evaluation Team to be cost effective (a TRC ratio above 1). Table 63 below provides the Residential Lighting and Appliance Program costs and benefits:

Table 63. Residential Lighting And Appliance Program

	Residential Lighting and Appliance Program
Incentive Costs	$5,151,536
Administrative Costs	$850,403
Delivery Costs	$1,939,298
Incremental Measure Costs	$9,652,511
Total Non-Incentive Costs	$12,442,212
Electric Benefits	$28,817,743
Gas Benefits	$149,807
Emissions Benefits	$11,918,845
Total TRC Benefits	$40,886,396
TRC Net Benefits	$28,444,183
TRC Ratio	3.29

Evaluation Outcomes and Recommendations

Impact

Outcome 1: The in-service rate for lamps incented through the Program in CY 2012 was 90%. This means 10% of the bulbs that were recorded in the database and used for calculating savings were either in storage, had been removed after installation (often because of unit failure or dissatisfaction), or in the case of multi-bulb fixtures – were based upon a higher than actual assumption of the number of bulbs per fixture.

Process

Outcome 1: The Residential Lighting and Appliance Program had a smooth transition from the Legacy Program, which enabled the Program to make immediate progress toward its CY 2012 targets. This history, according to both the Program Administrator and the Program Implementer, facilitated a smooth transition to the new Program when it launched on January 1, 2012. Thus, very little disruption occurred in Program operations or at the customer or retailer level.

Outcome 2: The Evaluation Team infers a high degree of Program satisfaction among customers. Because of the upstream nature of the Program, the Team does not evaluate customer satisfaction directly. However, the Team infers a high degree of Program satisfaction because 86% of respondents who had purchased a CFL within the last 12 months were either "very satisfied" or "somewhat satisfied" with the price they paid. Moreover, the proportion of "very satisfied" responses was significantly higher among customers who recalled purchasing discounted bulbs.

Outcome 3: There is no formal, documented agreement between the Program Implementer and retailers regarding in-store demonstrations. The Program Implementer reported in-store demonstrations were not formally arranged through either the MOU or another agreement.

Recommendation 1: Given the importance of in-store demonstrations, the Program Implementer should secure its primary customer outreach tactic. As such, the Program Implementer should consider formal documentation to allow for in-store demonstrations. If such formality is not available, or appropriate, the Program Implementer should consider using alternative means, such as an expanded media campaign, to make customers aware of the Program.

Outcome 4: Although in-store demonstrations reportedly drive increased sales, such demonstrations may have the potential to reach more customers through more interaction. According to the Program Implementer's reported training numbers, field staff educated an average of approximately two individuals per store visit. The Evaluation Team confirmed this finding when visiting 29 participating stores to conduct intercepts. The Evaluation Team observed a low level of interaction with customers and noted that, in some cases, the in-store demonstrations were not near the area of the store that sold lighting.

Recommendation 2: The Program Implementer should explore ways to increase interaction with customers at in-store demonstrations. While retail barriers to increased interaction may exist, possible avenues to consider include these:

- Working with retailers to request that in-store demonstrations occur closer to the lighting aisle;
- Developing a bonus incentive to customers who visit the in-store demonstrations; and
- Prioritizing outreach to customers during these events.

The Evaluation Team acknowledges that there are a variety of factors that inform when and where the in-store demonstrations occur. In particular in order to have access to the store Implementer staff must respect store manager preferences or constraints on timing and location. Consequently the Evaluation Team acknowledges that the Implementer does not have full control of achieving the objectives noted

above, however the Evaluation Team still believes that these are best practices that should be pursued to the greatest extent possible.

Outcome 5: The LED measure offered in CY 2012 was responsible for a small percentage of Program savings. However, there is potential for the Program to gain increased savings by pursuing more LED product options in the future. The Program Administrator and Program Implementer stated that the Program's LED component has two predominant barriers: high cost and lack of available measure selection. The Program Administrator reported that the only LED measure offered in CY 2012 cost as much as $50 without the incentive

Recommendation 3: To increase uptake of emerging technologies, the Program Administrator should continue to seek out cost-effective LED products to add to the Program measure mix. For CY 2013, the Program Implementer and Program Administrator are considering additional measures to enhance savings, such as appliances and less-costly LED lamps. However, all program lighting must be ENERGY STAR-certified, so this may limit the brands of LEDs available.

Outcome 6: Although the Program Implementer's materials were largely complete, some elements of documentation were missing. Incomplete Program documentation has the potential to hinder effective and timely implementation.

Recommendation 4: Improve the Program documentation by making several additions. The Program Implementer should consider these changes:

- Adding names and contact information for the Program Manager, Program Coordinator, and field staff to Program documentation;
- Clarifying the Administrator and Implementer Staff's reporting structure in the organizational chart; and
- Creating and maintaining a process flow diagram for the Residential Lighting and Appliance Program.

Outcome 7: Although awareness regarding CFLs is very high in Wisconsin, there is a need for continuing consumer education. Customer survey results revealed that the following perceptions may still be market barriers for CFLs: (1) concerns about mercury, (2) difficulty of bulb disposal, and (3) delay that can occur before the lamp achieves full brightness. For these or other reasons, 38% of respondents rated themselves as less than "very likely" to replace their current CFL with another CFL.

Recommendation 5: Continue concentrating the in-store demonstrations on overcoming customers' negative perceptions of CFLs and consider developing additional Program materials about these topics. The Program Implementer should continue to develop educational materials and talking points around addressing concerns about mercury, the ease of bulb disposal, and the bulb's delay in achieving full brightness.

Home Performance with ENERGY STAR Program

The Evaluation Team conducted both an impact evaluation and a process evaluation of the Home Performance with ENERGY STAR Program. The ex post verified gross savings for CY 2012 are 595,415 kWh and 228,621 therms.

A unique aspect of this program is a Project Completion incentive introduced in October 2012 to motivate Trade Allies to complete their projects before the end of the Program year. This is discussed in the Program History and Design section.

M&V Approach

These were the key questions that directed the Evaluation Team's design of the M&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? What are other barriers specific to this Program and segment?
- How is the Program leveraging the current supply chain for Program measures and what changes can increase the supply chain's support of the Program?
- What is customer satisfaction with the Program?

For the impact evaluation, the Team reviewed the Program database and the reported measure-level energy and demand savings. The Team also conducted comprehensive data collection for a sample of participant homes and performed energy simulation based on the field data to assess the EnergyMeasure (EM) HOME savings calculator. (The Implementer utilized this tool to estimate energy savings for the weather-sensitive measures offered by the Program.)

For the process evaluation, the Team focused on activities that assessed the degree to which the Program is operating as planned and implemented. Table 64 lists the evaluation activities and their purposes.

Table 64. Home Performance with ENERGY STAR Program 2012 Evaluation Activities

Activity	Evaluation Area	Completed Sample Size (n)	Absolute Precision at 90% Confidence
Review of the Program Database	Impact	N/A	N/A
On-Site Measurement and Verification	Impact	15	N/A
Engineering Assessment of EM HOME Modeling Software	Impact	N/A	N/A
Stakeholder Interviews[1]	Process	4	N/A
Materials Review	Process	N/A	N/A

[1]Stakeholders interviewed included the Program Administrator's Program Manager and residential segment Manager, and the Program Implementer's Program Manager and Director of Client Services.

Impact Evaluation

Review of Savings Assumptions

The Evaluation Team reviewed the Program tracking database and found no inconsistencies in the data reported in SPECTRUM (such as missing savings values or duplicates of savings associated with the measures installed under the Program). There were rare instances of water heater temperature turn-down and reports of water heater pipe insulation measures that were not on the list of measures defined by the Program; however, the Evaluation Team suspects the latter was a data entry error.

The Home Performance with ENERGY STAR Program offered the following energy-efficiency measures in CY 2012:

- **Direct-Install Measures**
  - Lighting: CFL (9, 14 and 23 Watt)
  - Domestic Hot Water: Faucet Aerator (1.5 gpm, Kitchen and 2 gpm, Bathroom)
  - Domestic Hot Water: Low-Flow Showerhead, 1.5 gpm
- **Non Direct-Install Measure.** Building Shell - Project Completion (Air Sealing and Envelope Insulation)

In the Program database, there were two reports of measure types serving adjustment measures: "Insulation, Project Based, Attic" and "Insulation, Project Based, Wall." These were apparently intended to report bulk-demand savings resulting from the Project completion measure that originally had no demand savings reported.

As shown in Table 65, the evaluation findings for the Home Performance with ENERGY STAR Program resulted in a realization rate of 99% for calendar year 2012. Thus, the gross savings reported in the Program tracking database have been verified as achieved, in accordance with the Program operating criteria and previously agreed upon evaluation criteria.

Table 65. Home Performance With ENERGY STAR Program Realization Rate

Realization Rate
99%

In-Service Rate

The in-service rate (ISR) applied to the Program's direct-install measures is adopted from the Express Energy Efficiency Program ISR values. Those ISR values, which were estimated through conducting a telephone survey of a sample of randomly selected customers, were used because: (1) the two programs had similar participant profiles, and (2) both programs were also implemented by the same Implementer. For the Project Completion measure, the Evaluation Team assigned a 100% rate.

Engineering Assessments

To validate the tracked deemed savings for the Home Performance with ENERGY STAR Program, the Evaluation Team relied primarily on:

- Assumptions from the deemed savings values previously used by the Implementer;
- The Program tracking database, which provides deemed measure-level savings; and
- An assessment of the EM HOME modeling software (by comparing the modeled savings to savings simulated using REM/Rate, developed by Architectural Energy Corporation).

To account accurately for any evolution of the SPECTRUM database system, the Team also coordinated its database assessments with the Program Administrator and the Public Service Commission of Wisconsin.

Assessment of EnergyMeasure Home Savings Calculator

The Program's ex ante energy (kWh and Therms) savings estimates for the Project Completion measure were generated using EnergyMeasure (EM) HOME savings calculator. The Project Completion measure category encompasses air sealing and envelope insulation (attic, wall, foundation and sill box insulation) measure types. To take into account the interactive effect of these weather-sensitive measures, they were bundled as one unit of Project Completion measure per home in terms of reporting the savings in SPECTRUM. All participant homes that had any of these types of measures installed were modeled using this building energy simulation online software.

The Program's ex ante demand (KW) savings for this measure category was calculated exclusively to the EM HOME software, as the EM HOME software does not have sufficient capability to simulate demand savings directly for building shell measures. The Program Implementer used a prescriptive method to claim demand savings for the installed attic and wall insulation measure types. However, no demand savings were claimed for air sealing, foundation, and sill box insulation measure types.

The Project Completion measure accounts for 91% of the total energy savings of the Program. Therefore, the Evaluation Team conducted an extensive technical review of EM HOME savings calculator to ensure that this calculator can estimate savings in future Program years. This effort entailed these activities in CY 2012:

- Reviewing assumptions and inputs informing the tool's savings calculations;
- Collecting pre-measure installation building data through on-site measurement and verification for a sample of 15 Program participating households[31];
- Performing energy simulation based on data collected in the field and using the REM/*Rate* software package[32];

[31] Six of 15 households that originally signed up to participate in Home Performance with ENERGY STAR Program were ultimately redirected to the Assisted Home Performance with ENERGY STAR Program after they were found to be eligible.

- Performing energy simulation using the EnergyMeasure HOME calculator with building and data parameters as similar as possible to each REM/*Rate* model (This ensures that any discrepancy in energy savings is not the result of inputting different values and assumptions.)
- Comparing the percentage of modeled savings from REM/*Rate* to the savings estimated by EnergyMeasure HOME savings calculator; and
- Assessing whether the savings percentage estimates from each modeling package are in alignment.

On-Site Data Collection Procedures

To verify existing (pre-measure installation) building parameters, the Evaluation Team conducted on-site visits at 15 randomly selected households. These households were sampled from among the participating homes that had signed an agreement with the Program Implementer (or the subcontractor) to receive a home energy assessment.

During the on-site visits, the Evaluation Team performed these key activities: (1) evaluated the building enclosure and mechanical systems guided by Building Performance Institute (BPI) standards; and (2) assessed envelope leakage and duct leakage through testing or visual assessment, in accordance with BPI standards. These tests were not conducted in homes where either there was evidence of asbestos or where mold was present or suspected due to the age of the home.[33]

While on site, the Evaluation Team documented these accessible details regarding the home's construction:

- Building footprint dimensions, orientation and area of living space (square footage)
- Construction material type
- Envelope characteristics
- HVAC system type and efficiency rating
- Envelope insulation material and thickness (R-value)
- Window glazing and frame materials

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[32] REM/*Rate* is considered standard energy-modeling software because of its acceptance by The National Mortgage Industry, ENERGY STAR, and RESNET. Additionally, REM/*Rate* is the most widely used new home modeling software.

[33] The Building Performance Institute, Inc. (BPI) Standard Reference: Building Performance Institute Technical Standards for the Building Analyst Professional, v2/28/05mda, Page 1 of 17 (under Health and Safety) states: "Where the presence of asbestos, lead, mold and/or other potentially hazardous material is known or suspected, *all relevant state and federal (EPA) guidelines must be followed to ensure technician and occupant safety.* Blower door depressurization tests may not be performed in homes *where there is a risk of asbestos becoming airborne and being drawn into the dwelling."*

- Window area
- Lighting

REM/*Rate* Energy Modeling

To assign and distribute the measures in a realistic way among the sampled homes, the Evaluation Team interviewed one of the Program Implementer's regional managers. Through this interview, the Team identified the dominant trends in terms of detailed descriptions of installed measures and their frequency. Thus, the measures assigned to these homes were modeled in accordance with these guidelines.

- Typical final (post-measure) R-value for attic insulation is approximately R-50 and is installed on almost all homes that need additional insulation
- Nearly all homes receive air sealing if the house is over the building airflow standard. This measure typically reduces air leakage by more than 50%.
- Approximately 25% of homes have air leakage reduced to below the building airflow standard and have a mechanical ventilation system installed providing flow to a rate that meets ASHRAE 62.2 Standards
- Nearly all homes receive sill box insulation ranging from R13 to R-19, if it is not already installed.
- Approximately 25% of homes in need of wall insulation have R-13 insulation installed.

Based on these guidelines, the Team then calculated for the sample population the percentage of installed measure units.

Two REM/*Rate* building models were developed for each home. The first model simulated the existing (or pre-measure) home's annual energy use, while the second simulated the home's energy use after the installation of the assigned measures. Thus, the energy savings are the difference in annual energy use between the as-built (pre-measure installation) home and the upgraded home.

For the CY 2013 evaluation, the Team will perform site visits to collect post-measure installation data for the 15 homes at which pre-measure data was collected. Collecting these data visits will inform the in-service rate (ISR) for the measures to verify that they were installed per the Program tracking database. The Team will also conduct test-out procedures and measurements to assess duct leakage and envelope leakage.

The Team will assess whether the Program Implementer's inputs into the EM HOME models match the actual building parameters. As appropriate, the Team will recommend updates to the inputs and assumptions so as to improve the tool's accuracy in estimating savings. Additionally, for each measure installed, the Team will compare the demand savings reported by REM/*Rate* to the deemed demand savings claimed and, if needed, will recommend adjusting the deemed savings per the new findings.

Assessment Findings

Regarding the estimates from both the EM HOME and REM/*Rate* models, the electric energy savings estimates are shown in Figure 25 and the gas energy savings are shown in Figure 26.

Electricity

Since most of the homes that were evaluated had natural gas heating systems, the changes in electric energy use due to Program envelope measures were typically the result of changes in air conditioning use, air handler fan operation during heating, and increased use of whole-home mechanical ventilation.

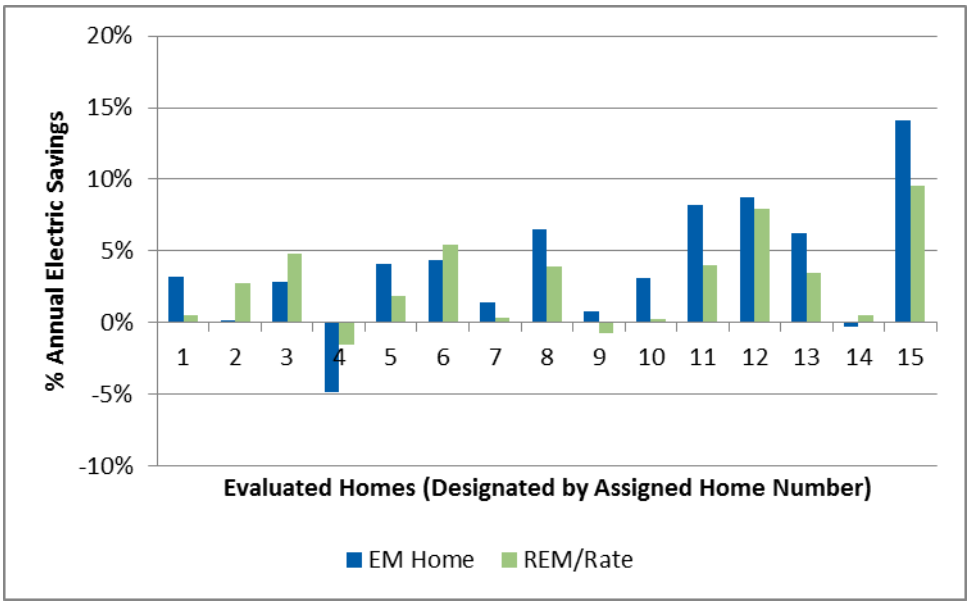
As Figure 25 shows, the electrical savings varied between modeling programs. Since each uses different assumptions for electric usage and occupant behavior patterns, it is difficult to make meaningful usage comparisons. Thus, the Evaluation Team focused on savings resulting from gas heating, as all but one of the evaluated homes used gas as the primary heating fuel.

Due to the addition of whole-home mechanical ventilation systems and other potential interactive modeling effects, some model results showed negative electric savings. For example:

- Homes 2 and 4 were modeled with whole-home mechanical ventilation systems added as part of the improvement package, which caused low to negative electric savings.
- Homes 9 and 14 show negative savings likely due to interactive effects of the heat transfer to air conditioning ducts in the attic and the reduced heat transfer between the house and attic.

In certain instances, some negative savings are likely to occur in the Program when whole-home energy modeling is used.

Figure 25. Percentage Of Electric Savings From Applied Measures

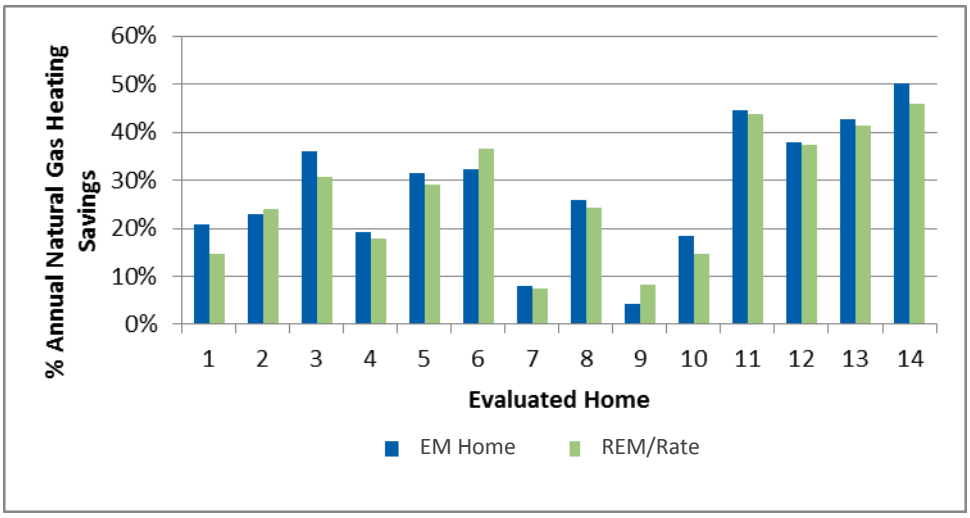


Gas

As Figure 26 shows, the percentages of the annual natural gas savings are closely aligned between the two modeling tools. Previous assessments have shown that REM/*Rate* tends to overestimate heating energy consumption, especially in poorly weatherized homes, and this results in an overestimation of the amount of heating savings. To compare the heating savings reported by REM/*Rate*, the Evaluation

Team reviewed the percentage of annual gas heating savings calculated by each simulation tool for each modeled home. Upon finding that the percentage of gas heating savings is compatible across the two tools, the Team ascertained that the Energy Measure HOME modeling software is an acceptable approach for determining gas savings.

Figure 26. Percentage Of Gas Heating Savings From Applied Measures



Thus, for CY 2013 and CY 2014, the Team recommends continuing to use the EnergyMeasure HOME modeling software to simulate energy savings for the Program's building shell measures.

Gross and Verified Gross Savings

The overall claimed gross and verified gross energy impacts (kWh, KW, and therms) for the Home Performance with ENERGY STAR Program in CY 2012 are shown in Table 66. The Team's analysis is based on the savings documented within the Home Performance with ENERGY STAR Program database and verified against program reporting.

Table 66. Home Performance With ENERGY STAR Program Gross Savings Summary

	Gross			Verified Gross		
	kWh	KW	Therms	kWh	KW	Therms
Annual	608,162	183	229,734	595,415	184	228,621
Lifecycle	5,992,889	183	2,756,813	5,892,001	184	2,743,451

Net-to-Gross Analysis

To derive the evaluated net savings for the Home Performance with ENERGY STAR Program CY 2012, the Evaluation Team applied a 0.85 net-to-gross value (shown in Table 67) to the verified gross savings (In accordance with the evaluation criteria established in the Program-specific evaluation plan and accepted by the Evaluation Work Group and the Public Service Commission of Wisconsin). In future years, as increased participation is expected to be more representative of ongoing program performance, additional evaluation effort will be allocated to assessing the program-specific net-to-gross values.

Table 67. Home Performance With ENERGY STAR Program Net-To-Gross Ratio

Net-To-Gross Ratio
85%

Net Savings

Table 68 lists the verified net energy impacts (kWh, KW, and therms) for the Home Performance with ENERGY STAR Program in CY 2012. The verified net savings are the same as those of the verified gross.

Table 68. Home Performance With ENERGY STAR Program Net Savings

Verified Net			
	kWh	KW	Therms
Annual	506,103	156	194,328
Lifecycle	5,008,201	156	2,331,933

Process Evaluation

The Evaluation Team's process evaluation addressed these key questions:

- What are the objectives and the 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?

Program History and Design

The Home Performance with ENERGY STAR Program has been offered in Wisconsin since 2001. In 2012, the overall Program delivery approach changed from previous years to a contractor (Trade Ally)-driven model in which:

- The customer worked with only one Trade Ally throughout the entire process;
- The Trade Ally conducted the test-out procedure; and
- The Program Implementer conducted quality control inspections of the Trade Allies work.

Previously, the Program used a consultant-driven model, in which the customer typically contacted and interacted with multiple contractors (first to obtain an assessment and then to have the recommended measures installed). The Program Administrator felt that because customers had to make separate appointments with each party, this resulted in: (1) gaps in communication, (2) reduced customer satisfaction issues, and (3) numerous assessments that did not progress to actual projects.

For CY 2012, the Program Administrator and Program Implementer set two objectives and established several design changes to support them:

- Improved customer satisfaction through:
  - Improved participation process efficiency,
  - Incentives being provided to customers more quickly by having them as instant discounts off of the customers' invoice, and
  - Improved communication between the customer and Program (Program Implementer, Trade Allies, and Program Administrator).
- Increased completion or conversion rates and achieving higher savings per home.

Through the Home Performance with ENERGY STAR Program, customers can receive incentive payments totaling 33% of the cost of the air sealing and insulation improvements, up to $1,500. Additionally,

- Participants who achieve household energy consumption savings of 15% over their pre-installation levels are eligible to receive a $200 savings bonus.
- Participants who achieve savings of 25% or better are eligible to receive a $700 savings bonus.

Because the modeling software used by Trade Allies reports costs, savings, and incentives for individual measures and bundled measures, Trade Allies can promote the bonus incentive effectively to customers.

Trade Allies

Trade Allies play a more prominent role in the current Program than they did in the previous Program. Specifically, they are the primary contact for customers, and they have more responsibilities than did the previous participating contractors. Although Trade Allies sometimes subcontract some of the assessment and measure installation work (depending on their own companies' capabilities), they remain responsible for all homeowner interaction, which streamlines the customer's experience.

To participate in the Program, Trade Allies are required to:

- Maintain a specified level of insurance,
- Adhere to safety standards,
- Attend modeling software training conducted by the Program Implementer,
- Follow established installation and material standards, and
- Allow the Program Implementer to conduct quality assurance/ quality control (QA/QC) for their projects.

In addition, the assessments and retrofit work done by Trade Allies (and their subcontractors) need to be completed or verified by a BPI-certified building analyst. The Program Implementer reported that although several tiers of BPI requirements were specified in the initial Program design, these were scaled back for CY 2012 since to facilitate the transition to the new model. This decision was also due to BPI's delay in rolling out additional certifications.

Targeted Customer Segments

While the Home Performance with ENERGY STAR Program is designed to serve all customers who meet the requirements, the marketing and outreach efforts are tailored to specific demographic segments that the Program Implementer feels are most likely to follow through with installations. To identify those segments, the Program Implementer conducted a demographic analysis of past Program participants who completed projects, as compared to those who did not. Based on this analysis, the marketing and outreach efforts are targeted to these customer types:

- "Prosperous and Educated";
- "Retired and Socially Conscious";
- "Living Solo and Making Ends Meet"; and
- "Concerned Moms."

Program Measures

During CY 2012, the Program offered these measures:

- Direct-install measures completed during the assessments, and
- Building shell measures (air sealing and insulation) for:
  - Attics,
  - Exterior walls,
  - Sill boxes, and
  - Foundations.

In October 2012, in an effort to increase Program savings by the end of CY 2012, the Program Implementer added a temporary $100 bonus for applications completed by Trade Allies (with customer signature) by December 15, 2012. By the deadline, 40 of these Project Completion bonuses were paid to Trade Allies.

Program Targets

After lower-than-expected participation early in CY 2012, participation increased significantly as the year progressed. The Program Administrator said that October through February are typically the busiest months for home retrofit projects, but noted the increase in participation was also likely due to additional Program outreach to both customers and Trade Allies.

Program Delivery and Implementation

In CY 2012, the Program implementation and delivery matched the Program design. Both the Program Administrator and Program Implementer reported that the Program delivery model worked well and has continued to improve.

Process Benefits of New Delivery Model

With the new contractor model, Trade Allies are involved in each project from the initial assessment to the completion of installations. (Previously, the customer experience was marred by gaps in communication and lengthy waits for incentives.) Both the Program Administrator and Program

Implementer believe the new delivery model has streamlined the customer's participation experience. The critical results of this improvement are these:

- Higher satisfaction levels among customers and utilities.
- Substantially higher project completion/conversion rates

More Program funds are going directly to energy-saving measures rather than to assessments that do not result in completed projects and the associated energy savings.

Challenges with New Delivery Model

Currently, there are approximately 70 Trade Allies participating in the Program, with the greatest numbers based in the metropolitan areas of Milwaukee, Madison, Fox River Valley (Green Bay to Oshkosh), and Eau Claire.

Although the new Program model involves less work for the customer, it requires more time and coordination on the part of each Trade Ally. This shift in responsibilities requires Trade Allies to do the following:

- Contact subcontractor(s) to complete the assessment and installation work if they cannot do it themselves. (Under the previous model, customers typically had to find subcontractors on their own; now Trade Allies rely on established "delivery teams" of subcontractors.)
- Offer the measure incentives as an instantaneous discount on the invoice and then receive reimbursement from the Program. According to the Program Administrator, this change has improved the customer experience. Note that some Trade Allies were initially hesitant about covering the cost of the incentive, for fear of not being repaid in a timely manner. As CY 2012 progressed and Trade Allies received prompt payment, this ceased to be a key concern.

The Program Implementer attributes the slow start in CY 2012 to the change in Program delivery and the lengthy Trade Ally certification process. In addition to having new Trade Ally processes, such as the use of new modeling software, the revised Program has more structure overall--specifically, standardized reporting, safety guidelines, measures and installation standards, and established quality control process.

While some Trade Allies initially resisted the new standards, the Program Implementer provided the Trade Allies with additional outreach and assistance, including one-on-one training and timely answers to specific questions. The Program Implementer also reduced the BPI certification tiers and imposed fewer requirements regarding Trade Ally participation in the co-operative marketing program. As a result, the Trade Allies' reception of the Program improved throughout the year.

Program Materials

The Evaluation Team reviewed these Program materials:

- Home Performance with ENERGY STAR Operations Manual
- Residential Program Plan

The Team concluded that, overall, these documents provide a comprehensive explanation of the processes for the Program Administrator, Program Implementer, and Trade Allies. The content is concise and relevant, and the process steps are explained sequentially. However, the Team found two areas where information was missing or unclear:[34]

- ***Contact information for key staff or Program resources***, such as the Website address, is missing from the operations manual.
- ***Trade Ally requirements for participation***. The operations manual states that participating contractors must agree to the requirements of both the Trade Ally Application and the Program's Interim Participation Agreement. However, the manual does not explicitly require Trade Allies to complete training sessions on Program processes and software. The Program Implementer has begun clarifying the Program Manual.

Marketing, Outreach, and Training

Marketing Materials

While the Trade Allies have the primary responsibility for marketing the Program, the Program Implementer has additional marketing responsibilities. Specifically, the Program Implementer supports Trade Allies by providing approved marketing pieces and money for cooperative advertising. Through the cooperative advertising component, each Trade Ally can receive up to $3,000 per year in advertising support. As of November 2012, approximately $30,000 of cooperative marketing funding had been distributed to Trade Allies in both the Home Performance with ENERGY STAR Program and the Assisted Home Performance with ENERGY STAR Program. The Program Implementer noted that some Trade Allies prefer to do their own marketing and did not use any of the cooperative marketing support.

The Evaluation Team reviewed the marketing materials—the Program brochures, direct mail pieces, and the Program Marketing Plan—and found that they convey information clearly and concisely, maintain consistent and simple branding, and provide value to the target customers and Trade Allies.

Outreach

The Program's customer educational materials in CY 2012 were Program fact sheets: that included information about the typical problems addressed, and lists of measures and associated incentives. Trade Allies are encouraged to distribute educational materials during assessments and at community events they attend.

The Program Website contains the following:

- A Program summary,
- Detailed information on the incentivized measures,
- A step-by-step summary about participation,

[34] For more information on Program materials, see the Program Materials Review section in Appendix L.

- Trade Ally contact information for customers,
- Program information for Trade Allies, and
- An intake form.

Training

The Program Implementer trains Trade Allies on specific Program requirements and on the modeling software (which has a steep learning curve). For CY 2013, the Program Implementer plans to conduct further software training, in addition to providing training on certain technologies or measures, possibly via Webinars.

In interviews with the Evaluation Team, two Trade Allies reported that Program Implementers' initial and ongoing trainings throughout CY 2012 encouraged their participation and helped them learn the Program's rules and processes. The Trade Allies suggested offering training that would lead to further certification or continuing education credits.

Customer Response

Because CY 2012 was the first year for the redesigned Program, participation rates for customers and Trade Allies were anticipated to be low and not representative of the future years of the Program. Thus, customer surveys for evaluating the Program were deferred until CY 2013. Depending on overall participation numbers, the Evaluation Team plans to survey both Program participants and Program drop-outs in CY 2013.

Trade Ally Response

Because of expectations that only a small population of Trade Allies would complete projects in the first year of the redesigned Program, the Evaluation Team did not plan to speak with Trade Allies for the CY 2012 Evaluation. However, the Team completed in-depth interviews with Assisted Home Performance with ENERGY STAR Trade Allies as part of that Program's evaluation. As those Trade Allies also participated in the CY 2012 Home Performance with ENERGY STAR Program, their feedback has been included in this report.

The Trade Allies interviewed by the Evaluation Team were very satisfied with the CY 2012 Program. While they reported initial hesitation about the design changes affecting both the Home Performance and Assisted Home Performance Programs, they felt that the Program delivery improved throughout CY 2012 and that the Program Implementer was very helpful during the transition.

Program Cost Effectiveness

The benefit cost (B/C) test, also known as a cost-effectiveness test, is used to compare the benefits of a demand side management program with the costs of the program. There are several tests used for evaluating energy efficiency cost-effectiveness. The benefit cost test used in Wisconsin is a modified version of the total resource cost (TRC) test. This test is a commonly administered test for evaluating energy efficiency programs. A description of the test can be found in Appendix H.

The CY 2012 Home Performance with ENERGY STAR Program was found by the Evaluation Team to not be cost effective (the TRC ratio is less than 1). Table 69 below provides the Home Performance with ENERGY STAR Program costs and benefits:

Table 69. Home Performance With ENERGY STAR Program Costs And Benefits

	Home Performance Program
Incentive Costs	$2,434,449
Administration Costs	$444,924
Delivery Costs	$1,014,624
Incremental Measure Costs	$2,728,017
Total Non-Incentive Costs	$4,187,565
Electric Benefits	$419,844
Gas Benefits	$1,162,264
Emissions Benefits	$276,706
Total TRC Benefits	$1,858,815
TRC Net Benefits	($2,328,750)
TRC Ratio	0.44

Evaluation Outcomes and Recommendations

Outcome 1: The Home Performance with ENERGY STAR and the Assisted Home Performance with ENERGY STAR Programs are nearly identical in structure and delivery process. As there are many similarities between the Programs, they likely would benefit from more cross-program collaboration that would likely result in reduced costs and increased efficiencies.

Recommendation 1: To the extent possible, the Program Administrator and Program Implementer should continue to integrate the Assisted Home Performance Program with the Home Performance Program. Processes that will support integration of the two programs should be included in the operations manuals. Although the two Programs have different customer demographics, the delivery, marketing, and tracking efforts could be shared, which would improve the performance without causing disadvantage to either program. By developing a common marketing template and marketing the programs simultaneously, Focus on Energy could capitalize on economies of scale, while Trade Allies to promote both Programs more effectively. Efforts to integrate Programs have begun, and the Implementer indicates they are well underway.

Outcome 2: Challenges arose in the transition from the Legacy Program to the Home Performance and Assisted Home Performance Programs. The CY 2012 Program delivery model was slow to start up, and the discontinuity between the CY 2011 and CY 2012 Programs negatively affected participation. The Program Administrator and Program Implementer also agreed that both the steep learning curve for the new modeling software and the new requirements initially resulted in low Trade Ally satisfaction with and acceptance of the new Program structures. However, the Program Administrator and Program Implementer also reported that as CY 2012 progressed, participation levels increased, as did customer satisfaction and project conversion rates.

Recommendation 2: Continue to increase communication and outreach with Trade Allies and offer more targeted training on the new software and other technical topics. This effort is already underway. The Program should continue to enroll Trade Allies. The Program Implementer should continue to offer specified trainings and develop a reliable method of communication to notify Trade Allies of any Program changes that occur or critical issues that arise throughout the year.

Outcome 3: Trade Allies are not provided with customized marketing materials for distribution to customers, so providing these materials may assist with increasing awareness of the Programs.

Recommendation 3: Develop marketing material templates so that Trade Allies can add their contact information and distribute this in their local region. Having these materials available would help increase awareness of the Program in particular—and energy efficiency in general—among local residents**.**

Assisted Home Performance with ENERGY STAR Program

The Evaluation Team conducted both an impact evaluation and a process evaluation of the Assisted Home Performance with ENERGY STAR Program. The ex post verified gross savings for CY 2012 are 24,565 kWh and 8,715 therms.

M&V Approach

The CY 2012 Assisted Home Performance with ENERGY STAR Program evaluation consisted of process and impact evaluation tasks designed to assess the degree to which the Program is operating as planned and to determine whether any lost opportunities are being minimized. This effort—designed to obtain feedback for the Program Administrator, Public Service Commission of Wisconsin, Program Implementer, and other stakeholders—entailed: a Program and marketing materials review; in-depth interviews with the Program Administrator, Program Implementer, and participating Trade Allies; and a database review (for the impact evaluation). Table 70 lists the evaluation activities.

Table 70. Assisted Home Performance With ENERGY STAR Program 2012 Evaluation Activities

Activity	Evaluation Area	Completed Sample Size (n)	Absolute Precision at 90% Confidence
Review and comparisons of Program databases	Impact	N/A	N/A
Stakeholder Interviews[1]	Process	4	N/A
Materials Review	Process	N/A	N/A
Trade Ally Interviews	Process	2	N/A

[1] Stakeholders interviewed included the Program Administrator's Program Manager and residential segment Manager, and the Program Implementer's Program Manager and Director of Client Services.

Impact Evaluation

The Assisted Home Performance with ENERGY STAR impact evaluation addressed these key researchable questions:

- What are the verified gross and net electric and gas savings?
- How can the Program increase its energy and demand savings?

Evaluation activities that informed the impact findings included a database review, engineering reviews, and a net savings review. Table 71 lists the realization rate for CY 2012.

Table 71. Assisted Home Performance With ENERGY STAR Program Realization Rate

Realization Rate
104%

The Evaluation Team conducted a review of the Assisted Home Performance Program database SPECTRUM, as well as engineering reviews to evaluate the verified gross electric and gas savings.

The results in this CY 2012 Evaluation Report do not include adjustments to deemed assumptions based upon engineering reviews. Recommended adjustments to these values will be entered into SPECTRUM in CY 2013 to take effect beginning on January 1, 2014. When calculating CY 2012 savings, the Evaluation Team applied the previously accepted deemed savings values and algorithms coupled with coupled with verified Program participation and measure in service rate data arrive at the verified measure level savings. As a result, the realization rate (the ratio between the verified savings and the savings contained in the program tracking database) for the majority of measures is 1.0. The exception to this being the Project Completion: Air Sealing & Insulation Measure.

Evaluation of Home Modeling Software

The Team Evaluated the EM Home modeling software for the Home Performance and Assisted Home Performance Program. The Team found EM Home suitable for the Programs tracking. Further detail on EM Home can be found in the Home Performance with ENERGY STAR evaluation section.

Gross and Verified Gross Savings

The CY 2012 Assisted Home Performance Program serviced 45 unique customers and paid out $61,455.44 in incentives (as well as $400 in Application Competition Bonuses). Table 72 lists the total gross and verified gross savings the Assisted Home Performance Program achieved in CY 2012.

Table 72. Assisted Home Performance Program Gross Savings Summary

	Gross			Verified Gross		
	kWh	KW	Therms	kWh	KW	Therms
Annual	25,324	7	8,346	24,565	7	8,715
Lifecycle	223,913	7	100,151	217,994	7	104,579

Net-to-Gross Analysis

The Evaluation Team has experienced that net-to-gross and spillover are not influential factors in similar income eligible programs. For the 2012 impact evaluation, the Evaluation Team accepts a net-to-gross of 1. Consistent with industry best practices the net-to-gross of 1 was proposed and accepted in the Program Specific Evaluation Plan.

Net Savings

Table 73 shows the total net savings for the Assisted Home Performance with ENERGY STAR Program.

Table 73. Assisted Home Performance Program Net Savings

	Verified Net		
	kWh	KW	Therms
Annual	24,565	7	8,715
Lifecycle	217,994	7	104,579

Process Evaluation

The Assisted Home Performance with ENERGY STAR process evaluation addressed these key researchable questions:

- What are the objectives and the 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 to increase the energy and demand savings?
- What are the barriers to increased customer participation, and how effectively does the Program overcome those barriers?
- How do Trade Allies feel about the Program, and are they adequately prepared to face challenges related to Program delivery?

Program Design, History, and Goals

Assisted Home Performance with ENERGY STAR is a market-based 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 Trade Ally 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 an attached home with three or fewer units,
- Heat more than 50% of the home through a participating utility, and
- Have an annual household income that is between 60% and 80% of the State Median Income (SMI).

Further details on the Assisted Home Performance Program design are provided in the Program Descriptions section of this report.

Program History and Design Changes in CY 2012

The previous program, known as Targeted Home Performance, ended early in March 2011 when it was deemed not cost effective by CB&I. Through a competitive Request for Proposals process, CSG became the Program Implementer of Assisted Home Performance with ENERGY STAR Program in April 2012. One of the Program Implementer's first challenges was to change many Trade Allies' and service organizations' perception that the Program did not have available funding in CY 2012.

The Program Implementer changed the overall Program delivery approach from a captive consultant-driven model (individually selected consultants) to a contractor-driven model in which the customer need only contact one Trade Ally throughout the entire process, the Trade Allies conducts the test-out procedure, and the Program Implementer conducts quality control inspections.

In the previous consultant-driven model, the customer typically had to contact and interact with multiple contractors, first to obtain an assessment, and then to have the recommended measures

installed. Because a customer had to make separate appointments with each party, the Program Implementer believed this resulted in gaps in communication, customer satisfaction issues, and many assessments that did not lead to actual projects. For CY 2012, the Program Implementer set two objectives and established several design changes to support them:

- Improved customer satisfaction through:
  - Greater participation process efficiency,
  - More rapid incentive payments, and
  - Better communication between the customer and Program (Program Implementer, Trade Allies, and Program Administrator staff).
- Increased completion or conversion rates, leading to higher savings per home.

Through the Assisted Home Performance with ENERGY STAR Program, customers can receive incentive payments of 75% of the cost of the air sealing and insulation improvements, up to $2,500.

Trade Allies

Trade Allies play a more prominent role in the current Program than they did in the previous Program. Specifically, they facilitate and maintain the primary interaction between the Program and customers, and they have more responsibilities than the previous participating contractors. Although Trade Allies subcontract some of the audit and measure installation work (depending on their own companies' capabilities), they remain responsible for all homeowner interaction, which streamlines the customer's experience.

To participate in the Program, Trade Allies are required to:

- Maintain a specified insurance level,
- Adhere to safety standards,
- Attend modeling software training conducted by the Program Implementer,
- Follow established installation and material standards, and
- Allow the Program Implementer to conduct QA/QC for their projects.

In addition, the audit and retrofit work needs to be completed or verified by a BPI-certified building analyst. The Program Implementer reports that while several tiers of BPI requirements were specified in the initial Program design, these were scaled back for CY 2012 to facilitate the transition to the new model. This decision was also due to BPI's delay in rolling out additional certifications.

Targeted Customer Segments

The Assisted Home Performance with ENERGY STAR Program is designed to serve the income-eligible segment of the population, so marketing and outreach efforts target that audience. However, the Program Implementer is finding this segment difficult to reach through general marketing efforts, and it has enlisted utility assistance to help identify qualifying customers. Customers may include those who receive disability services, are currently in a billing assistance program, or receive assistance through a similar community agency program.

Program Measures

During CY 2012, the Program offered these measures:

- Direct Install measures completed during the assessments, and
- Building shell measures (air Sealing as well as Insulation) for:
  - Attics,
  - Exterior walls,

To increase Program savings by the end of CY 2012, in October the Program added a temporary $100 bonus for applications completed by Trade Allies (with customer signature) by December 15, 2012. The Program paid five completion bonuses to Assisted Home Performance with ENERGY STAR trade Allies during that time period.

Program Delivery and Implementation

The Program Administrator and Program Implementer both reported that although the Program got off to a slow start, the Program delivery model worked well and continued to improve throughout 2012.

Benefits of New Delivery Model

With the new contractor model, Trade Allies are involved in each project from the initial assessment to the completion of installations. Previously, the customer experience was marred by gaps in communication and lengthy waits for rebates. Both the Program Administrator and Program Implementer believe the new delivery model streamlines the customer's participation experience. The critical results of this improvement are these:

- Higher satisfaction levels among customers and utilities.
- Higher audit-to-installation conversion rate
- More Program funds going directly to energy-saving measures rather than to assessments that do not result in project completions and energy savings.

Challenges of New Delivery Model

Although the new Program model involves less work for the customer, it requires more time and coordination on the part of each Trade Ally. Many Trade Allies were resistant to change to the new contractor model. It is the opinion of the Program Implementer that Trade Allies are increasingly satisfied with the new delivery model. This shift in responsibilities requires Trade Allies to do the following:

- Find a subcontractor to complete the audit and installation work if they cannot do it themselves. (Under the previous model, customers typically had to find subcontractors on their own.)
- Offer the measure incentives as an instantaneous rebate on the invoice and then receive reimbursement from the Program Administrator. According to the Program Administrator, this change has improved the customer experience.
- Some Trade Allies were initially hesitant about covering the cost of the incentive, for fear of not being repaid in a timely manner. As CY 2012 progressed and Trade Allies received prompt payment, this ceased to be a key concern.

The Program Administrator and Program Implementer gave two reasons for the Program's slow start:

- The previous Program had ended early, so customers, Trade Allies, and local service organizations believed there was no CY 2012 budget for the Assisted Home Performance with ENERGY STAR Program.
- There is a lengthy Trade Ally certification process. The new Program requires Trade Allies to use new modeling software and to follow standardized reporting and safety guidelines.

While some Trade Allies initially resisted the Program's new standards, the Program Implementer provided them with additional outreach and assistance, including one-on-one training and timely answers to specific questions. The Program Implementer also scaled back BPI certification tiers and imposed fewer requirements around Trade Ally participation in the cooperative marketing program. As a result, Trade Allies' reception of the Program improved throughout the year.

Program Materials

The Evaluation Team reviewed these Program materials: (1) Assisted Home Performance with ENERGY STAR Operations Manual, and (2) Mass Markets Program Plan. The Team concluded that, overall, these documents provided a comprehensive explanation of Program processes for the Program Administrator, Program Implementer, and Trade Allies. The documents are concise and relevant, and outline the Program processes sequentially. However, the Team identified three areas where information was missing or unclear[35]:

- ***Missing contact information for key staff or Program resources.*** Staff contact information and other information such as the Website address, are not included in the Operations Manual.
- ***Trade Ally requirements for participation.*** The Operations Manual states that participating Trade Allies must agree to the requirements of both the Trade Ally Application and the Program's Interim Participation Agreement, but does not explicitly require the Trade Allies to complete training sessions on Program processes and software. The Program Implementer has begun clarifying the Program Manual.
- ***The incentive payment process is not clearly defined.*** The Operations Manual provides inconsistent descriptions of how the Program processes incentives: one description says the incentive is paid directly to the customer as an instant rebate, with Program later reimbursing the Trade ally; the other says customers will receive a check in the mail once work has been completed. The Program Implementer has begun clarifying the Program Manual.

Marketing, Outreach, and Training

Marketing Materials

While the Trade Allies had the primary responsibility for marketing the CY 2012 Program, the Program Implementer provided marketing assistance. The Program Administrator provided approved marketing pieces and offered cooperative advertising financial support. Through the cooperative advertising component, each Trade Ally could receive up to $3,000 per year in advertising support. As of November 2012, approximately $30,000 of cooperative marketing funding had been distributed to Trade Allies in both the Home Performance with ENERGY STAR Program and Assisted Home Performance with ENERGY STAR Program. The Program Implementer indicated most of the Assisted Home Performance Trade Allies also participate in the Home Performance Program, making the cooperative marketing funding hard to divide in tracking between the Programs.

The Program Implementer said that the high level of cooperative advertising support in CY 2012 was to assist Trade Allies as they accustomed themselves to the new implementation model. The Program Implementer also noted that not all Trade Allies take advantage of the marketing assistance and financial support; some Trade Allies prefer to market on their own.

[35] For more information on Program materials, see the Program Materials Review section of Appendix L.

The Evaluation Team reviewed the marketing materials—the Program brochures, direct mail pieces, and the Program Marketing Plan—and found them successful in conveying information clearly and concisely, maintaining consistent and simple branding, and providing value to the target customers and Trade Allies.

Outreach

The educational materials distributed to customers during CY 2012 consisted of fact sheets and Program flyers covering the Program overall, typical house problems that could be addressed through the Program, and lists of measures and rebates available to customers.

The Focus on Energy Website contains the following:

- A summary of the Assisted Home Performance with ENERGY STAR Program,
- Detailed information on the rebated measures,
- A step-by-step summary about Program participation,
- Trade Ally contact information for customers,
- Program information for Trade Allies,
- A Program intake form, and
- The income-verification form

Trade Allies are encouraged to distribute additional educational materials when doing an assessment, as well as at community events they attend. Focus on Energy also works with community organizations to distribute educational materials to customers who might be good candidates for the Program.

Training

The Program Implementer's Trade Ally training tended to focus on specific Program requirements and the modeling software, as the latter had a steep learning curve. The Program Implementer offered multiple training sessions on various Program-related topics throughout CY 2012. In CY 2013, the Program Implementer plans to conduct further training on the software, in addition to training on certain technologies or measures, possibly via Webinars.

The Evaluation Team interviewed two Trade Allies, who reported that Program Implementer's training sessions encouraged their participation and helped them learn the Program's rules and processes. Both Trade Allies suggested the Program Implementer offer training that would lead to further certification or continuing education credits.

Customer Response

Because of the Program's relatively low CY 2012 participation, the Evaluation Team and Program Administrator decided not to conduct any CY 2012 customer surveys. The CY 2013 Evaluation will include both Program participant and Program drop-out surveys, given sufficient participation numbers.

Trade Ally Response

Few participating Trade Allies completed Assisted Home Performance with ENERGY STAR Program projects in 2012. The Program Implementer provided contact information for the four Trade Allies who had completed CY 2012 projects, but only two responded to the Evaluation Team for an in-depth interview. (The Evaluation Team tried to contact all four Trade Allies via both e-mail and telephone between January 29, 2013, and February 12, 2013.) As mentioned in the Home Performance with ENERGY STAR Program section the Programs should continue to enroll more Trade Allies.

The Trade Allies interviewed by the Evaluation Team are very satisfied with the CY 2012 Program. While they reported initial hesitation about the Program design changes, they felt that Program delivery continued to improve throughout CY 2012 and that the Program Implementer was very helpful during the transition.

The Trade Allies interviewed said they were not provided with marketing materials ready to distribute to customers. After participating in the cooperative marketing program, these Trade Allies said their effort to increase awareness among local residents would have been helped by having marketing material templates available for printing into which they could add their contact information.

Program Cost Effectiveness

The benefit cost (B/C) test, also known as a cost-effectiveness test, is used to compare the benefits of a demand side management program with the costs of the program. There are several tests used for evaluating energy efficiency cost-effectiveness. The benefit cost test used in Wisconsin is a modified version of the total resource cost (TRC) test. This test is a commonly administered test for evaluating energy efficiency programs. A description of the test can be found in Appendix H.

The CY 2012 Assisted Home Performance Program was not found by the Evaluation Team to be cost effective (the TRC ratio is less than 1). Table 74 below provides the Assisted Home Performance Program costs and benefits:

Table 74. Assisted Home Performance Program Costs And Benefits

	Assisted Home Performance Program
Incentive Costs	$60,439
Administration Costs	$107,100
Delivery Costs	$244,236
Incremental Measure Costs	$65,557
Total Non-Incentive Costs	$416,894
Electric Benefits	$6,815
Gas Benefits	$36,664
Emissions Benefits	$9,551.30
Total TRC Benefits	$53,030
TRC Net Benefits	($363,864)
TRC Ratio	0.13

Outcomes and Recommendations

Outcome 1: The Assisted Home Performance and the Home Performance Programs are almost identical in structure and delivery process. There are many similarities between the Programs and they likely would benefit from more cross-program collaboration.

Recommendation 1: To the extent possible the Program Administrator and Program Implementer should continue to integrate the Assisted Home Performance and Home Performance Programs. Processes to ensure Program integration should be included in the operations manuals. Although the two Programs have different customer demographics; delivery, marketing, and tracking efforts should be shared between the two Programs to improve the Programs' performance and not disadvantage one another. Marketing both programs simultaneously and developing marketing templates specific to these Programs capitalizes on economies of scale and enables Trade Allies to more effectively promote both Programs. Efforts to integrate Programs have begun and the Implementer indicates they are well underway.

Outcome 2: Challenges arose in the transition from the Legacy Program to the Home Performance and Assisted Home Performance Programs. The CY 2012 Program delivery model was slow to start up, and the discontinuity between the CY 2011 and CY 2012 Programs negatively affected participation. The Program Administrator and Program Implementer agreed that both the steep learning curve for the new modeling software and the new requirements initially resulted in low Trade Ally satisfaction with and acceptance of the new Program structures. This impeded Program start-up and hindered overall Program participation. However, the Program Administrator and Program Implementer also reported that as CY 2012 progressed, participation levels increased, as did customer satisfaction and project conversion rates.

Recommendation 2: Continue to increase communication and outreach with Trade Allies, and offer more targeted training on the new software and other technical topics. This effort is already underway. The Program should continue to enroll Trade Allies. The Program Implementer should continue to offer specified trainings and develop a reliable method of communication to notify Trade Allies of any Program changes that occur or critical issues that arise throughout the year.

Outcome 3: Trade Allies are not provided with customized marketing materials ready to distribute to customers and providing these materials may assist with increasing awareness of the programs.

Recommendation 3: Develop marketing material templates so that Trade Allies can add their contact information and distribute this in their local region. Having these materials available would help increase awareness of the Program in particular—and energy efficiency in general—among local residents**.**

New Homes Program

The Evaluation Team conducted both an impact evaluation and a process evaluation of the New Homes Program. The ex post verified total gross savings for CY 2012 are 2,920,383 kWh and 568,854 therms.

M&V Approach

These were the key questions that directed the Evaluation Team's design of the M&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? What are other barriers specific to this Program and segment?
- How is the Program leveraging the current supply chain for Program 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 the activities listed in Table 75 to obtain multiple perspectives in the assessment of the Program's CY 2012 performance.

Table 75. New Homes Program CY 2012 Evaluation Activities

Activity	Evaluation Area	Completed Sample Size (n)	Absolute Precision at 90% Confidence[1]
Review and comparisons of Program databases	Impact	N/A	N/A
Stakeholder Interviews[2]	Process	4	N/A
Materials Review	Process	N/A	N/A

[1]Maximum absolute precision at 90% confidence is indicated only for activities designed to collect data that are statistically representative of the population. No precision level is associated with activities collecting anecdotal information not intended to represent any population.

[2] Stakeholders interviewed included the Program Administrator's Program Manager and residential segment Manager, and the Program Implementer's Program Manager and Director of Client Services.

During CY 2012, New Homes Program builders constructed homes to one of four incentive levels that would achieve energy savings beyond the requirements of the Wisconsin Uniform Dwelling Code (UDC). The Wisconsin UDC is similar to the 2006 International Energy Conservation Code with certain, more stringent, energy standards specific to the state. For a home to achieve an energy-efficiency designation of better than UDC:

- The expected savings must be confirmed by building simulation modeling and performance testing;
- The builder must install specific technology packages (listed below) in addition to achieving the energy efficiency levels, specified in Table 76.

Table 76. Incentives and Technology Packages

Incentive Levels	Technology Package	Incentive A: Electric & Natural Gas	Incentive B: Electric Only
Level 1 (10%-19.9% better than UDC)	None required	$200	$100
Level 2 (20%-29.9% better than UDC)	Any 2 required	$750	$200
Level 3 (30-39.9% better than UDC)	Any 3 required	$1,000	$300
Level 4[2](40% or more better than UDC)	Any 3 required plus a renewable energy technology and HRV or ERV[1]	$1,500	$400

[1]HRV: Heat recovery ventilator; ERV: enthalpy recovery ventilator.

[2]In July, the requirement increased to 4 technology packages and no longer specified renewable energy technologies.

The energy efficiency technology packages are:

- *Lighting:* ENERGY STAR-Qualified Light Bulbs
- *Lighting:* ENERGY STAR-Qualified Light Fixtures
- *Building Shell:* Energy-Efficient Windows
- *Building Shell:* Exterior Above-Grade Wall Insulation: R5 or Greater
- *Building Shell:* Rim and Band Joist Spray Foam Insulation
- *Space Heating:* Furnace with an ECM: 90% AFUE or Greater
- *Space Heating:* Gas Boiler: 90% AFUE or Greater
- *Water Heating:* Indirect Water Heater
- *Water Heating:* Tankless (0.82 EF or Greater)
- *Water Heating:* Storage. Power Vented (0.67 EF or Greater)
- *Water Heating:* Storage. Condensing (90% TE or Greater)
- *Water Heating:* Storage. Electric (0.93 EF or Greater)

The renewable energy technology packages are:

- Ground Source Heat Pumps
- Solar Water Heating
- Solar Photovoltaic

Impact Evaluation

Tracking Database Review

The Evaluation Team reviewed the Program tracking databases—SPECTRUM, the Program Implementer's internal database, and 2012 legacy data. From this review, the Team determined that all participating homes met the minimum requirements for both the percentage of savings and the number of measure packages for the applicable certification level.

Table 77 lists the participation for each certification level and for each measure package in CY 2012.

Table 77. Packages Adopted By Certified New Homes

Measure Category	Measure	Level 1	Level 2	Level 3	Level 4	Total
Lighting	Light Bulbs	0	346	48	8	402
Lighting	Light Fixtures	0	6	4	0	10
Building Shell	Windows	0	4	4	5	13
Building Shell	Wall Insulation	0	255	58	9	322
Building Shell	Rim and Band Joist Insulation	0	516	86	7	609
Space Heating	Furnace	0	83	49	1	133
Space Heating	Gas Boiler	0	3	5	2	10
Water Heater	Indirect	0	1	6	1	8
Water Heater	Tankless	0	9	5	0	14
Water Heater	Storage Power Vented	0	584	55	2	641
Water Heater	Storage Condensing	0	2	7	0	9
Water Heater	Storage Electric	0	0	0	0	0
Renewable Energy	Ground Source Heat Pumps	1	2	6	0	9
Renewable Energy	Solar Water Heating	0	0	4	5	9
Renewable Energy	Solar Photovoltaic	0	2	3	8	13

In CY 2012, the most popular technology packages of the New Homes Program were these:

- Power vented storage water heaters,
- Rim and joist spray insulation,
- CFLs,
- Wall insulation, and
- Furnaces.

All other technologies had very low (less than 1%) adoption rates. The Program Implementer noted that because water heater requirements had changed for CY 2013, the water heating technology packages are likely to be less popular in the future.

Forecasts of the participation share for each certification level—which are listed in Table 78—proved highly accurate in CY 2012.

Table 78. New Homes Program Participation By Level (Through November 30, 2012)

Certification Levels	Forecast	Actual
Level 1 (10%-19.9% better than Code)	32%	37%
Level 2 (20%-29.9% better than Code)	57%	56%
Level 3 (30-39.9% better than Code)	10%	7%
Level 4 (40% or more better than Code)	1%	1%

In the SPECTRUM database, savings were 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 renewable energy measures that were incentivized in addition to the home certifications were the exception to this limitation; however, because so few renewable energy measures were installed through the Program in CY 2012, they were not evaluated separately.

All of the gross savings reported in the program tracking databases were verified to have been achieved, in accordance with the program operating criteria and previously agreed-upon evaluation criteria. Thus, as - shown in Table 79, the evaluation findings for the New Homes Program resulted in a realization rate of 100% for CY 2012.

Table 79. New Homes Program Realization Rate

Realization Rate
100%

Note that the current practice of reporting savings at the home level does not facilitate an analysis of which measures are providing the most savings. The savings are also assigned the same lifetime, although there are different lifetimes for the mix of technologies offered. Furthermore, SPECTRUM does not contain all of the homes certified by the Program in 2012. There were 228 homes tracked in a legacy database that had to be appended to the SPECTRUM database for this review. While it appears these participating homes are being claimed by the New Homes Program, it is unclear if they will appear in SPECTRUM for future reporting.

Engineering Assessments

This Program Implementer's database tracks results from the certification work done by on-site 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.

The Evaluation Team found very high correlation between savings reported in SPECTRUM and the savings reported by the Program Implementer's tracking system. However, there was low correlation for homes that used Liquid Propane (LP) for heating fuel. Because SPECTRUM only reports electricity and natural gas savings, the savings from efficient homes heated with LP are not captured. Consequently, some 3,000 MMBtu of fossil fuel savings are not accounted for in SPECTRUM (approximately 4% of annual Program savings).

The software that models energy use is REM/Rate, developed by Architectural Energy Corporation. 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 advisor to create special baseline models and reporting tools in REM/Rate.

The Evaluation Team interviewed the Program's technical advisor and did a primary review of the specialized New Homes Program reports built into REM/Rate. Based on the review and the established credibility of REM/Rate software, the Evaluation Team found sufficient evidence for using this software as a savings calculator and certification tool for the New Homes Program.

Gross and Verified Gross Savings

Table 80 shows the overall tracked gross and verified gross energy impacts (kWh, KW, and therms) for the New Homes Program in CY 2012. These results, which were based on the savings documented within the Program databases, were verified against Program reporting:

Table 80. New Homes Program Gross Savings Summary

	Gross			Verified Gross		
	kWh	KW	Therms	kWh	KW	Therms
Annual	2,920,383	677	568,854	2,920,383	677	568,854
Lifecycle	87,611,490	677	17,065,620	87,611,502	677	17,065,628

Net-to-Gross Analysis

In accordance with the evaluation criteria established in the Program-specific evaluation plan (and accepted by the Evaluation Work Group and the Public Service Commission of Wisconsin), the Evaluation Team applied a 0.85 net-to-gross value, shown in Table 81 to the verified gross savings to determine the evaluated net savings. In future years, as increased participation is expected to be more representative of ongoing Program performance, the Team will assess the Program-specific net-to-gross values.

Table 81. New Homes Program Net-To-Gross Ratio

Net-To-Gross Ratio
85%

Net Savings

Table 82 lists the Program's verified net energy impacts (kWh, KW, and therms) for CY 2012. The savings are "net" of what would have occurred in the Program's absence.

Table 82. New Homes Program Net Savings

Verified Net			
	kWh	KW	Therms
Annual	2,482,326	575	483,526
Lifecycle	74,469,777	575	14,505,784

Process Evaluation

The process evaluation for the New Homes Program addressed these key questions:

- How effective is the New Homes Program at achieving its target goals?
- How can the New Homes Program increase its energy and demand savings?
- Is the marketing strategy effective?
- How does the Program encourage participation, and what changes can increase Program awareness?
- What is the level of customer satisfaction with the Program?

Program History and Designs

The New Homes Program has been a part of Focus on Energy's residential segment offerings since 2001. Over the past several years, the national downturn in residential new construction has had a negative impact on the Wisconsin housing industry; however, the Program Implementer observed that home construction is again increasing in Wisconsin.

Through a re-bid process, the incumbent Program Implementer was selected and was contracted by the Program Administrator on July 1, 2012 to continue providing services.

In CY 2012, there were two key changes to the New Homes Program: the modified treatment of renewable energy measures and the adjustment of water heater eligibility requirements. Specifically, the Program Implementer added stricter water heater efficiency factors to reflect industry and ENERGY STAR standards. In addition, a new system for tracking participation and other Program information was rolled out in 2012. The transfer of records from the old database to the new system (SPECTRUM) occurred during CY 2012.

The Program Implementer reported that shifting to the SPECTRUM database was more time consuming, staff-intensive, and costly than anticipated. Thus, administrative funds that the Program Implementer would have preferred to dedicate to marketing and outreach were spent on the new database.

Program Delivery and Implementation

Approximately 40 building performance consultants (BPCs) and more than 200 builders were active in the CY 2012 New Homes Program. Builders and BPCs work together to deliver the Program in this way:

- BPCs recruit and develop partnerships with builders, providing education on how to build homes that qualify for the Program and how to meet the Program requirements.
- Builders market the Program by working directly with homebuyers who wish to purchase energy-efficient homes.

The Program Implementer reported that the builder-BPC partnership provides value and establishes credibility with the builders because BPCs often offer construction consultation services beyond what the Program requires.

In 2012, the Program Implementer reported that some builders and BPCs had challenges with the Trade Ally application process. In certain instances they were asked to fill out applications multiple times, either because the document was lost or incomplete.

Marketing, Outreach and Training

Marketing Materials

The New Homes Program uses two types of marketing materials—those that target builders and those that target homebuyers.

Materials for Homebuyers

The Evaluation Team found that most of the Program's online information and educational print materials target homebuyers. These materials are written clearly and concisely, with branding conveyed simply. The benefits of a Focus on Energy home are presented to homebuyers in terms of greater comfort, lower ownership costs, and the satisfaction to be found in buying a third-party certified energy-efficient home.

The Program Implementer would like to dedicate more funds to marketing and to develop better tools to inform homebuyers of the New Homes Program. One example of this would be to include case studies or advertisements noting the successes of top builders in publications such as *Badger Builder*. A number of other Residential New Construction programs feature builders in outreach materials and provide case studies that feature satisfied homebuyers.

Materials for Builders

The Evaluation Team reviewed the materials—currently a Website and a brochure- used to educate builders about, and encourage participation in, the New Homes Program. The Program Implementer also offers a cooperative advertising reimbursement to builders but, to date, fewer builders than anticipated have requested this reimbursement. The Program Implementer speculated that the low acceptance rate of this option is because: (1) builders may perceive that obtaining reimbursement requires too much effort; and (2) typically, builders' marketing efforts are not planned far enough in advance to coordinate with the Program Implementer on advertising. The Program Implementer would like a better understanding of why builders are not using this incentive.

Special Mortgages for Energy-Efficient Homes

North Shore Bank partnered with the New Homes Program to provide financing benefits for energy-efficient construction beginning in 2011. For purchasers throughout the state, North Shore offers a reduced down payment and a reduced interest rate, and will accept a higher debt-to-income ratio. North Shore markets and promotes the New Homes Program; however, at this time, the Program Implementer does not receive reliable tracking data from the bank on mortgages procured in association with the Program. In CY 2012, North Shore Bank issued approximately 25 New Homes Program mortgages.

Outreach

The New Homes Program outreach strategy followed these steps in CY 2012:

1. The BPCs recruited builders.
2. The Builders then marketed the Program to home buyers.

This outreach strategy has proven effective, and the Program consistently met its participation goals over the past few years. The Program Implementer reports that in CY 2012, the Program has a sufficient number of BPCs working in coordination with the more than 200 builders in the state. The Program Implementer did not describe any problems with insufficient BPC coverage statewide.

Thus far, the direct contact between Administrator and Implementer Staff and customers is limited to attending home builder events and local home shows.

The Program Implementer noted that, at this time, the Program does not reach out to or provide any marketing materials for realtors and appraisers, although these entities play an influential role in the home purchase process.

The Program Implementer estimated that the Program comprises from 25% to 30% of the new home market statewide. By reviewing census data, the Evaluation Team determined that the Program's participation market share is in the lower range (22%) of the Program Implementer's estimate.[36] While Program homes are built throughout the state, most have been built in the more populous areas, such as in and around Milwaukee, Madison, and Green Bay.

Among builders, the Program Implementer reported that awareness is high. Both historically and currently, the Program has also had success in partnering with homebuilder associations. Although the Program reaches out to all builders, large-volume builders have typically expressed greater interest in participating. Furthermore, large-volume builders are able to increase market penetration more cost-effectively by building large communities in metropolitan areas. All large-volume builders in the state (as identified by the Program Implementer) participate, and some builders participate with 100% of their homes.

The New Homes Program maintains partnerships with all twenty five Home Builders Associations throughout the state. The Program leverages these memberships to market the program directly to the builder members of each association by offering educational sessions regarding building science and the advantages of participating in the program.

Training

With the Program Implementer in attendance, all BPCs undergo field certifications at a minimum of three test homes. Then, within their first year, BCPs must complete two more home certifications under the mentoring of the Program Implementer.

Most of this mentoring was done several years ago, and there has been little turnover of BPCs during the past few years. No budget was allocated CY 2012 for training additional BPCs, but as the Program continues to grow, the Program Implementer and Program Administrator anticipate needing to recruit and train new BPCs (and, thus, to begin offering field certifications again).

A key benefit of having skilled BPCs is that they introduce builders to techniques and measures. All BPCs are Residential Energy Services Network (RESNET) certified, which means they must meet specific

[36] 2012 Wisconsin housing start data from the Federal Reserve Bank of St. Louis: Housing Units Authorized by Building Permits (Seasonally Adjusted Census data), Privately Owned Housing Starts Authorized by Building Permits: 1-Unit Structures for Wisconsin, Series ID: WIBP1FHSA. Found at: http://research.stlouisfed.org/fred2/release?rid=246&soid=4.

continuing-education requirements. The Program Implementer provides continuing training, which facilitates the monitoring of BPC credentials. BPCs also receive continual technical and programmatic support from the Program Implementer.

Customer Response

For CY 2012, an online survey was provided to every Program home buyer. Although the survey is optional, most home buyers participate in it. However, this survey provided only limited insights about a customer's level of Program awareness and homeowner satisfaction.

Trade Ally Response

Builder comments received by the Program Implementer suggest that the New Homes Program's greatest value is that it helps develop better builders in Wisconsin. Much of the Program's accomplishments to date can be attributed to a strong working relationship between the Program builders and BPCs.

Both the Program Implementer and the builders remain current on Wisconsin building code changes, and neither anticipates code changes in the near future. In other states, changing building codes often present challenges to energy-efficiency program participation; however, this is not the case in Wisconsin.

Program Cost Effectiveness

The benefit cost (B/C) test, also known as a cost-effectiveness test, is used to compare the benefits of a demand side management program with the costs of the program. There are several tests used for evaluating energy efficiency cost-effectiveness. The benefit cost test used in Wisconsin is a modified version of the total resource cost (TRC) test. This test is a commonly administered test for evaluating energy efficiency programs. A description of the test can be found in Appendix H.

The CY 2012 New Homes Program was found by the Evaluation Team to be cost effective (a TRC ratio above 1). Table 83 below provides the New Homes Program costs and benefits:

Table 83. New Homes Costs And Benefits

	New Homes Program
Incentive Costs	$970,050
Administration Costs	$313,548
Delivery Costs	$715,030
Incremental Measure Costs	$4,798,235
Total Non-Incentive Costs	$5,826,813
Electric Benefits	$4,024,689
Gas Benefits	$10,477,967
Emissions Benefits	$3,020,408
Total TRC Benefits	$17,523,064
TRC Net Benefits	$11,696,250
TRC Ratio	3.01

Evaluation Outcomes and Recommendations

Outcome 1. The New Homes Program is tracked in two databases. Having two databases doubles the data entry effort and increases the risk of errors.

Recommendation 1. Consolidate all of the Program tracking into SPECTRUM (adding total home use, percentage of code, and other relevant data).

Outcome 2. While the Program Implementer anticipates the number of participating BPCs is sufficient to meet the quadrennial Program needs, the Program Administrator and Implementer anticipates needing to recruit and train additional BPCs to match market activity. In CY 2012, the Program budget did not include training new BPCs because most of the BPCs had been trained in previous years. While neither the Program Implementer nor the Program Administrator anticipate needing to recruit new BPCs at this time, the increased activity in the building market could trigger the need for more BPCs. Should that occur, the Program Implementer will need to begin offering field certifications again.

Recommendation 2. Ensure adequate materials and budget are available for BPC and builder training needs to match market activity. The Program Implementer should develop BPC and builder training materials to prepare for future training needs, as Program goals increase and/or new opportunities in the market develop. Also, during BCP recruitment, the Program Implementer should examine the distribution of BPCs statewide and focus on areas where Program expansion is most desirable.

Outcome 3. The New Homes Program operations manual presents a comprehensive, detailed overview of the Program's internal processes; however, it is an internal document that lacks critical information about processes for external audiences (specifically, for builders and homebuyers). Furthermore, because the operations manual is used as a training document for Administrator and Implementer Staff members, it should contain contact information, additional resources, and staff roles. (Note that similar state and utility training documents for residential new construction programs contain contact information, additional resources, and staff roles.)

Recommendation 3. Consider developing a manual for BPCs that includes the following information currently omitted from the operations manual:

- Specific builder eligibility requirements;
- Contact information for key staff;
- Program process steps outlined in the manual;[37]
- Clearly defined Administrator and Implementer Staff roles; and
- Clearly detailed process for resolution of QA/QC and verification issues.

[37] While every home is built on a different timeline, Administrator and Program Implementer Staff may benefit from having estimates of when to anticipate certain milestones.

Outcome 4. Although the New Homes Program achieved its CY 2012 goals, it will likely be necessary to expand marketing efforts when Program goals increase. Having only limited insight into the motivations and demographics of potential customers limits the ability to provide effective outreach to new home buyers. The CY 2012 administrative funds were unexpectedly needed for updating and using SPECTRUM, so budget was not available for a comprehensive marketing effort. Because so many builders have been recruited statewide, shifting the marketing focus toward home buyers will generate demand for energy-efficient homes. Additionally, the cooperative advertising reimbursement offered to builders has very low participation, despite offering a generous incentive.

Recommendation 4. Increase the Program marketing and outreach. Ensure that the CY 2013 implementation budget accommodates additional marketing efforts that include advertisements, online marketing, and events. The following actions may help expand Program awareness and participation:

- Develop metrics to track the success of marketing efforts and use a free, simple analytics tool (such as Google Analytics) to track online Program metrics.
- Develop a Trade Ally recognition event each year. Recognize builders and BPCs for their Program achievements beyond simply the largest volume; and/or include builders and BPCs in a Focus on Energy recognition event.
- Showcase the New Homes Program in key publications such as *Badger Builder*.
- Initiate relationships with real estate professionals (such as appraisers and realtors) to educate this important stakeholder group in the home purchase process. These efforts could open a new line of communication with those directly involved with home buyers and could initiate conversations about the value of a Program home.
- Expand partnerships with lenders (such as North Shore Bank) and request that the lenders provide quarterly updates on loans made through the Program so that the Program Implementer can track the popularity of this service.
- Explore (through an online survey or one-on-one conversations) why the cooperative advertising feature is not attractive to builders. If the incentive is not attractive for reasons that cannot be changed, consider redirecting incentive monies into existing New Homes Program incentives.[38]

[38] The Evaluation Team will explore this issue via builder surveys during the CY 2013 evaluation.

Residential Rewards Program

The Evaluation Team conducted both an impact evaluation and a process evaluation of the Residential Rewards Program. The ex post verified gross savings for CY 2012 energy efficiency measures are 7,730,760 kWh and 1,093,316 therms. The ex post verified gross savings for CY 2012 renewable measures are 730,323 kWh and 705 therms. The ex post verified total gross savings for CY 2012 measures are 8,461,083 kWh and 1,094,021 therms.

M&V Approach

These were the key questions that directed the Evaluation Team's design of the M&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? What are other barriers specific to this Program and Segment?
- How is the Program leveraging the current supply chain for Program 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 the activities listed in Table 84 to obtain multiple perspectives in the assessment of the Program's CY 2012 performance.

Table 84. Residential Rewards Data Collection Activities And Sample Sizes

Activity	Description	Evaluation Area	Completed Sample Size (n)
Stakeholder Interviews[1]	Insights into design and delivery. Process-related issues, including program management, marketing and outreach, and data tracking	Process	3
Participating Contractor Interviews[2]	Program satisfaction, Focus on Energy awareness, marketing and communication methods, and Program suggestions.	Process	10
Nonparticipating Contractor Interviews[3]	Program and Focus on Energy awareness and participation decisions	Process	10
Materials Review	Completeness and alignment with industry best practices	Process	N/A
Engineering Reviews	Review of measure level savings and assumptions	Impact	N/A

[1.] Stakeholders interviewed included the Program Administrator's Program Manager and residential segment Manager, and the Program Implementer's Program Manager.

[2.] Participants were defined as contractors who may or may not have been registered Trade Allies but who participated in the Residential Rewards Program in CY 2012. All 10 interviewed contractors were registered Trade Allies. All 10 offered heating and air conditioning services. Five of the ten also offered water heating services. Two offered renewable services in addition to heating and air conditioning and water heating services.

[3.] Nonparticipants were defined as contractors who were not registered Trade Allies and did not participate in the Residential Rewards Program in CY 2012.

Impact Evaluation

The Team's impact evaluation of the Residential Rewards Program addressed these key questions:

- What are the verified gross electric and gas savings?
- What are the verified net electric and gas savings?

Table 85 provides the realization rates for CY 2012.

Table 85. Residential Rewards Program Realization Rate

Measure Type	Realization Rate
Energy Efficiency	100%
Renewable Energy	99%
Total[1]	100%

[1]Overall realization rate is 99.99%

Tracking Database Review

The Evaluation Team conducted a database review to determine which variables should be tracked in SPECTRUM to enable precise engineering reviews of the deemed savings. The Evaluation Team found that most of the data that would support engineering reviews of the rebated renewable and energy

efficiency measures exists only on photocopied application forms—or data do not exist at all. Manually entering data from PDFs is highly inefficient, so the Team strongly recommends that SPECTRUM track specific measure information electronically.

Gross and Verified Gross Savings Analysis

To evaluate the verified gross electric and gas savings, the Evaluation Team reviewed the Program database and conducted engineering reviews. Although the results in the CY 2012 evaluation report do not include the adjustments from the engineering reviews, the Team used deemed assumptions, algorithms, and Program data to verify the measure level savings. The results in this CY 2012 Evaluation Report do not include adjustments to deemed assumptions based upon engineering reviews. Recommended adjustments to these values will be entered into SPECTRUM in CY 2013 to take effect beginning on January 1, 2014. When calculating CY 2012 savings, the Evaluation Team applied the previously accepted deemed savings values and algorithms coupled with coupled with verified Program participation and measure in service rate data arrive at the verified measure level savings. As a result, the realization rate (the ratio between the verified savings and the savings contained in the program tracking database) for the majority of measures is 1.0. Most measures received the same unit energy savings as reported; however the Team updated the verified unit energy savings for photovoltaics (PV). The changes are explained below.

Photovoltaics

Using the Program Administrator's deemed savings algorithms; the Evaluation Team recalculated the electric savings from the solar PV records and found that one record over-reported savings. The Team adjusted the electric unit energy savings accordingly.

The Team also removed all gas savings from the verified unit savings, as the deemed information provided by the Program Administrator provided no evidence for any gas savings for these measures. (Two solar PV records had reported gas savings.)

Metering of ECM Furnaces

In February 2012, the Evaluation Team installed 30 meters on ECM furnaces, with the primary goal to measure the use of the ECM blowers. To capture the entire 2012-2013 heating season, these meters must remain installed until the end of March 2013. Thus, the results are not available for the CY 2012 Evaluation Report. However, the Evaluation Team will submit an interim memo in June 2013 that contains the findings of the study. In autumn 2013, 60 meters will be installed and the final results will be available in 2015.

Gross and Verified Gross Savings

Table 86 lists the total gross savings and verified gross savings, by measure type, achieved through the Residential Rewards Program in CY 2012.

Table 86. Residential Rewards Program Gross Savings Summary

Measure Type		Gross			Verified Gross		
		kWh	KW	Therms	kWh	KW	Therms
Energy Efficiency	Annual	7,730,760	2,747	1,093,316	7,730,760	2,747	1,093,316
	Lifecycle	177,800,775	2,747	24,652,207	177,800,775	2,747	24,652,207
Renewable Energy	Annual	730,570	183	863	730,323	183	705
	Lifecycle	14,611,407	183	17,268	14,606,454	183	14,108
Total	Annual	8,461,331	2,929	1,094,179	8,461,083	2,929	1,094,021
	Lifecycle	192,412,182	2,929	24,669,475	192,407,228	2,929	24,666,315

Net-to-Gross Analysis

The evaluation plan for the Residential Rewards Program stated that the Evaluation Team planned to use the Standard Market Practice (SMP) method to calculate net savings. This design relied on the completion of the baseline study; however, that study was not available for the CY 2012 evaluation report.

As an alternative to the SMP method, the Evaluation Team reviewed the net-to-gross ratios from the planning assumptions and from the 2010 Focus on Energy evaluation, which enabled the Team to identify the most appropriate net-to-gross values for each measure. (This methodology was described in an attachment to the Program Specific Evaluation Plan.) Table 87 lists the various net-to-gross ratios by measure.

Table 87. Residential Rewards Program Net-To-Gross Ratios

Measure Type	Measure Category	Measure Name	Net-To-Gross Ratio	Source
Energy Efficiency	Boiler	Condensing Water Heater, NG, 90%+	85%	Planning Assumptions
	Boiler	Hot Water Boiler, 90%+ AFUE	85%	Planning Assumptions
	Boiler	Hot Water Boiler, 95%+ AFUE	65%	Planning Assumptions
	Furnace	LP or Oil Furnace with ECM, 90%+ AFUE (Existing)	38%	Planning Assumptions
	Furnace	NG Furnace with ECM, 90%+ AFUE (Existing)	38%	2010 Focus on Energy Evaluation
	Furnace	Natural Gas Furnace with ECM, 95%+ AFUE (Existing)[1]	85%	Evaluation Team
	Furnace	NG Furnace with ECM, 95%+ AFUE (Existing)[1]	85%	Evaluation Team
	Water Heater	Tankless Water Heater, NG, EF of 0.82 or greater	80%	Planning Assumptions
	Water Heater	Water Heater, Electric, EF of 0.93 or greater	80%	Planning Assumptions
	Water Heater	Water Heater, Indirect	80%	Planning Assumptions
	Water Heater	Water Heater, NG, EF of 0.67 or greater	80%	Planning Assumptions
Renewable Energy	Geothermal	Ground Source Heat Pump, Electric Back-up	80%	Planning Assumptions
	Geothermal	Ground Source Heat Pump, NG Back-up	80%	Planning Assumptions
	Photovoltaics	Solar PV	82%	Planning Assumptions
	Solar Thermal	Solar Thermal, Electric	58%	2010 Focus on Energy Evaluation
	Solar Thermal	Solar Thermal, NG	33%	2010 Focus on Energy Evaluation

[1] The Evaluation Team contacted three participating trade allies and asked how influential the program was on customers' decisions to purchase 95%+ AFUE furnaces over 90%+ AFUE. All trade allies reported that the program was highly influential, and hence the Evaluation Team assigned a higher net-to-gross of 85% instead of the 38% from planning assumptions or the 50% from the 2010 Focus on Energy Evaluation.

Net Savings

Table 88 lists the total net savings for the Residential Rewards Program.

Table 88. Residential Rewards Program Net Savings

Measure Type		Verified Net		
		kWh	KW	Therms
Energy Efficiency	Annual	6,211,020	2,211	912,239
	Lifecycle	142,849,029	2,211	20,614,835
Renewable Energy	Annual	590,954	149	415
	Lifecycle	11,819,072	149	8,296
Total	Annual	6,801,974	2,361	912,654
	Lifecycle	154,668,101	2,361	20,623,131

Process Evaluation

The process evaluation for the Residential Rewards Program addressed these key questions:

- What is the Program process (for example: how does it deliver services to customers)?
- Are key staff roles clearly defined?
- 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 Program measures, and what changes could increase the supply chain's support of the Program?
- What is customer satisfaction with the Program?

Program History and Design

Launched on January 1, 2012, the Residential Rewards Program replaced the Energy Efficient Heating and Cooling Incentive (ECHI) Program (a Legacy Program that operated until the end of 2011) for residential space and water heater prescriptive incentives (rewards). The Program Administrator said that the Energy Efficient Heating and Cooling Incentive Program was successful and that it provided a foundation for the Residential Rewards Program design.

To avoid market disruptions, the Program Administrator and Program Implementer designed the Residential Rewards Program to maintain a measure mix and reward amounts that were similar to the Energy Efficient Heating and Cooling Incentive Program. However, the following elements were also incorporated in the Program:

- High-efficiency space and water heating measures with larger reward amounts were added to further market transformation.
- Rewards were offered beginning July 2012 for these following renewable energy measures: solar electric, solar water heating, and ground source heat pumps.

Marketing and outreach was oriented toward Trade Allies rather than directly to customers, in recognition that customers typically contact Trade Allies before searching for rewards from Focus on Energy.

The Program Implementer found no barriers to implementation, reporting a smooth transition between the CY 2011 and CY 2012 Programs. The Program Implementer attributed the Program's success to its design, which minimized change and aligned the Program elements with the legacy ECHI Program.

The Program Administrator said that the Program's high rate of participation means that Trade Allies and other market actors are actively engaged with the Program, probably because of their existing familiarity with the legacy ECHI Program.

The Evaluation Team's interviews with 10 participating Trade Allies supported these statements, as nine of the 10 Trade Allies interviewed reported first learning of the Program when they participated in the ECHI Program.

Program Delivery and Implementation

An interested customer participates in the Program by working with a contractor or registered Trade Ally to install energy-efficient equipment (and/or renewable equipment). Following the purchase and installation of the equipment, the customer works with the contractor or Trade Ally to complete the reward application(s), attach the invoice, and send the application(s) to the Program Implementer.

The Program Implementer's goal is to process each application(s) within seven business days, which entails validating the application(s) for completeness and for customer and equipment eligibility. The process encompasses data entry and quality control before the application(s) is submitted to the Program Administrator for payment approval. The Program Implementer also is responsible for marketing, outreach, and management of a call center for this specific Program.

The Program Administrator is responsible for overall Program management and coordination with other residential offerings.

The Program Implementer and the Program Administrator said that the application(s) paperwork is the challenge most commonly reported by participating customers and Trade Allies, although only one application is required. The Program Administrator said that both customer and Trade Ally feedback indicates that an online application would be a positive change.

Of the 10 Trade Allies interviewed by the Evaluation Team, only one said the paperwork was a challenge. Furthermore, none of the 10 nonparticipating contractors interviewed said that the paperwork influenced their decision not to participate. However, seven Trade Allies did mention that their customers struggled with the paperwork. These Trade Allies reported that some customers were unable to get the paperwork in within the deadline, while others submitted paperwork without proper documentation (such as the invoice or account number). These challenges often resulted in customers reaching out to the Trade Ally about their application(s) denial or rebate status. Therefore, three of the Trade Allies said they mail the paperwork for the customer to make sure the application(s) is submitted properly and on time.

The Program budget was sufficient for CY 2012 Program implementation, and both the Program Implementer and the Program Administrator reported that the current process works well. Both also said they share a good working relationship.

Program Materials

Overall, the Evaluation Team found that the Residential Rewards Program's operations manual provided a comprehensive explanation of the processes for the Program Administrator and Program Implementer. The manual's content is concise, and it provides clear steps and checkpoints for reward

processing. However, the manual does not inform internal staff members about the steps or checkpoints that customers or Trade Allies must complete before submitting their applications.

Describing to staff the activities of customers and Trade Allies before submitting their applications, could provide information such as how often customers are contacted. Also, the operations manual could include details such as how customers learn of the Program, when customers initially reach out to Trade Allies to install the measure, or what assistance Trade Allies provide when helping customers complete the paperwork for the incentive.

The Evaluation Team found that the Program Implementer's Trade Ally outreach materials provide clear Program information, including customer eligibility requirements. Although the applications contain information about the processing timeframe, the content specific to Trade Allies in the outreach materials does not mention the time typically required to process an application, review a project, or process the reward. Appendix L provides further detail on the Evaluation Team's materials review.

Marketing, Outreach, and Training

Marketing Materials

The Program Implementer followed the Residential Rewards Program marketing plan for creating Website content and Program fact sheets. The renewable measures are marketed separately to customers from the space and water-heating measures, with separate factsheets for each. Depending on the measure the customer intends to install, the renewable rewards and the space and water heating rewards are offered through separate Webpages and separate applications.

To market the Program, the Program Implementer used e-mail blasts, social media, and direct mailings. While the Program Implementer said that all marketing tactics have been effective, the most-effective tactic has been the direct marketing to Trade Allies. The least successful tactic, according to the Program Implementer, has been outreach to local community groups because customers do not generally turn to these groups first for information about replacing space and water heating equipment.

Trade Allies are encouraged to market the Program to customers, and seven of the 10 Trade Allies interviewed by the Evaluation Team said they did so. Among those seven, three Trade Allies reported using Focus on Energy marketing materials. All of the interviewees said they inform their eligible customers about the Program when customers contact them for services.

The Evaluation Team asked the participating Trade Allies to specify the most successful and least successful marketing tactics, based on customer feedback (Table 89). The Trade Allies interviewed said social media was the least effective tactic, with one Trade Ally stating many of his clients do not use social media.

Table 89. Participating Trade Ally Reports Of Successful Marketing Tactics (N=10)

Marketing Tactics	Number of Respondents Mentioning Tactic
Website	2
Trade Allies	2
Online ad	1
Utility bill insert	1
Word-of-mouth	1
Don't know/No answer	3

Outreach

To meet the CY 2012 goal of increasing Trade Ally outreach, the Program Implementer used four outreach associates strategically located throughout Wisconsin. These associates relied on contact lists from sources in the supply chain (such as manufacturers and distributors) to identify the potential Trade Allies they should contact. In addition, the Program Implementer maintains an activity report to monitor projects completed by registered Trade Allies. The outreach strategies worked, as the Program Implementer reported a "significant increase" in Trade Ally enrollment over the last six months of CY 2012.

Seven of the 10 Trade Allies interviewed said they decided to participate in the Program because Focus on Energy invited them to do so. One Trade Ally said that Focus on Energy does a great job with Trade Ally outreach.

Training

The Program Implementer provides staff with training materials, such as call center scripts, reference sheets, frequently asked questions and answers, lists of eligible utilities and rewards, and SPECTRUM database guidelines.

For Trade Allies, the Program offered an optional Webinar about Program requirements and reward amounts, which five of the 10 interviewed Trade Allies attended. The Trade Allies interviewed did not suggest additional trainings be offered, stating the Webinar and Website provide them with enough Program information.

Customer Response

The Evaluation Team did not conduct customer surveys for the CY 2012 Residential Rewards Program evaluation. However, the Program Administrator, the Program Implementer, and the interviewed Trade Allies reported that customer feedback has been primarily positive, with statements such as, "*The Program is awesome,*" and "*People love it.*" Still, the Trade Allies also reported hearing customer concerns about the length of time for rebate processing.

To assess customer satisfaction and potential barriers, the Evaluation Team will conduct customer surveys for the CY 2013 Program evaluation.

Trade Ally Response[39]

All of the participating Trade Allies interviewed by the Evaluation Team rated themselves as were "*very satisfied*" (n=8) or "*somewhat satisfied*" (n=2) with their relationship with Focus on Energy, offering feedback such as, "*It's great,*" and "*They do a very good job.*"

Regarding their participation in the Program, the majority of Trade Allies were satisfied, as shown in Table 90.

Table 90. Participating Trade Ally Reports Of Program Satisfaction (N=10)

Rating	Number of Respondents
Very satisfied	7
Somewhat satisfied	2
Not too satisfied	1

The Trade Ally who described himself as "*not too satisfied*" said that the Program had too much paperwork and that Trade Allies do not receive any reward for participating. One Trade Ally described himself as only "*somewhat satisfied*" because the rebate processing is lengthy and he receives calls from customers asking about their reward status.

When the Team asked the Trade Allies how helpful the Focus on Energy affiliation is for their business, the responses were mixed, as shown in Table 91.

Table 91. Participating Trade Ally Perception Of Focus On Energy Affiliation (N=10)

Rating	Number of Respondents
Very helpful	3
Somewhat helpful	3
Not too helpful	3
Not at all helpful	1

Some Trade Allies provided positive feedback on the Program, such as, "*The Website is a great source of information,*" and "*Continue the Program as long as possible.*"

Trade Allies also offered several suggestions for the Program:

- Shorten the rebate processing time (n=3);
- Simplify the application and increase the reward amount for the ground-source heat pump (n=1);

[39] Due to the small sample size, the Evaluation Team presents anecdotal information on CY 2012 Trade Ally response, but will evaluate Trade Ally response in greater detail in CY 2013.

- Create a library of training materials and webinars specific to each Program on the Website (n=1);
- Allow Trade Allies to invoice the reward so customers can see the it reflected in the purchase price (n=1); and

Provide at least 30 days' notice of any Program reward changes, so Trade Allies can include the correct reward level in their bids on jobs (n=1).

In addition to interviewing 10 participating Trade Allies, the Team interviewed 10 nonparticipating contractors, all of whom were familiar with the Program. When the Evaluation Team asked these contractors why they decided not to participate in the Program, their responses included: (1) an overwhelming current workload without Program work, (2) no customer interest, (3) the measures sold are at a lower efficiency level than required for the Program, (4) their business was closing, and (5) geographic limitations.

Program Cost Effectiveness

The benefit cost (B/C) test, also known as a cost-effectiveness test, is used to compare the benefits of a demand side management program with the costs of the program. There are several tests used for evaluating energy efficiency cost-effectiveness. The benefit cost test used in Wisconsin is a modified version of the total resource cost (TRC) test. This test is a commonly administered test for evaluating energy efficiency programs. A description of the test can be found in Appendix H.

The CY 2012 Residential Rewards Program was found by the Evaluation Team to be cost effective (a TRC ratio above 1). Table 92 below provides the Residential Rewards Program costs and benefits:

Table 92. Residential Rewards Program Costs And Benefits

	Residential Rewards Program
Incentive Costs	$3,937,558
Administration Costs	$673,316
Delivery Costs	$1,535,462
Incremental Measure Costs	$15,348,786
Total Non-Incentive Costs	$17,557,564
Electric Benefits	$11,921,705
Gas Benefits	$16,491,191
Emissions Benefits	$6,053,405
Total TRC Benefits	$34,466,301
TRC Net Benefits	$16,908,738
TRC Ratio	1.96

Evaluation Outcomes and Recommendations

Outcome 1. The Residential Rewards Program had a strong year in CY 2012, exceeding its overall Program annual energy and demand savings goals; however, the renewables component fell short of its renewable energy goals. The Program added renewable energy measures July 1 of CY 2012 and

established third-quarter and fourth-quarter goals for these measures; however, the goals were not met.

Recommendation 1. Explore ways to improve participation levels in the renewables component. Consider conducting targeted outreach for renewable measures. Also, ensure that adequate informational and marketing resources about renewable measures are available to Trade Allies.

Outcome 2. The Evaluation Team's materials review found that the Program marketing materials and Website provided clear, relevant Program information, but found room for improvement in the operations manual and Trade Ally outreach materials. The Trade Ally outreach materials and tactics were informative, and they contributed to the increase in Trade Ally registration and participation. However, these materials did not provide information regarding the processing time for applications and rewards. The operations manual provided clear and concise steps for reward processing, but it did not specify for internal staff reference the process steps followed by customers and Trade Allies before they submit an application.

Recommendation 2. For internal staff, update the operations manual with details regarding the initial process steps and checkpoints customers and Trade Allies complete before they submit an application. For Trade Allies, develop materials that specify the expectations for and time estimates for application review and reward processing.

Outcome 3. The Program has resulted in high satisfaction from participants, but reported challenges with application paperwork could diminish satisfaction among Trade Allies and participants. Trade Allies reported high satisfaction with the Program, and both the Program Administrator and the Program Implementer have gathered positive feedback from customers. However, both the Program Administrator and the Program Implementer reported complaints from customers and Trade Allies about the amount of paperwork. Although only one interviewed Trade Ally said he found the application paperwork challenging, seven Trade Allies reported that their customers had difficulties with completing and submitting the application. In addition, Trade Allies said the lengthy processing time for rebates resulted in customers contacting them to confirm the status of their rebates. Therefore, three participating Trade Allies said they submitted the reward application on behalf of their customers to ensure the application is submitted on time and with correct information.

Recommendation 3. Provide an online application. Offering customers an online application will: (1) increase the ease of application submission for Trade Allies and customers, (2) enable customers to make more timely application submissions, and (3) reduce data transcription errors.

Outcome 4. Most of the data that would support engineering reviews of the rebated measures exists only on photocopied application forms, or does not exist at all. Manually entering data from PDFs is highly inefficient.

Recommendation 4. Electronically track specific measure information. Table 93 lists the variables necessary to evaluate the measure level savings for the Residential Rewards Program measures. These variables should be collected on applications and tracked electronically in SPECTRUM.[40]

Table 93. Recommended Variables To Track

Measure Type	Measures	Recommended Variables
Energy Efficiency	Boilers	Heating capacity AFUE Make and model number
	Furnaces	Heating capacity AFUE Make and model number
	Tankless Water Heater	Energy factor Make and model number
	Domestic Hot Water Heater (electric & gas)	Energy factor Volume Make and model number
	Indirect Domestic Hot Water Heater	Standby losses Volume AFUE of boilers Make and model number
	Condensing Water Heater	Thermal efficiency Standby losses Make and model number
Renewable Energy	Ground Source Heat Pumps	Cooling capacity heating capacity EER cooling COP heating Make and model number
	Solar PV	Tilt Azimuth Shading Nameplate capacity
	Solar Hot Water Heaters	Tilt Azimuth Shading Make and model number

[40] Recommendations apply only to the listed measures, as the team will review the remaining measures in the CY 2013 Evaluation Report.

Express Energy Efficiency Program

The Evaluation Team conducted both an impact evaluation and a process evaluation of the Express Energy Efficiency Program. The ex post verified gross savings for CY 2012 measures are 4,723,787 kWh and 556,774 therms.

Under the Express Energy Efficiency Program, eligible homeowners were offered direct installations of lighting and domestic hot water measures—at no cost to the homeowner—to increase the energy efficiency of their homes. During CY 2012, there were approximately 136,390 energy-efficiency measures directly installed that contributed to the Program's gas energy savings, electric energy savings, and electricity demand savings.

The Express Energy Efficiency Program offered these direct-install measures in CY 2012:

- *Lighting : CFL (9, 14, 19 and 23 Watt)*
- *Domestic Hot Water: Faucet Aerator*
- *Domestic Hot Water: Low-Flow Showerhead*
- *Domestic Hot Water: Water Heater Pipe Insulation*
- *Domestic Hot Water: Water Heater Temperature Turn-Down (about 10 F degrees)*

M&V Approach

These were the key questions that directed the Evaluation Team's design of the M&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? What are other barriers specific to this Program and Segment?
- How is the Program leveraging the current supply chain for Program 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 the activities listed in Table 94 to obtain multiple perspectives in the assessment of the Program's CY 2012 performance.

Table 94. CY 2012 Express Energy Efficiency Evaluation Activities

Activity	Evaluation Area	Completed Sample Size (n)	Absolute Precision at 90% Confidence[1]
Program Database Review	Impact	N/A	N/A
Participant Surveys	Impact and Process	29	+/- 9.2%
Nonparticipant (Drop-out) Surveys[2]	Process	14	+/- 12.3%
Stakeholder Interviews[3]	Process	3	N/A
Field Technician Interviews[4]	Process	7	N/A
Community Partner Interviews[5]	Process	10	N/A
Materials Review	Process	N/A	N/A

[1] Maximum absolute precision at 90% confidence is indicated only for activities designed to collect data that are statistically representative of the population. No precision level is associated with activities collecting anecdotal information not intended to represent any population.

[2.] Nonparticipants were defined as customers who scheduled a visit but then cancelled their appointment.

[3.] Stakeholders interviewed included the Program Administrator's Program Manager and residential segment Manager, and the Program Implementer's Program Manager.

[4.] Field Technicians were employees of the Program Implementer.

[5.] Community Partners were utilities and community-based organizations that partnered with the Program Implementer to market the Program.

Impact Evaluation

Tracking Database Review

The Evaluation Team's review of the Program tracking database revealed no discrepancies in the data, no missing savings values, and no duplicates of savings associated with the measures installed under the Program.

In the Program database there were also six Adjustment Measures intended to correct the amount of previously reported deemed demand savings.

For each measure that was direct-installed through the Express Energy Efficiency Program in 2012, total ex ante savings were estimated using prescriptive method and on a measure-level basis. Total verified energy (kWh and Therms) savings and total peak demand (kW) savings are determined as a product of the number of measures verified as being installed and the deemed savings per measure. The method used to determine verified installations is described in the Verification of Number of Measures Installed section.

The Program offered direct installation of two kinds of faucet aerators in kitchens and bathrooms. These high-efficiency aerators, which have flow rates of 1.5 gpm (kitchen) and 1 gpm (bathroom), replaced older units of an equivalent type and saved both gas and electric energy depending on the fuel type of the water heater and by reducing the household's domestic hot water consumption.

The Program also offered direct installation of low-flow showerheads, replacing units of equivalent kind. The new showerhead has a rated flow of 1.5 gallons per minute (gpm) and saved both gas and electric energy depending on the fuel type of the water heater and by reducing the household's domestic hot water consumption.

Under the Program, water heater pipe insulation was offered to reduce heat loss from the pipes attached to the water heater resulting in gas and electricity energy savings.

The Program also offered the residents the option to have the installer turn down the temperature of their water heater. This saves energy because it takes less energy to heat water to a lower temperature and to maintain that temperature.

Verification of Number of Measures Installed (In-Service Rate)

To verify the percentage of direct-install measures that were installed and still in use, also referred to as In-Service Rate (IRS) through the Express Energy Efficiency Program in 2012, the Team conducted a telephone survey of a randomly selected sample of 29 households that participated in the 2012 Program.

The ISR survey asked the respondents whether the reported measure units are installed and still in-use. As a result, the ISR percentages for the Program's measures are estimated at:

- Lighting (CFL): 96%
- Faucet Aerators: 89%
- Low-Flow Showerheads: 93%
- Water Heater Pipe Insulation: 100%
- Temperature Turn-downs on Water Heaters: 75%

The gross savings reported in the Program tracking database have been verified, in accordance with the Program operating criteria and previously agreed upon evaluation criteria. The 7% variance between the ex ante and the ex post savings is due to applying the in-service rate to the energy savings associated with each measure type. As shown in Table 95, the evaluation findings for the Express Energy Efficiency Program resulted in a realization rate of 93% for CY 2012.

Table 95. Express Energy Efficiency Program Realization Rate

Realization Rate
93%

Engineering Assessments

To validate the tracked deemed savings for the Express Energy Efficiency Program, the Evaluation Team relied primarily on:

- Assumptions from the deemed savings values previously used by the Program Implementer
- The Program tracking database, which provides deemed measure-level savings

To account accurately for any evolution of the SPECTRUM database system, the Evaluation Team coordinated database assessments with the Program Administrator and the Public Service Commission of Wisconsin.

Gross and Verified Gross Savings

The overall claimed gross and verified gross energy impacts (kWh, KW, and therms) for the Program in CY 2012 is shown in Table 96. These results are based on the savings documented in the Program database and verified against Program reporting.

Table 96. Express Energy Efficiency Program Gross Savings Summary

	Gross			Verified Gross		
	kWh	KW	Therms	kWh	KW	Therms
Annual	4,944,651	427	603,179	4,723,787	388	556,774
Lifecycle	35,165,039	427	7,238,152	33,456,393	388	6,681,284

Net-to-Gross Analysis

In accordance with the evaluation criteria established in the Program-specific evaluation plan (and accepted by the Evaluation Work Group and the Public Service Commission of Wisconsin), the Evaluation Team applied a 0.85 net-to-gross value, shown in Table 97) to the verified gross savings to derive the evaluated net savings for the Express Energy Efficiency Program in CY 2012. As Program participation increases, participation is expected to be more representative of ongoing Program performance, so the Team will re-assess the Program-specific net-to-gross values.

Table 97. Express Energy Efficiency Program Net-To-Gross Ratio

Net-To-Gross Ratio
85%

Net Savings

Table 98 lists verified net energy impacts (kWh, KW, and therms) for the Express Energy Efficiency Program in CY 2012.

Table 98. Express Energy Efficiency Program Net Savings

	Verified Net		
	kWh	KW	Therms
Annual	4,015,219	330	473,258
Lifecycle	28,437,934	330	5,679,092

Process Evaluation

The process evaluation for the Express Energy Efficiency Program addressed these key questions:

- What is the Program process (for example: how does it deliver services to customers), and how well is it working?
- Are key staff roles clearly defined?

- Is the Program implementation plan well-documented and consistent?
- How can the Program be improved so as to increase the energy and demand savings?

Program Design, History, and Goals

Launched in April 2012, the Express Energy Efficiency Program is designed so that eligible households may participate (once per cycle) during the three-year Program cycle (CY 2012-2014). The Program will be offered to residential customers of participating utilities on a city-by-city basis, so that site visits can be consolidated geographically. The Program Implementer's schedule defines the primary, secondary, and "outlying" areas to be reached in each calendar year. However, the Program manual makes an allowance for communities that may request to participate at a time other than their scheduled time.

As designed by the Program Implementer and Program Administrator, Express Energy Efficiency Program provides instant savings by having trained technicians install low-cost energy-efficiency measures in residential homes. In CY 2012, these measures were offered:

- CFLs (up to 12),
- Faucet aerators and low-flow showerheads (no limit),
- Water heater pipe insulation (up to six feet), and
- A setback on the water heater temperature.

The field technicians also worked to increase customer awareness of other Focus on Energy programs by showing customers possible energy-efficiency opportunities encountered in their homes and distributing literature about Focus on Energy programs that addressed the customer's particular needs.

Most installation work was performed by field technicians employed by the Program Implementer. To accommodate demand, however, the Program Implementer subcontracted some of the installations. According to the Program implementer, approximately five of 25 communities were managed by subcontractors, representing approximately 10% of total participants.

Outreach was conducted jointly with a cooperating local utility, wherever possible. If utilities declined to participate, the Program Implementer found other local partners, such as local government or local sustainability-related non-profit organizations. All Program outreach was done via utility bill inserts or other mailings, or through public events.

Program Goals

The Express Energy Efficiency Program had two goals: (1) achieve energy and demand savings, and (2) raise customer awareness of and participation in other programs. The Program Administrator established seven additional goals as key program performance indicators:

- Timelines, quality and accuracy for reporting and contracts,
- Call center metrics,
- Complaint resolution,
- Customer satisfaction,

- Incentive processing and invoices,
- Homes served, and
- Measures installed.

The Evaluation Team obtained quantitative data on two of those goals: the number of homes served and the number of measures installed. Table 99 shows Program performance for these two key indicators in CY 2012.

Table 99. Program Performance Against Key Indicators

	Homes Served	CFLs Installed per Home	Domestic Hot Water Measures Installed per Home
2012 Target	10,714	9.7	2.63
2012 Actual	9,855	9.6	4.2
% of Target	92%	99%	161%[1]

[1] Domestic hot water (DHW) measure count includes all showerheads, faucet aerators, pipe insulation, and a reduction in water heater temperature

The Program Administrator also set the targets for demand and energy savings. However, the Program Implementer reported that lower-than-expected electricity savings occurred in CY 2012, primarily as the result of fewer-than-expected participating houses having electric water heaters.

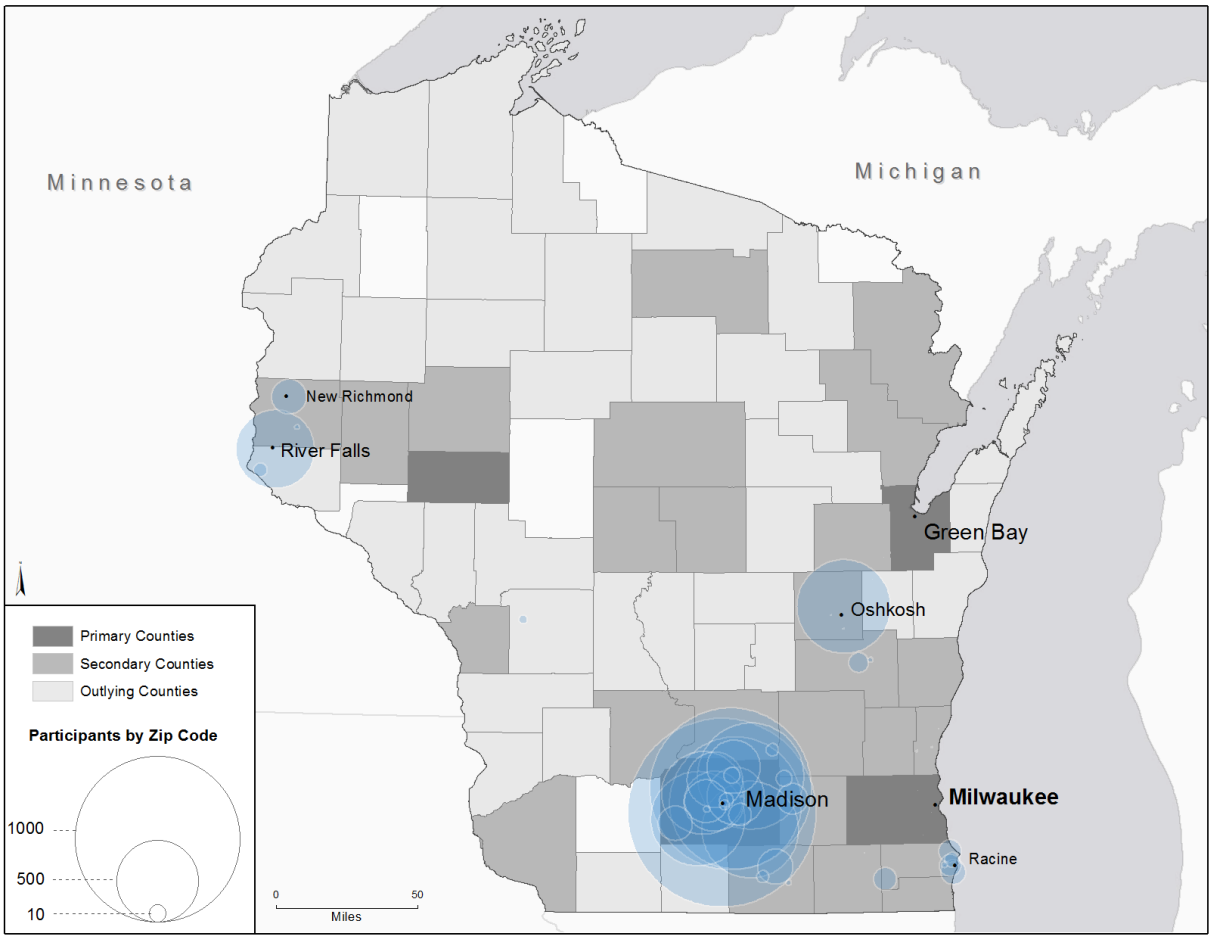
The Program Administrator, the Program Implementer, Program partners, and the customers surveyed by the Evaluation Team reported that the basic program design elements worked well in CY 2012. The Program Implementer noted some minor issues (related to outreach, available technicians, and data entry) and identified possible solutions that will be implemented for CY 2013. These possible solutions are discussed in detail below.

Program Delivery and Implementation

The Program's first year of implementation went smoothly. The Program Implementer completed nearly 9,900 installation visits in 25 communities and supplied households with over 136,000 individual measures. All of the stakeholders—customers, cooperating utilities and community organizations, the Program Implementer, and the Program Administrator—reported that the Program encountered few operational difficulties in CY 2012.

Figure 27 shows the geographic distribution of CY 2012 participants by ZIP code, as well as the category of primary, secondary, or outlying area for each county. During CY 2012, the Program reached those counties designated as either primary or secondary.

Figure 27. CY 2012 Express Energy Efficiency Participants By ZIP Code



Neither community partners nor the Program Implementer reported having difficulty procuring measures for installation. Field technicians, customers, and community partners noted a few incidents of customer dissatisfaction with light bulbs or other measures. When these incidents occurred, the field technicians revisited those homes and either replaced the original materials or provided the customer with new materials.

The process for scheduling an appointment appears to be effective. The Program Implementer used their internal call center and the website for scheduling visits, completed by their own employees. Depending on the size of the community, subcontractors handled their own scheduling or relied on the Program Implementer call center. For both systems, customers register their name, utility and phone number on the phone or via an online form, and then receive a call back from the scheduler. This approach worked well, although one community partner mentioned that a resident was startled to note that the scheduling company had an out-of state phone number. Also, two field technicians said that on

a few occasions, they discovered the homes they visited were wholly or partially ineligible.[41] Typically, the eligibility issues were the result of the home being part of a building with too many units or because the home used propane for fuel. In these situations, the customers were not aware they were ineligible.

All of the 10 community partners interviewed (whether from utilities or non-utility organizations) were pleased with the Program overall, and they said they would participate again.

Program Materials

The Express Energy Efficiency Program, which does not require customers to complete an application, provides customers with measures free of charge. To participate, customers simply sign up via telephone or an online form that requests basic contact information and the customer's utility. During site visits, the field technicians use a paper form to capture date, address, basic facts about the home, and the number of measures installed during each visit. Different staff members manually enter the information into SPECTRUM after receiving the forms from the field technicians.

The Program Implementer put extensive quality assurance protocols in place to minimize data entry errors. The CY 2012 data entry process—which was costly, but adequate—was in place temporarily until the SPECTRUM database could be upgraded to allow for records to be uploaded in bulk.

The Evaluation Team also reviewed the operations manual, marketing materials and the field technician training presentation. Comments on these materials are located in Appendix L.

Barriers to Participation

The Express Efficiency Program offers services for a limited time in particular locations to customers of utilities participating in Focus on Energy who reside in single-family homes. The approach of offering services for a limited time in particular locations reportedly created barriers to participation. The utility representatives interviewed identified timing and geography as barriers related to the implementation strategy, and the Evaluation Team confirmed these barriers through nonparticipant surveys.

Implementation Timing

Under the current implementation strategy, customers need to become aware of the Program and to take appropriate action in a short window of time (usually from four to 12 weeks).

Four of 10 community partners interviewed mentioned that their customers had some trouble scheduling appointments due to lack of available appointment times, and the nonparticipants surveyed for this evaluation confirmed they had trouble scheduling appointments. Specifically, eight of 14 nonparticipant customers said they dropped out because of scheduling issues. However, in CY 2012,

[41] Anyone residing in a single-family home (1-3 units) and receiving electric or hot water from a utility participating in Focus on Energy was eligible for full service from the Program. Households receiving electric service but without electric hot water were eligible for CFLs only. Customers receiving natural gas service for hot water but not electric service from a participating utility were eligible for hot water measures only.

only 2% of customers who signed up for the Program dropped out, so this issue does not appear to be widespread.

Also, one utility representative reported receiving calls from customers who had been told they could not participate even though the Program was going on in their area because there were no available appointments. This representative had not been aware there was a limit to the number of appointments for participation.

Areas of Service

According to the implementation schedule, the Program will travel from county to county over the three-year cycle, targeting particular cities within a given county. Because the Program targets high-density areas, homeowners in low-density areas will likely not have access to the Program at any point in its three-year implementation.

Utility representatives did not seem to understand this geographic barrier and, thus, they may have miscommunicated about it to their customers. One cooperating utility representative reported learning that the active area was restricted to within city limits only after customers outside that boundary complained they were not allowed to schedule an appointment.

Marketing, Outreach and Training

The process evaluation for the Express Energy Efficiency Program addressed these key questions:

- What outreach methods does the Program use, and are they effective?
- Are staff and program partners aware of the Program design and communicating effectively with participants?
- Are any there any additional barriers to participation not addressed by the Program design?
- How can the Program be improved so as to increase the energy and demand savings?

Outreach

According to the Program Implementer, the primary method of outreach to customers in CY 2012 was a mailing from a cooperating local partner—usually the local utility but sometimes a non-profit organization. During the Program visits, customers received printed literature and customized recommendations from the field technicians about other Focus on Energy programs.

The Program Implementer reported that other outreach methods, such as ValPak advertising, resulted in negligible participation. The Evaluation Team did not have sufficient data to review participation rates by community or to compare participation across various outreach methods.

Utility Cooperation

When possible, the Program Implementer coordinated with the utility to send notice of the Program in a bill insert or letter. One utility reported it could not do a bill insert because the Program was not available to the whole customer base at the same time; however, that utility did inform customers in the Program area via letter.

In many cases, the Program Administrator uses contact information from Focus on Energy to reach out to the local utilities. After establishing a connection, the Program Administrator transfers communication to the Program Implementer. According to the Program Administrator, the Program Implementer also reaches out to some utilities independently. Like other programs, all outreach to utilities is conducted under the umbrella of Focus on Energy. Utility representatives identified their Express Energy Efficiency Program contacts as Focus on Energy representatives.

The Program Implementer said that utilities expressed frustration at multiple requests to provide outreach assistance to Focus on Energy Programs. According to the Program Implementer, utilities reported that they were approached by multiple Implementer staff members at different times, with no prior warning, and so they were unable to prioritize which programs they wanted to support and to what degree. Note that the scope of the evaluation for CY 2012 did not include interviews with the utilities that declined to participate, but these interviews have been added to the 2013 evaluation plan.

The Program Implementer reported that overall participation rates ranged from 4% to 15% of the eligible customers in targeted communities, and participation was markedly lower in communities where the utility did not participate. This finding is supported by the Evaluation Team's interviews with community partner representatives. Two of the non-profit organizations interviewed reported eligible customer participation rates in their areas to be 2% and 4%. In contrast, the representatives from communities that received utility marketing assistance reported participation rates as high as 14%.

Training

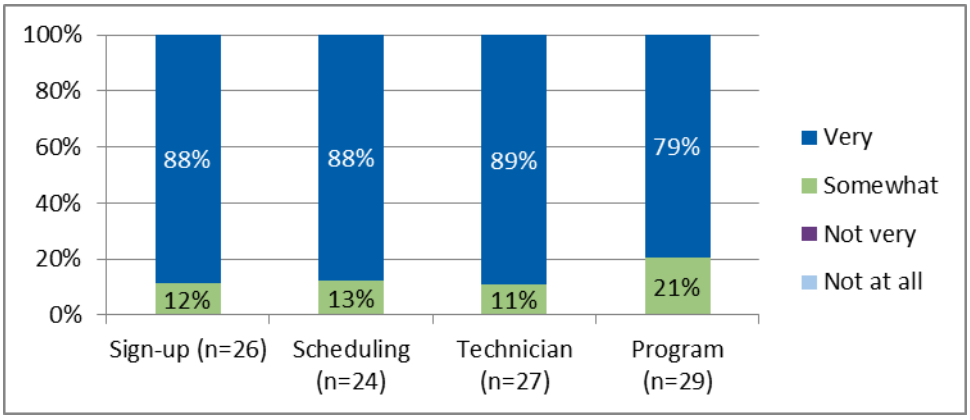
The Program Implementer trained all field technicians, both those directly employed and those subcontracted. This training consisted of:

- An installation process review,
- Information about the products being installed,
- Background information on the Express Energy Efficiency Program, and
- Information about other programs that might be of interest to customers.

Customer Response

The Evaluation Team surveyed 29 participating customers and 14 non-participating customers. In CY 2012, customer satisfaction with the Program's specific components and with the Program overall was high. Although some utility representatives noted a few instances of customer questions or complaints, customer response on the whole was very positive, as shown in Figure 28.

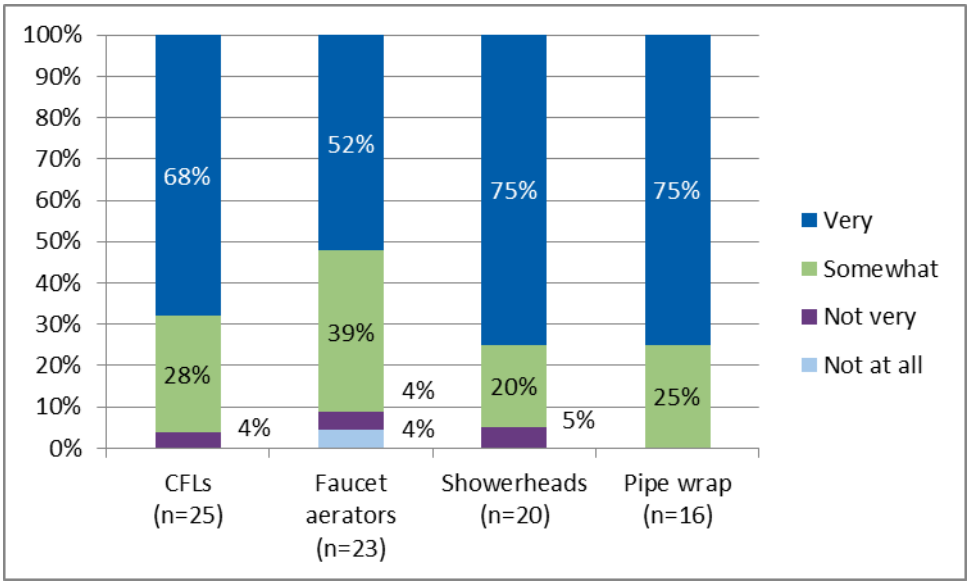
Figure 28. Customer Satisfaction With Aspects Of Program Delivery And Service



Source: Customer survey

Customer satisfaction with the overall Program was slightly lower than customer satisfaction with individual Program components, such as the sign-up and scheduling processes and the technician's skill and professionalism. This discrepancy may be because customers were less satisfied with faucet aerators and showerheads than with other measures. However, overall, customers were highly satisfied with the measures they received, as shown in Figure 29.

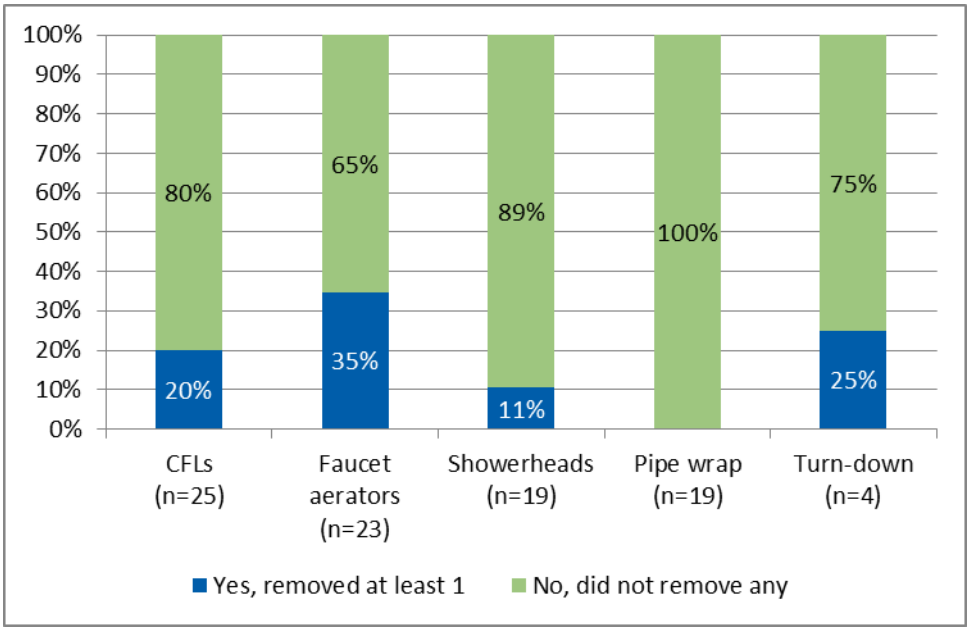
Figure 29. Customer Satisfaction By Type Of Measure



Source: Customer Survey

Nevertheless, some surveyed customers reported removing some of the Program measures, as reported in the Impact Evaluation section relating to Installation Rate. Figure 30 shows the percentage of interviewed customers who reported they removed at least one installed item, with the data shown by type of measure. Note that none of the surveyed customers removed pipe wrap.

Figure 30. Customers Confirming Removal Of At Least One Item



Source: Customer Survey

In summary,

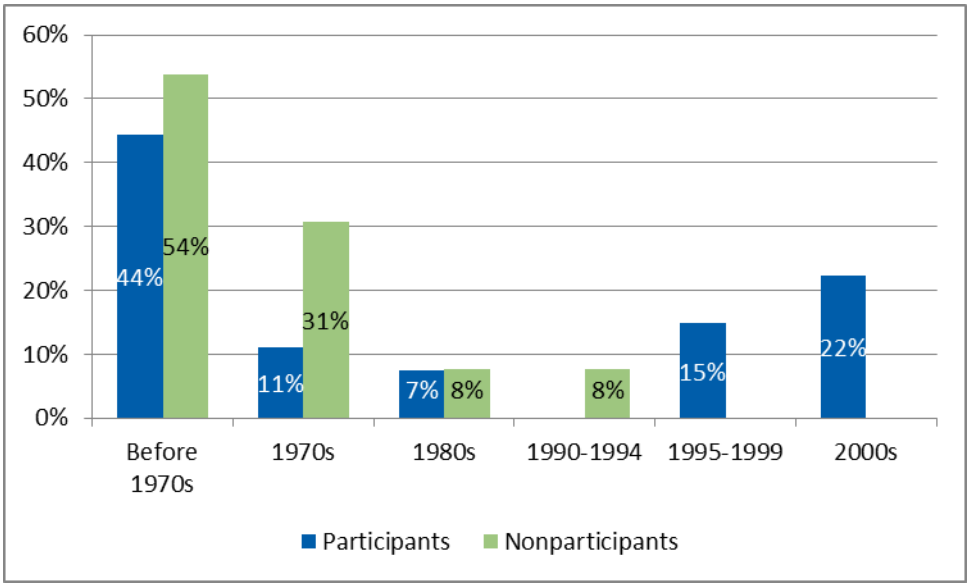
- 4 of the 5 customers who reported removing light bulbs said that the bulbs had burned out.
- 8 customers reported removing at least one faucet aerator:
  - 3 because they did not like the flow of water,
  - 2 because the aerator was broken or clogged,
  - 1 because the aerator was too noisy,
  - 1 because the aerator was the wrong style,
  - 1 did not give a reason,
- 2 customers said they removed showerheads because they did not like the reduced water flow.

One customer reset the water heater to a higher temperature after the installation visit but did not provide a reason.

Nonparticipants

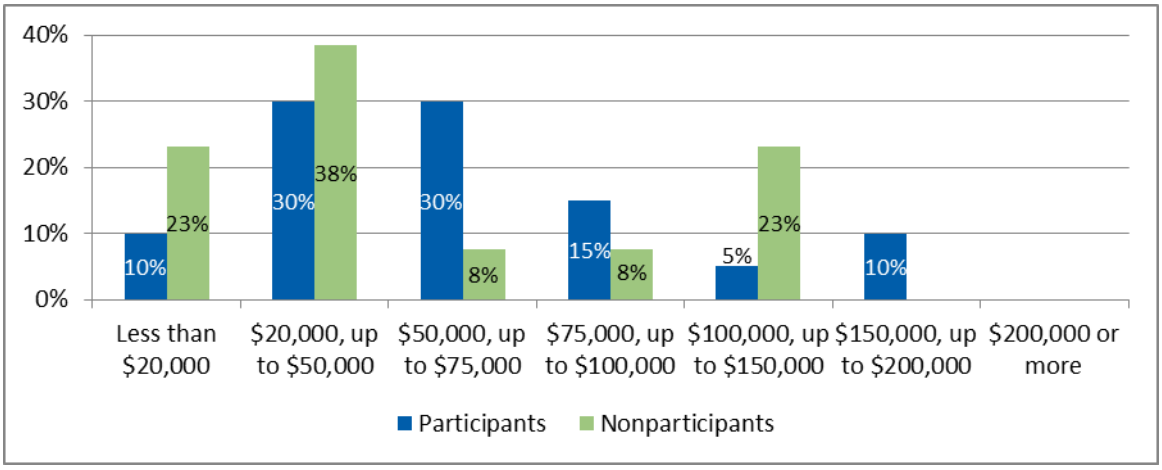
Survey data indicated that nonparticipants may differ from participants in several areas, although none of the observed differences were statistically significant. For example, participants reported having newer homes and slightly higher incomes than nonparticipants; however, in both groups reported income covered a wide range (see Figure 31 and Figure 32).

Figure 31. Year Home Was Built



Source: Participant Survey (n=27), Nonparticipant Survey (n=13)

Figure 32. Respondent Stated Income



Source: Participant Survey (n=20), Nonparticipant Survey (n=13)

Trade Ally Response

The Express Energy Efficiency Program is not implemented through a Trade Ally network. The Program Implementer reported delivering the Program through its own employees in 80% of communities, with subcontracted companies serving the remaining 20%. Subcontractors were used in communities that wanted to offer the Program beyond the originally-scheduled times. Note that the guidelines require that Program subcontractors must first be participating Trade Allies under the Home Performance with ENERGY STAR Program.

The Evaluation Team interviewed seven field technicians employed by the Program Implementer, but did not interview subcontracted installers. The field technicians described their understanding of

Program goals, their process when conducting a site visit, and the reactions they have seen from customers. These interviews were also designed to elicit opinions on staffing levels, effectiveness of Program design, and ideas for improvement.

The field technicians appeared to have a good understanding of their role in the Program. All of the field technicians interviewed discussed the Program goals in depth and described in detail their process for conducting a site visit. As one said, “We are kind of the face of the Program for the people who participate. We explain what we are installing, as well as Focus on Energy, and the Program."

With regard to distribution of materials,

- Fiver said they only provide materials to customers for those programs about which the customer is interested.
- One gave all materials to all customers.
- One did not specify.

After providing the print materials to the participants, all of the field technicians reviewed them with the customers, to prevent the information from being set aside and not read.

All of the interviewed field technicians reported that they install the materials in the homes they visit. However, five of 27 customers reported that the installer left some CFLs behind to be installed by the customer, and one of 19 customers responded that the technician did not install the pipe wrap.[42] This issue of having customers install measures is not addressed in the Program manual.

- Of the five homes where the bulbs were not installed directly, one customer did not indicate installing any of the bulbs, and one customer said that all six bulbs received were in storage.
- In the home where the pipe wrap was not installed by the technician, the customer reported installing the pipe wrap. The Evaluation Team did not ask field technicians directly if they ever left some materials behind without installing them.

The field technicians reported customers generally liked the Program, as confirmed by the customer surveys. However, they noted several exceptions:

- Some customers did not like the faucet aerators’ polished chrome finish when the aerators were used on faucets with a different finish (for example, bronze or brushed steel).
- Some customers rejected showerheads because they prefer a handheld showerhead or because the showerhead did not fit.

According to the field technicians, although many customers already had some CFLs and some fixtures required specialty products such as dimmable bulbs, they could usually find suitable sockets for additional bulbs. Occasionally, a customer rejected the bulb because of appearance.

[42] Number of customers surveyed varies because not all customers responded to all questions.

The field technicians said the Program measures were of good quality, and they reported no functional problems with CFLs, faucet aerators, or pipe insulation. Two field technicians noted that the showerheads occasionally leak, but said this was not a common occurrence.

Program Cost Effectiveness

The benefit cost (B/C) test, also known as a cost-effectiveness test, is used to compare the benefits of a demand side management program with the costs of the program. There are several tests used for evaluating energy efficiency cost-effectiveness. The benefit cost test used in Wisconsin is a modified version of the total resource cost (TRC) test. This test is a commonly administered test for evaluating energy efficiency programs. A description of the test can be found in Appendix H.

The CY 2012 Express Energy Efficiency Program was found by the Evaluation Team to be cost effective (a TRC ratio above 1). Table 100 below provides the Express Energy Efficiency Program costs and benefits:

Table 100. Express Energy Efficiency Program Costs And Benefits

	Express Energy Efficiency Program
Incentive Costs	$855,079
Administration Costs	$298,910
Delivery Costs	$681,648
Incremental Measure Costs	$524,403
Total Non-Incentive Costs	$1,504,961
Electric Benefits	$1,420,809
Gas Benefits	$5,079,986
Emissions Benefits	$1,528,258
Total TRC Benefits	$8,029,054
TRC Net Benefits	$6,524,093
TRC Ratio	5.34

Evaluation Outcomes and Recommendations

Outcome 1. Though Program delivery was smooth overall, the cumbersome data-entry process was a burden in CY2012. The Program Implementer reported that the unexpected need to key data into SPECTRUM and then review the records to check for errors required a great deal of labor. However, both the Program Implementer and Program Administrator reported that delivery was very smooth in most other respects, especially considering this was the first year of implementation in Wisconsin.

Recommendation 1. Solicit approval from the Public Service Commission to move forward with the modification of SPECTRUM so that it can accept bulk uploads of data, a solution agreed upon by both the Program Administrator and the Program Implementer. This update will ease the burden on Administrator and Implementer Staff members and allow them to concentrate on other aspects of program implementation.

Outcome 2. The city-by-city delivery strategy may limit customers' ability to participate in the Program at an optimal level. The delivery strategy presented a barrier to participation for some would-

be participants, because appointments in each location were limited, and some rural areas are not scheduled to be served by the program at any point. Although the absolute number of program drop-outs was small, there may be customers who—for the same reasons cited by the Program drop-outs—never reached the sign-up stage. While the findings from the Evaluation Team's nonparticipant survey are not conclusive, they suggest that the nonparticipant group could certainly benefit from Program services, since they may live in older housing stock and may have lower incomes than do participants.

Recommendation 2. Explore ways to add more flexible scheduling, or to provide greater advance notice about the Program, since either of these changes may reduce the drop-out numbers and allow the Program to reach more customers. Also, consider creating an alternative delivery plan for rural areas not scheduled for Express Energy Efficiency Program delivery, such as mailed kits, or "take-out" kits offered with a brief workshop.

Outcome 3. Although Program and measure satisfaction was high, some customer dissatisfaction with specific measures led to removal of measures and impacted program savings. Customer surveys and field technician interviews revealed some customer complaints about the measures being installed. Faucet aerators, in particular, had the lowest satisfaction rating, and customers surveyed reported removing some of them. Field technicians stated that customers had also requested some specialty CFL bulbs, different aerator finishes, and different types of showerheads. Overall, however, customer satisfaction with the measures and the program was high.

There are both advantages and disadvantages to addressing these customer requests and expanding the CFL selection, faucet aerator finishes, and showerhead options. The benefits include increased savings and increased customer satisfaction, especially if customers can choose which items to install in their homes. However, if the new items are more expensive, this could increase overall cost of the measures. Also, having customers choose from a variety of options could lengthen the installation visit. A third potential disadvantage is that having more options would make the program more complex in terms of ordering, stocking and tracking more measures, which might increase the administration costs, cause delays, and decrease customer satisfaction if some options are back-ordered.

Recommendation 3. Reassess the brand and style of aerator being installed in bathroom faucets, and explore alternatives. Based on customer comments that the aerators "splashed too much," the Evaluation Team recommends seeking aerators that have a gentler flow to avoid customer dissatisfaction leading to removal of measures. However, given the high level of customer satisfaction overall, the Team recommends maintaining the rest of the CY 2012 measure mix for CY 2013 and CY 2014.

Outcome 4. Field technicians leaving measures behind (rather than directly installing measures) impacted program savings. Although field technicians reported installing materials in their description of the home visit process, some customers reported that CFLs and pipe wrap were left behind for them to install. This resulted in a slightly reduced installation rate relative to if all materials distributed had been directly installed by the technicians.

Recommendation 4. Establishing a firm policy directing field technicians not to leave behind measures for customers to install and then document this policy in the operations manual. If established, this policy should be reviewed in field technician training, with training guides such as hypothetical scenarios in which customers request extra or spare materials be left behind, and possible technician responses.

Outcome 5. Utilities are critical partners in the Express Energy Efficiency Program, and effective communication with utilities is essential to program success. Utility partners were generally well satisfied with the Program. However, in some instances, utility staff noted they were unaware of important Program details, such as scheduling availability and geographic boundaries. More customers participated in those communities where the utility helped market the Program. The Program Implementer speculated that some utilities may have declined to participate out of frustration with multiple requests for outreach support from various Focus on Energy programs over the course of the year. The CY 2013 evaluation will interview nonparticipating utility partners to further explore this issue.

Recommendation 5. Keep utilities well informed of all details regarding Program implementation in their area. Proactively identify potential points of concern for utility staff, such as Program design elements that may impact utility customer satisfaction, and explain to staff what the Program is doing to address the concern. This will also help maintain a high level of utility satisfaction with the Program, which could be important for persuading additional utilities to take part in outreach activities. Details such as how and when the Program will deviate from the proposed schedule, how the Program will address scheduling congestion should it occur, and precise geographical boundaries for the active area in any given place or time, should be documented in the Program manual or other location, and this documentation shared with the utility staff. A single-page flyer directed to utility staff would be a simple and effective way to communicate this information. Furthermore, as discussed in the portfolio-level recommendations from the Evaluation Team, it may be helpful to coordinate all requests to utilities across the entire Focus on Energy portfolio, to allow them to better manage support needs.

Nonresidential Segment Program Findings

The nonresidential segment encompasses all nonresidential customers servicing the commercial, industrial, institutional, schools, government and agricultural sectors. The CY 2012 Evaluation reviewed four of the six programs included in the segment. The two programs launched in late 2012 and in 2013 and did not record energy savings in 2012. The CY 2012 Evaluation reviewed these programs:

- Business Incentive Program
- Chain Stores and Franchises Program
- Large Energy Users Program
- Small Business Program

This evaluation was designed to:

- Measure the 2012 nonresidential segment energy and demand savings;
- Review the programs' operational and delivery processes; and
- Identify opportunities to improve the programs' efficiency and effectiveness.

Due to the large number of measures and the significant amount of overlap in measures installed across the nonresidential programs, the Evaluation Team calculated realization rates by measure group (differing from the Residential evaluation which calculated realization rates by individual measure). The final measure group realization rates are values that the Evaluation Team has calculated with high confidence and precision. These values represent the weighted average of all measure-specific realization rates in that measure group, for which each individual value has a lower confidence and precision. As a result, it should be noted that:

- In some cases, the individual measure-level realization rates that feed into a single measure group vary widely. There may be some measures that have high realization rates and others that have low realization rates.
- Evaluation activities completed by the Evaluation Team to date represent roughly half of the total activities planned for the quadrennial cycle. As additional research is completed, more precise measure and measure group-level results will be available.
- Among the most common causes of variation in realization rates are differences in equipment counts, operating hours, savings calculation methodology, and baseline assumptions.

Business Incentive Program

The Business Incentive Program, launched April 1, 2012, offers prescriptive and custom incentives for installation of energy-efficiency measures to nonresidential customers who are not eligible for the Small Business Program[43], Chain Stores and Franchises Program, or Large Energy Users Program. The Business Incentive Program Implementer, Franklin Energy, manages and delivers the Business Incentive Program and relies more on Trade Allies to perform customer outreach and recruitment than prior Focus on Energy programs. Previously, Focus on Energy's nonresidential programs primarily relied on Energy Advisors to promote the programs to customers and drive participation.

The Evaluation Team conducted both an impact evaluation and a process evaluation of the Business Incentive Program. The ex post verified gross savings for CY 2012 are 105,022,010 kWh and 2,783,071 therms. Carryover projects from Legacy Programs contributed 25% of the kWh savings and 31% of the therms saved.

M&V Approach

These were the key questions that directed the Evaluation Team's design of the M&V approach:

- What are the gross and net electric and gas savings?
- How can the Program increase its energy and demand savings?
- What are the Program processes? 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 and Segment?
- How is the Program leveraging the current supply chain for Program measures and what changes can increase the supply chain's support of the Program?
- What is customer and Trade Ally satisfaction with the Program?

The Evaluation Team investigated gross and net energy savings, demand reduction impacts, operations, successes, and areas for improvement during the first eight months of the Business Incentive Program. Table 101 lists the data collection activities and sample sizes.

[43] 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.

Table 101. Business Incentive Program Data Collection Activities and Sample Sizes

Activity	Evaluation Area	Sample Size (n)	Relative Precision at 90% Confidence
On-Site Measurement and Verification	Impact	106	± 11%[1]
Project Audits and Verification Surveys[2]	Impact	116	± 11%[1]
Stakeholder Interviews[3]	Process	15	Qualitative
Materials Review	Process	N/A	N/A
Participant Customer Surveys[4]	Process and Impact	74	90/±10%
Partial Participant Customer Interviews[5]	Process	10	Qualitative
Participant Trade Ally Interviews[6]	Process	34	Qualitative
Nonparticipant Trade Ally Interviews[7]	Process	33	Qualitative

1 The Evaluation Team calculated the relative precision levels at the aggregate level, combining the project audit/impact participant survey sample with the on-site measurement and verification sample. The precision reported represents the relative precision of MMBtu for the Business Incentive, Chain Stores and Franchises, and Large Energy Users Programs combined.

2 The total number of completed project audits represents the total number of records sampled. To ensure proper weighting by realization rate savings, the Team merged multiple measures of the same category for a given application, thereby reducing the effective number of sample points.

3 Stakeholders include the Program Administrator, Program Implementer Management, Energy Advisors, and subcontractors.

4 Participants are customers who completed at least one project in CY 2012.

5 Partial participants are customers who submitted an application but did not receive an incentive.

6 Participant Trade Allies are: a) active and registered with Focus on Energy after April 1, 2012; or b) active but have not registered with Focus on Energy since April 1, 2012.

7 Nonparticipant Trade Allies registered with Focus on Energy prior to April 1, 2012, and did not re-register after April 1, 2012.

The Evaluation Team obtained data and information from a variety of stakeholders, market players, and Program participants, which provided multiple perspectives for assessing the Program operations and performance. The Evaluation Team conducted all interviews by telephone and analyzed the SPECTRUM Program data to develop sampling plans and support the evaluation analyses.

For the impact evaluation, the Evaluation Team conducted project audits, impact participant surveys, and on-site measurement and verification. The Evaluation Team selected a stratified random sample of projects for audits and participant surveys. 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 Trade Allies (if applicable);
- Energy audits and feasibility studies;
- Customer metered data;
- Invoices for equipment or contracting services;
- Any other documentation submitted to Focus on Energy.

After project audits, the Evaluation Team conducted participant surveys using e-mails and phone calls to follow up with the audited customers and collect information that was not available through SPECTRUM documentation.

The Evaluation Team selected an independent sample and conducted on-site measurement and verification, with a focus on high-priority measure groups and measure groups with highly uncertain savings. The Evaluation Team identified high-priority measure groups based on their contribution to the savings initially projected using the cost-effectiveness calculator and later verified by analyzing the CY 2012 program database.[44] The Team also determined the high-priority measure groups for the Business Incentive, Large Energy User, and Chain Store and Franchises Programs jointly; that is, the high-priority measure groups are the same for each program. The Evaluation Team made this determination recognizing that Focus on Energy standardized its eligible measures, measure specifications, and incentives across the three programs.[45]

In addition to facilitating the verification of energy impacts, on-site measurement and verification enabled the Team to gather data for evaluating critical program delivery issues, such as savings input assumptions and the discrepancies between verified savings and reported savings. Although tallied independently by the Team, all projects sampled for on-site measurement and verification also received project audits.

Table 102 lists a summary of activities the Team completed for the CY 2012 program by measure group.

Table 102. Business Incentive Program Impact Activities by Measure Group

Measure Group	Project Audit	On-Site Measurement And Verification	Total Analyses
Boilers and Burners	10	10	20
Compressed Air	7	8	15
HVAC	37	26	63
Lighting	36	36	72
Other[1]	18	17	35
Process	4	2	6
Refrigeration	3	7	10
GRAND TOTAL	**115**	**106**	**221**

[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, vending and plug loads, and wastewater treatment measures.

[44] This definition of "high-priority measure" was established through the 2012 PSEPs and is different from the definition set forth in the 2011 evaluation.

[45] This methodology resulted in high-priority measure groups that would not have been high priority for an individual program. Similarly, the high-priority measure groups for an individual program were not always identified as high priority with the three programs combined. The Evaluation Team will revisit high-priority measure groups for the CY 2013 and CY 2014 evaluations based on historical information.

The Evaluation Team identified high-priority measure groups based on their contribution to the savings initially projected using the cost-effectiveness calculator and later verified by analyzing the CY 2012 program database. The Team also determined the high-priority measure groups for the Business Incentive, Large Energy User, and Chain Store and Franchises Programs jointly; that is, the high-priority measure groups are the same for each program. The Evaluation Team made this determination recognizing that Focus on Energy standardized its eligible measures, measure specifications, and incentives across the three programs.[46]

Table 103 lists the high-priority measure groups for CY 2012 and their savings contribution to Business Incentive Program.

Table 103. Nonresidential High Priority Measure Groups And Business Incentive Program Gross Savings Contribution[1]

Measure Group	% of kWh Savings	% of KW Savings	% of Therms Savings
Boilers & Burners	2%	0%	34%
Building Shell	0%	0%	4%
Compressed Air, Vacuum Pumps	11%	13%	7%
HVAC	16%	14%	41%
Lighting	55%	69%	0%
Refrigeration	4%	3%	0%
Grand Total	**100%**	**100%**	**100%**

[1]Additional measures were not provided in this table. With additional measures the totals all equal 100%. As noted below Table 102. Business Incentive Program Impact Activities by Measure Group, all additional measures were combined into the "Other" category.

Impact Evaluation

The evaluation activities that informed the impact findings were a database review, project audits, on-site measurement and verification data, engineering analyses, and customer surveys to develop net-to-gross ratios. Table 104 shows the measure-level realization rates.

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. Some carryover projects approved in the prior Legacy Programs and completed after the new programs launched in April 2012 were included in

[46] This methodology resulted in high-priority measure groups that would not have been high priority for an individual program. Similarly, the high-priority measure groups for an individual program were not always identified as high priority with the three programs combined. The Evaluation Team will revisit high-priority measure groups for the CY 2013 and CY 2014 evaluations based on historical information.

the sample design.[47] The Team calculated realization rates at the measure level using savings-weighted averages across the three major nonresidential programs, resulting in identical measure-level realization.[48]

The Evaluation Team multiplied the measure-level Program gross savings by the corresponding measure-level realization rate to arrive at the total Program verified gross savings. Since these realization rates were calculated using only current Program projects, the Evaluation Team only applied the realization rates to the corresponding current Program projects.

[47] The SPECTRUM data extract identified carryover projects as assigned to the new programs. The Team later recognized that the projects were approved and initiated under previous Program designs, and learned they could be identified through use of a different data field. Carryover project findings were not applied to projects initiated in the new programs.

[48] Note that measure-level realization rates are not intended to reach 90/10 confidence and precision levels until the Evaluation Team completes three full years of evaluation and combines the results across the three major nonresidential programs (Business Incentive, Large Energy User, and Chain Store and Franchise).

Table 104. Nonresidential Business Incentive Program Realization Rates For Current Measures

Measure Group	Realization Rate		
	kWh	KW	Therms
Agriculture	94%	80%	100%
Boilers & Burners	144%	1597%	96%
Building Shell	94%	-	100%
Compressed Air, Vacuum Pumps	95%	119%	100%
Domestic Hot Water	94%	80%	100%
Food Service	94%	80%	100%
HVAC	93%	83%	100%
Industrial Ovens and Furnaces	-	-	100%
Information Technology	94%	80%	
Laundry	94%	-	100%
Lighting	107%	101%	-
Motors & Drives	94%	-	-
New Construction	94%	80%	100%
Other	94%	80%	-
Pools	94%	80%	-
Process	123%	108%	100%
Refrigeration	94%	97%	100%
Training & Special	-	-	-
Vending & Plug Loads	94%	-	-

[1]Realization rates for the Boilers and Burners are very high but have very little influence on the actual Program savings (less than 0.001%). While most Boilers and Burners measures only claimed therms savings, a very small percentage claimed KW and kWh savings as well. The evaluation sample contained one of these instances and skewed the realization rate calculation.

The Evaluation Team applied realization rates developed in previous evaluation findings for the Legacy Programs to carryover projects. Table 105 lists the measure-level realization rates for carryover projects.

Table 105. Nonresidential Business Incentive Program Realization Rates For Carryover Measures

Measure Group	Realization Rate		
	kWh	KW	Therms
Boilers and Burners	-	-	117%
Compressed Air	121%	96%	-
HVAC	48%	74%	163%
Lighting	87%	93%	
Other	79%	115%	93%
Process	103%	105%	-
Refrigeration	138%	110%	141%

Table 106 lists a separate weighted average realization rate for the Business Incentive Program's current measures and carryover measures.[49] While realization rates are identical across each of the three major programs, they are weighted differently for each individual program due to the differing relative contribution of savings by each measure group, resulting in differing program realization rates.

Table 106 lists the Program-level realization rate in KW, kWh, therms, and MMBtu.[50]

Table 106. Business Incentive Program Realization Rates

	Realization Rate			
	KW	kWh	Therms	MMBtu Total
Current	100%	103%	99%	101%
Carryover	104%	78%	128%	96%
Total	101%	95%	106%	100%

Gross and Verified Gross Savings

Table 107 lists the gross and verified gross savings.

Table 107. Business Incentive Program Gross Savings Summary

		Gross			Verified Gross		
		kWh	KW	Therms	kWh	KW	Therms
Current	Annual	75,871,878	10,734	1,955,080	78,474,381	10,738	1,929,451
	Lifecycle	928,719,860	10,734	27,077,469	960,295,351	10,738	26,696,668
Carryover	Annual	34,117,040	5,128	667,175	26,547,630	5,317	853,620
	Lifecycle	380,674,798	5,128	8,749,555	290,660,045	5,317	11,633,478
Total	**Annual**	**109,988,917**	**15,863**	**2,622,255**	**105,022,010**	**16,055**	**2,783,071**
	Lifecycle	**1,309,394,658**	**15,863**	**35,827,024**	**1,250,955,396**	**16,055**	**38,330,146**

Net-to-Gross Analysis

The Business Incentive Program Evaluation Plan states that the Evaluation Team planned to use the Standard Market Practice (SMP) method to calculate net savings. This evaluation design relied on the completion of the baseline study, which was not available for the CY 2012 Evaluation Report.

[49] This roll-up method influences the realization rate calculation. In this case, the Team applied standard measure-level realization rates to each program. If realization rates are were rolled up at the program-level instead of at the measure-level, the final weighted average realization rate will would have differed. This would also have reduced relative precision levels because the number of sample points per measure per program will would have decreased.

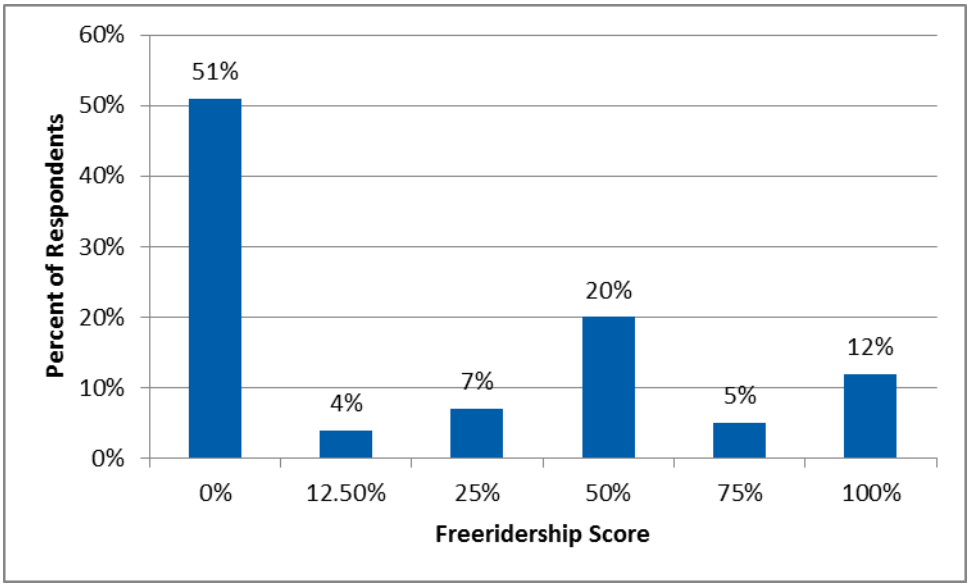
[50] MMBtu was calculated by converting kWh to MMBtu by multiplying kWh by 0.003412 and converting therms to MMBtu by multiplying therms by 0.1 and summing the result.

As an alternative to the SMP method, the Team asked a series of questions to determine freeridership and spillover in the participant survey.[51] Further information on the freerider scoring methodology and calculation of spillover appears in Appendix P.

Freeridership Findings

Freeriders are Program participants who would have purchased the same efficient measure at the same time without any influence from the Program. The Team derived the participants' freeridership score by translating their survey responses into a matrix value and then applying a consistent, rules-based calculation to obtain the final freeridership score. Figure 33 shows the Evaluation Team's estimates of the distribution of freeridership estimates assigned to individual participant responses.

Figure 33. Business Incentive Program Freeridership Distribution by Estimate



Overall, the Program had an average freeridership of 21% across all respondents; after weighting survey responses for each measure by the Program population, the Team evaluated gross energy savings distribution for the measure type and overall Program (Table 108). Similar measures are grouped by type where the sample size is sufficient.

Table 108. Business Incentive Program Freeridership Estimates

Program Measure Type	n	Freeridership Estimate	Absolute Precision	Population Savings Weights
Industrial	23	34%	± 12%	27%
Lighting	22	10%	± 8%	34%
Other	29	21%	± 11%	39%
Overall	**74**	**21%**	**± 7%**	**100%**

[51] See Appendix M G1–G14 and H1-H7 in the Business Incentive Program customer survey instrument.

The industrial measure group includes boilers and controls, boiler plant retrofits, process measures, compressed air measures, and split system air conditioners. The other category includes HVAC measures, boiler tune-ups, high efficiency furnaces, Variable Frequency Drives, and other equipment not included in the industrial and lighting groups. The Team did not find measures with consistently high freeridership.

Spillover Findings

Spillover results when customers invest in additional efficiency measures and do not receive rebates through the Program. Table 109 lists the savings values for five measures associated with four survey respondents who, using a scale of 1 to 5 indicated that their participation in the Business Incentive Program was "very influential" regarding their decision to purchase additional energy-efficient measures.

Table 109. Business Incentive Program Spillover Measures

Measure Name	Quantity	Per Unit MMBTU Savings	Total MMBTU Savings
LED Lighting	12	0.9	10.1
Gas Furnace	4	48.5	194.0
Variable Speed Drive	1	71.5	71.5
Variable Speed Drive	10	145.6	1,456.3
Boiler	1	128.9	128.9
Total			**1,860.9**

As shown in Table 110, the Team estimated the Program spillover as 7% of survey sample Program savings.

Table 110. Business Incentive Program Spillover Estimate[1]

Program Measure Type	Survey Sample Spillover MMBTU Savings	Survey Sample Program MMBTU Savings	Population Savings Weights	Spillover % Estimate
Industrial	204	15,677	27%	1%
Lighting	129	2,456	34%	5%
Other	1,528	12,465	39%	12%
Overall	**1,861**	**30,598 1**	**100%**	**7%** [2]

[1] 2012 Evaluated gross energy savings.

[2] Weighted by Program population evaluated gross energy savings distribution.

Net-to-Gross Findings

To estimate net-to-gross, the evaluation team combined the spillover and freeridership results using the following calculation:

$$NTG = 1 - Freeridership + Spillover$$

This yielded an overall net-to-gross estimate of 86% for the Business Incentive Program. Table 111 shows the net-to-gross estimates by measure group and by overall total for all measure groups. The CY

2012 net-to-gross estimates are noticeably higher than prior findings in Wisconsin, for example with a net-to-gross of 95% for lighting measures compared to 60% applied in CY 2011.[52] The estimates are on the high end of the range of net-to-gross findings observed in other nonresidential programs; however, direct comparisons can be difficult. In the past, Focus on Energy has identified freeridership as a specific area for improvement; however, the data available in CY 2012 was not sufficient to determine if actions taken may have contributed to this improvement.

Table 111. Business Incentive Program Freeridership, Spillover, And Net-To-Gross Estimates By Measure

Program Measure Type	Freeridership	Spillover	Net-To-Gross
Industrial	34%	1%	67%
Lighting	10%	5%	95%
Other	21%	12%	91%
Overall	21%	7%	86% [1]

[1] Weighted by Program population evaluated gross energy savings distribution.

Treatment of Carryover Program Data

The Team applied net-to-gross values developed in prior evaluation work to the gross savings for each of the measures in carryover projects that originated in Legacy Programs and were completed and paid incentives by the Business Incentive Program. Table 112 lists the net-to-gross estimates for each measure group.

Table 112. Business Incentive Program Carryover Net-To-Gross Rates

Measure Name	Net-to-Gross (MMBTU)
Boilers and Burners	100%
Compressed Air	60%
HVAC	45%
Lighting	60%
Other	100%
Process	59%
Refrigeration	48%

Net Savings

Table 113 provides verified net energy impacts (kWh, KW, and therms) for the Business Incentive Program in CY 2012. The savings provided below are attributable to the Program, net of what would have occurred without the Program.

[52] Stipulated net-to-gross ratios used in CY 2011 were based upon the results of the 2010 evaluation work.

Table 113. Business Incentive Program Net Savings

		Verified Nets		
		kWh	KW	Therms
Current	Annual	69,571,251	9,696	1,556,436
	Lifecycle	852,824,121	9,696	21,492,858
Carryover	Annual	22,110,542	4,551	595,837
	Lifecycle	234,421,929	4,551	7,767,565
Total	**Annual**	**91,681,792**	**14,247**	**2,063,138**
	Lifecycle	**1,087,246,050**	**14,247**	**29,260,423**

Process Evaluation

For CY 2012, the Evaluation Team's process evaluation focused on the effectiveness of the new Business Incentive Program and the identification of changes that would improve Program operations and success. The process evaluation addressed these key research questions:

- How effective are the Program marketing, outreach, and education activities in reaching targeted market segments?
- How well are the Implementer and Administrator establishing and leveraging the Trade Ally network to promote installation of high-efficiency equipment?
- What are the barriers to increasing customer participation in the Program, and how effectively are the Implementer and Administrator overcoming these barriers?
- Are customers and Trade Allies satisfied with the Program?
- How can the Program's delivery process be changed to cost-effectively increase the Program's energy and demand savings?

Program Design and Goals

Transition to New Program

According to stakeholder interviews, the transition from the previous nonresidential programs to the new Business Incentive Program was challenging for these reasons:

- Some roles and responsibilities were realigned due to lower staffing levels.
- The Implementer had to close out projects that were in progress under the old programs.
- Existing customers and Trade Allies were assigned to new Implementer staff members.
- Some Energy Advisors had to learn about new Segments, customers, and Trade Allies.
- Program stakeholders had to learn the new data tracking system, SPECTRUM, which initially had limited functionality and accessibility.
- The Implementer had to route customers to other programs because eligibility requirements were unclear to customers and Trade Allies.

The Program Implementer was able to route customers to the appropriate program after defined lists of eligible customers for the Large Energy Users and Chain Stores and Franchises Programs were

available.[53] However, in early 2013, the Implementer said it was still a challenge to route some small businesses into the correct program. They reported starting projects with customers, but later learned these customers were also eligible for the Small Business Program for all or a portion of the project. The Business Incentive Program Implementer thought it may be difficult for Trade Allies and customers to determine if the requirement of an average monthly demand of less than 100 KW was met.

Program Goals

The Business Incentive Program used only 78% of the revised CY 2012 budget. The Business Incentive Program was launched in April 2012. This shortened delivery period resulted in delays in launching several of the Business Incentive Program subprograms (such as Smart Lighting, Smart Buildings, and Exterior Lighting Optimization). It also caused changes in the cost-effectiveness calculations, which impacted the amount of savings for certain measures. Administrator and Implementer staff said goals were to establish a viable Trade Ally network, ensure customer satisfaction, and transform the market of customers eligible for the Business Incentive Program. The Evaluation Team identified the following qualitative goals in the 2012 Business Incentive Program Operations Manual:

- Cost-effective energy savings with high verified values and high attribution
- Geographical coverage
- Customer service
- Increased market participation

The Program Operations Manual also included several key performance indicators to demonstrate the progress of Program performance, such as reporting and contract timelines, quality and accuracy, incentive processing and invoices, call center metrics, complaint resolution, energy savings, and budget.[54]

Program Management and Delivery

The Implementer appointed a Program Manager to oversee the Program and development of Trade Ally engagement strategies. The Implementer assigned Energy Advisors into three groups by geographic regions in the state: southern Wisconsin, northeast Wisconsin, and northwest Wisconsin. Each region has one territory lead who works with the Trade Allies and projects in their region. The Business Incentive Program Implementer has other operations, engineering, marketing, and functional support staff and subcontractors who provide technical reviews, marketing and outreach, schools and government segment support, and general support services as needed.

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[53] The Business Incentive Program Operations Manual refers to the list of eligible customers in section 7.1 Customer Eligibility Requirements. The 2012 Operations Manual did not include Small Business Program customer eligibility because the manual was created prior to the launch of the Small Business Program; however, it is listed in the 2013 Business Incentive Program Operations Manual.

[54] Key performance indicators to demonstrate Program performance, while not final in the 2012 Business Incentive Program Operations Manual, were final in the 2013 Operations Manual.

Program Materials

The Evaluation Team reviewed the Program Operations Manual and other documentation the Administrator and Implementer used to support training, outreach, and operations and found these documents met or exceeded industry best practices in terms of thoroughness, completeness, and ease of use. Appendix L details the findings of the materials review process. The Program materials effectively detailed these major components of the Business Incentive Program:

- Policies, procedures, training, and resources for staff
- Marketing plan, outreach, and education materials
- Data collection and QA/QC protocols
- Administrator and Implementer Staff roles and responsibilities
- Program requirements
- Process flowcharts and organizational charts

According to Trade Allies the Evaluation Team surveyed, completing the Program application forms can be cumbersome and time consuming. There are almost 30 different application forms available for Business Incentive Program projects. Customers and Trade Allies can only enter data electronically into a few of them. Even on those few electronic forms, Trade Allies and customers are unable to save information or transfer data to additional forms. Focus on Energy is planning to launch an updated Website in CY 2013 and has slated Web-based applications as one of the new features.

Application Processing

The Implementer expressed concern about the time required for project approval, reporting that it is often longer than most participants expect. Application processing is a collaborative team effort that involves the Administrator, and the Implementer. Toward the end of the 2012 Program year, these stakeholders worked together to improve the application process so that the anticipated increase in year-end applications could be processed more efficiently. The improvements included:

- Using SPECTRUM's queue functionality to streamline the application and review process to expedite approvals. This enabled multiple reviews and individuals at each level to share review responsibility at key stages.
- Setting up conference calls to review the status of application reviews, which helped everyone, communicate better and added more individual accountability.
- Taking advantage of the flexible staffing capability the incentive processing subcontractor offers; which increased staff from one full time employee to four full time employees during the month of December.

These process improvements allowed Administrator and Implementer Staff to process 779 project applications in December. Savings from these December projects account for nearly 30% of the reported gross savings (kWh) in CY 2012.

There is no set time goal or requirement for application processing in the Business Incentive Program Implementer's contract with the Administrator. The Administrator said they have an unofficial goal of

sending a check to the customer within eight to 10 weeks of the time a customer sends in a completed prescriptive application (accompanied by all necessary supporting documentation). This is consistent with survey findings—over 80% of customer survey respondents said they received their incentive check within 10 weeks. However, almost 20% of participant customer survey respondents said it took longer than 10 weeks to receive their checks. According to customers, rebates for custom projects took about the same amount of time to process as rebates for prescriptive projects. The Business Incentive Program Implementer agreed that timing guidelines for processing applications from receipt to approval are not documented. In addition, complications with SPECTRUM may have significantly increased processing time for projects transferred from the previous program with limited information. The Business Incentive Program Implementer said they expect the Program Administrator to include goals for processing times in their long-term contract, which is under negotiation in 2013.

Program Outreach and Marketing

Customer Awareness

The Administrator and Implementer said they are concerned that many customers do not know, or may be confused about, the programs and incentives available to their businesses through Focus on Energy. They thought this confusion was due to the change in Administrator and Focus on Energy temporarily discontinuing renewable energy incentives in CY 2011 due to limited budget resources. They also thought that small and rural businesses are less likely to be aware of Focus on Energy because there is less outreach in these areas and because these businesses have less capacity to investigate project opportunities. These same stakeholders suggested portfolio-wide marketing campaigns, events, and sponsorships to increase general customer awareness of Focus on Energy and its programs.

Outreach to Trade Allies

According to the Business Incentive Program Marketing Plan, the Administrator and Implementer do gear the majority of their outreach activities toward driving Trade Ally participation in the Business Incentive Program. The Implementer focuses on recruiting and registering new Trade Allies with Focus on Energy. Trade Ally outreach activities include initial Trade Ally rollout meetings (Trade Ally Expos), e-mails, phone calls, in-person visits, Webinars, and training sessions.

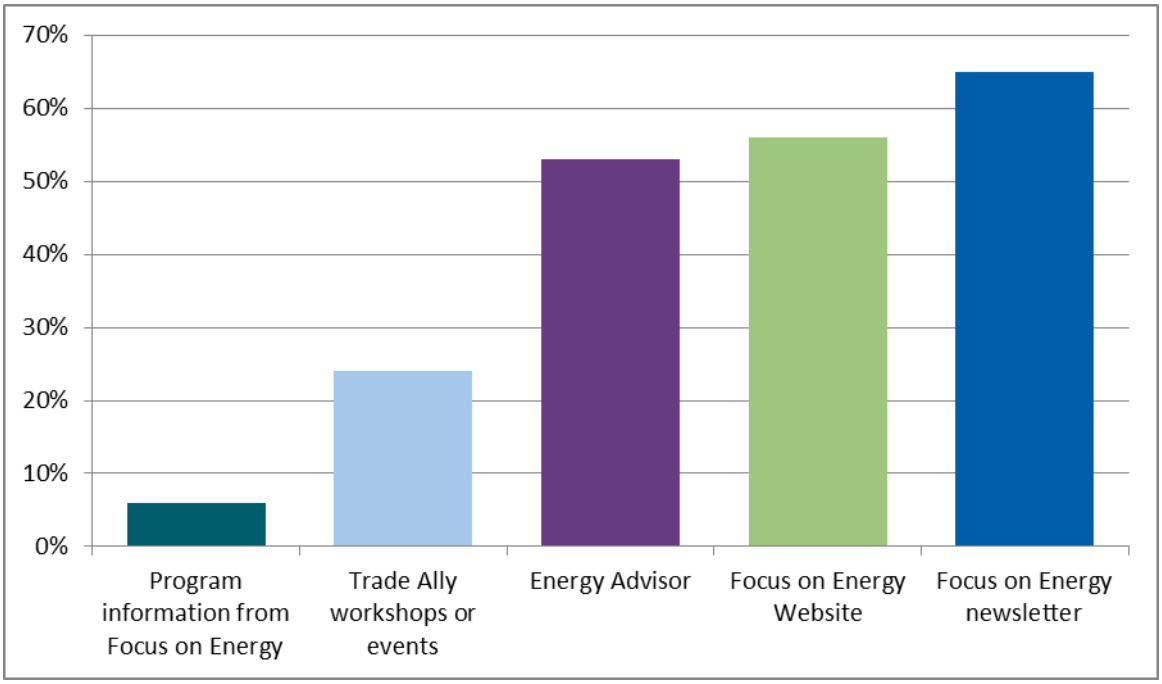
Both the Administrator and Implementer said there were some lessons learned about communicating with Trade Allies during the first year of the Business Incentive Program. The Implementer said there were issues with staff members from multiple Focus on Energy programs contacting the same Trade Allies several times. The Administrator said they would like to see more centralized Trade Ally outreach to avoid having multiple programs contacting the same Trade Ally too many times, but know this might require a larger budget. The Administrator is working on a portfolio-level Trade Ally management plan for CY 2013.

Participant Trade Allies said they stay informed primarily through:

- The Focus on Energy newsletter (65%)
- The Focus on Energy Website (56%)
- Direct contact with an Energy Advisor (53%)[55]

Many of the same Trade Allies that said they get their information from the newsletter or Website also said they kept informed by contacting an Energy Advisor. One Trade Ally said that his customers told him about updates to the Program before Focus on Energy and two others mentioned hearing about the changes in the field before a Focus on Energy representative contacted them.

Figure 34. How Trade Allies Stayed Informed About The Business Incentive Program



In the future, participant Trade Allies said they would like to receive information primarily through these same methods, or even better, to receive personalized e-mails with information relevant to their business directly from a Focus on Energy representative.

Outreach to Customers

In CY 2012, the Implementer attempted to increase customer awareness by updating descriptions and downloadable brochures on the Program Website as well as running print ads in statewide and geographically targeted business journals and agribusiness publications. The Administrator and

[55] Percentages shown are based on the number of respondents. Because this interview question allowed for multiple responses, percentages exceed 100% total.

Implementer also participated in trade shows and had booths featuring relevant materials, business cards, branded apparel, and branded give-away items like a fold-up camp chair.

Over one-half (56%) of participant customer survey respondents and one-half of partial participant customers (five of 10 respondents) said they first learned about the Program through a contractor or vendor. This finding is consistent with the emphasis on marketing through Trade Allies. Participants reported that they learned about the Business Incentive Program through:

- A trade or professional association (20%)
- Focus on Energy (14%)
- Their utility company (12%)

Outreach Initiatives

To encourage Trade Ally participation and to highlight specific eligible equipment, the Program offers these bonuses to both Trade Allies and customers during CY 2012:

- Trade Ally Bonus – Promoted error-free project applications from Trade Allies.
- New Trade Ally/Welcome Back Bonus – Encouraged new or previous Trade Allies to register with Focus on Energy.
- New Customer/Welcome Back Bonus – Encouraged new or previous customers to participate in the Business Incentive Program.
- Early Completion Bonus Incentive – Encouraged customers to submit completed project applications early.
- Food Service Multiple Equipment Bonus – Encouraged adoption of multiple types of energy-efficient food service equipment.

Overall, stakeholders said that bonuses were more effective for customers than for Trade Allies, with the early completion bonus being especially effective at driving application submissions prior to the deadline. Some stakeholders thought the Trade Ally bonuses worked for smaller Trade Allies, but others thought small firms seemed too busy to do all of the paperwork. In addition, stakeholders thought the Trade Ally bonuses were not substantial enough to attract larger Trade Allies.

Participation Process and Experience

Customer Satisfaction

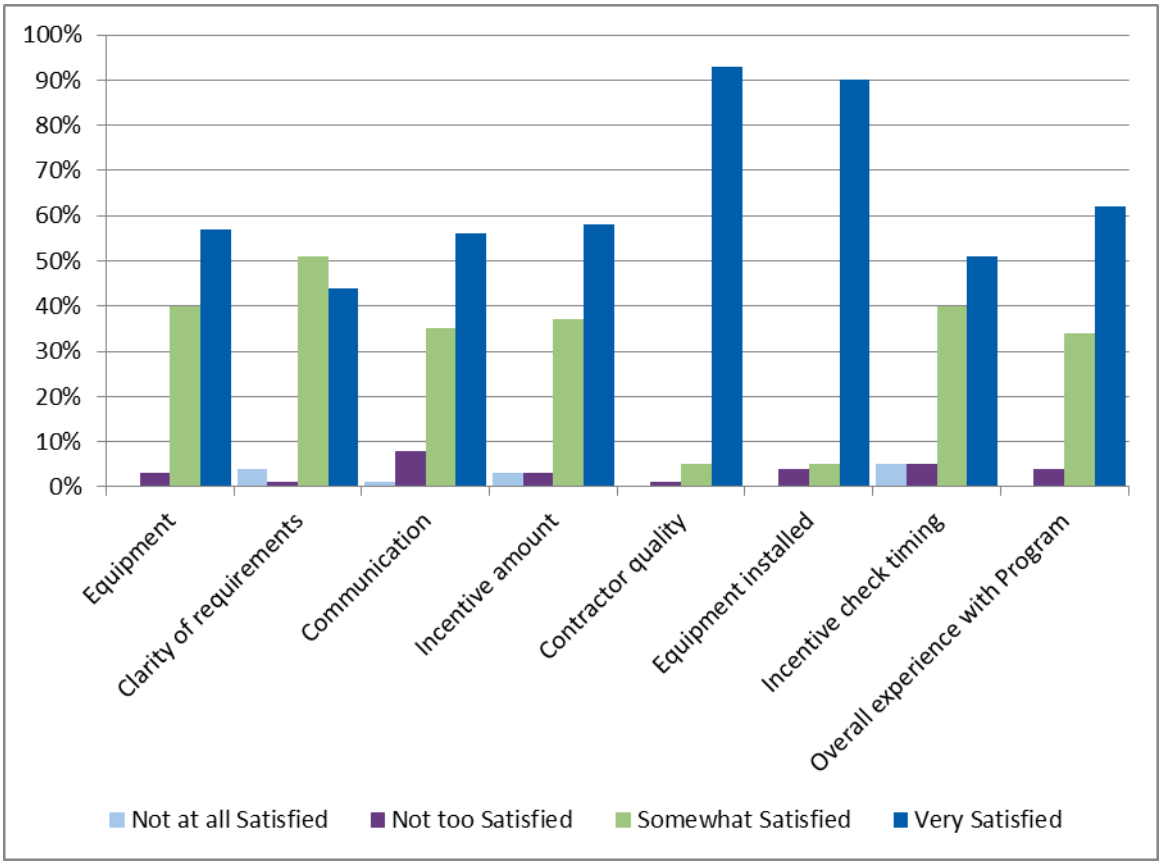
As shown in Figure 35, when asked about Program satisfaction, participating customers gave especially high ratings for:

- Contractor quality (93% very satisfied), and
- Equipment installed (90% very satisfied).

Fifty to 62% of customers gave very satisfied ratings to their overall experience, the incentive amount, and the equipment. The lowest proportion of very satisfied ratings was for the clarity of Program requirements and timing of the incentive check. While few customers gave the Program negative

ratings, the substantial proportion of somewhat satisfied ratings suggests that the Administrator and Implementer can make improvements in these areas.

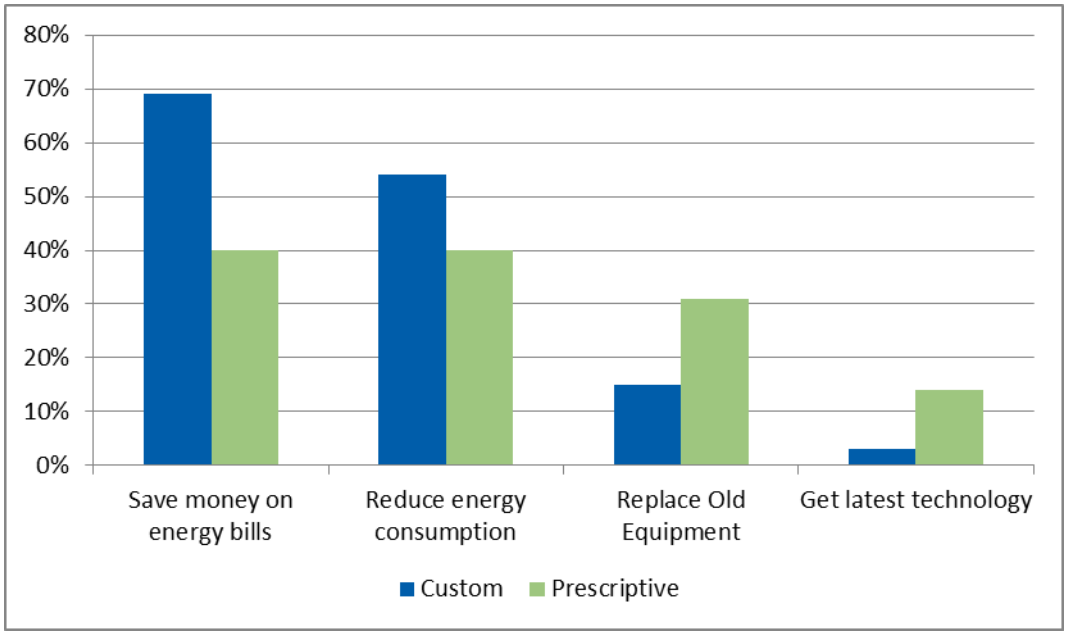
Figure 35. Customer Satisfaction With The Business Incentive Program (n=74)



Customer Decision-Making

Customers most frequently reported saving on energy bills was their main motivation for participating in the Business Incentive Program (Figure 36). Customers also reported they wanted to reduce energy consumption, replace old equipment, and get the latest equipment technology. Customers with custom projects more frequently participated in the Business Incentive Program to save money on energy bills and to reduce their energy consumption, while customers with prescriptive projects more frequently participated in the Business Incentive Program to replace old equipment and get the latest technology.

Figure 36. Primary Reasons For Participating In The Program By Project Type (n=74)[1]



1 Percentages shown are based on the number of respondents. Because this interview question allowed for multiple responses, percentages exceed 100% total.

Participants reported several benefits from participating in the Business Incentive Program, with some notable differences between custom and prescriptive projects. Overall, the most frequently mentioned benefits of participation were:

- Lower energy bills (55%),
- The energy savings (49%),
- Increased occupant comfort (15%),
- Lower maintenance costs (12%), and
- Environmental benefits (11%).

Custom project customers said that increased customer comfort was a benefit of participation more frequently than prescriptive customers (21% versus 9%, respectively). On the other hand, prescriptive customers mentioned lower maintenance costs as a benefit of participation more frequently than custom customers (20% versus 5%, respectively).

While the Trade Allies interviewed agreed that money motivated customers to participate, most (76%) said the Program incentives drove participation, 29% said that the reduced energy costs influenced the customer's decision. Trade Allies also said quicker payback on the equipment purchased and lower operations and maintenance costs provided further motivation to customers.

Barriers to Participation

Participant and partial participants reported that the biggest barrier to making energy-efficient improvements is the high cost of the new equipment. Participants also cited budget limitations, a long payback period on the equipment, and lack of technical knowledge as barriers.

Eighty-eight percent of the Trade Allies interviewed agreed that limited funds or lack of capital was the main obstacle to customer participation. While some Implementer staff the Evaluation Team interviewed saw paperwork as a barrier to participation, Trade Allies said they usually take care of most paperwork and use that as a selling point for customers.

Nonparticipant Trade Allies thought the most significant obstacles to customers making high-efficiency improvements were: limited capital (63%) and the customers' lack of technical knowledge (19%). To overcome these barriers, they mentioned that Focus on Energy could offer: more education and marketing (26%) or offer more incentives (19%).[56]

Trade Ally Network

The Business Incentive Program Trade Ally network includes specialists in HVAC, insulation, and electrical contracting, builders, retailers, distributors, and manufacturers. However, the majority (71%) of participating Trade Allies said they only offered one type of equipment, most often lighting, and 50% of all Trade Allies interviewed only worked with lighting.

Trade Ally Registration

To become a Trade Ally and receive regular communication, program updates, and support from Focus on Energy, businesses must fill out a three-page application form, sign the registration terms and conditions, and submit the completed form to Focus on Energy. A large majority of participating Trade Allies interviewed said they were very satisfied (62%) or somewhat satisfied (20%) with the registration process. The Trade Allies who were not satisfied with the enrollment process said they were mainly dissatisfied that they had to take the time to reapply.

Once registered, the Administrator and Implementer assign the Trade Ally an Energy Advisor, add the contractor as a registered Trade Ally on the Find it With Focus Website, and add the firm to the distribution list for the regular Program communication.

Rebuilding the Trade Ally Network

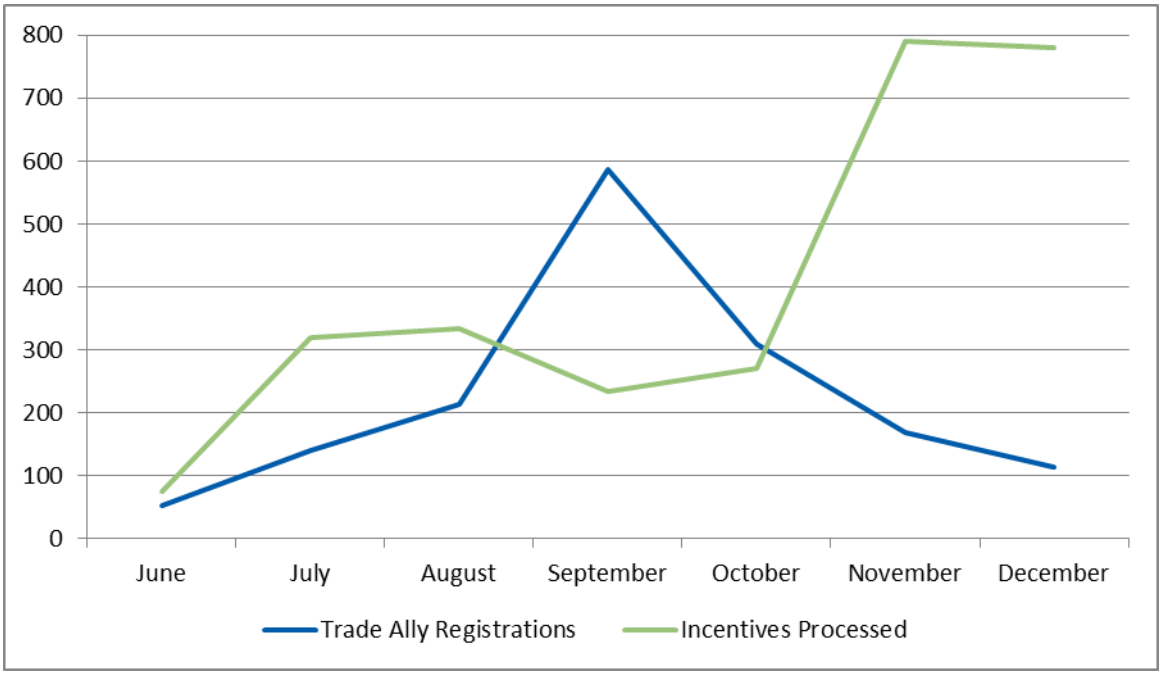
Program stakeholders explained that when the Business Incentive Program began, the existing registered Trade Ally network was out of date and many of the Trade Allies were not actively driving Program participation. To address this challenge, the Implementer organized an outreach blitz using phone calls, e-mails, or in-person visits from Energy Advisors. This blitz took place from August to October 2012 to increase Trade Ally enrollment and engagement. The Administrator and the Implementer both said the blitz was a great success.

[56] Percentages shown are based on the number of respondents. Because this interview question allowed for multiple responses, percentages exceed 100% total.

The Evaluation Team's review of the Trade Ally database shows a significant increase in registrations during the blitz. Over 1,000 Trade Allies submitted registration applications during that time period, with over half of those submitted in September 2012.[57] Figure 37 shows Trade Ally registrations and incentives processed by month before, during, and after the blitz.

The Evaluation Team cannot determine if the increase in Trade Ally registrations is the only factor that produced an increase in incentives processed because other factors, such as the end of year bonuses and the year-end application deadline, may have had an effect on the number of applications processed. Regardless, a significant increase in the number of applications processed occurred after the blitz.

Figure 37. Number Of Trade Ally Registrations And Incentive Applications By Month



Information Desired by Trade Allies

When asked about their information needs, participating Trade Allies repeatedly mentioned that they wanted more frequent Program updates and more personalized and direct information from Focus on Energy. As shown in Table 114, slightly over one-third of participating Trade Allies wanted more information related to the equipment included in the Program and the benefits of being a registered Trade Ally. Additionally, about one-quarter of the time Trade Allies said they wanted more information about the customer qualification requirements and how to apply for custom and prescriptive incentives.

[57] Trade Ally applications where the Trade Ally indicated they worked with business customers. Applications received during this time were for all Focus on Energy programs, not just the Business Incentive Program.

Table 114. Information Needed By Participant Trade Allies (n=34)

Information Desired by Participant Trade Allies	Percent of Respondents Requesting This Information
The equipment included in the Program	32%
Benefits for registered Trade Allies	32%
Customer qualification requirements	24%
How to apply for custom incentives	24%
How to apply for prescriptive incentives	18%

Most nonparticipant Trade Allies said they were very interested in participating in Focus on Energy, and many of these Trade Allies wanted more information about Program offerings.

Trade Ally Satisfaction

Participating Trade Allies said participating in the Program provided these benefits:

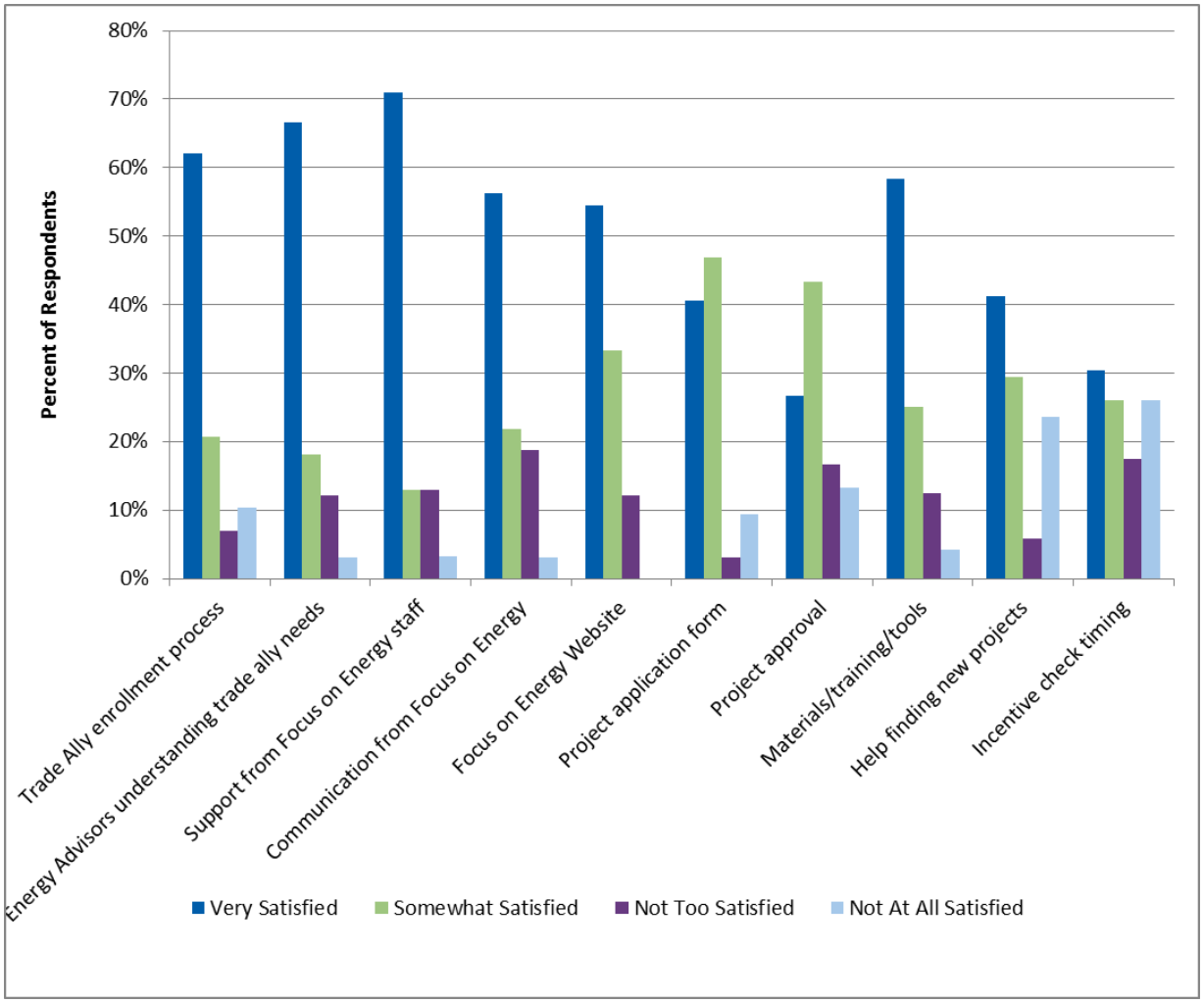
- Increasing sales (73%),
- Moving projects forward that would not have otherwise (24%),
- Developing good customer relations (21%),
- Helping customers save money on their energy bills (15%),
- Associating their business with Focus on Energy to get third-party credibility (15%),
- Attracting customers they otherwise would not have gotten (15%).

When surveyed about their satisfaction with the Program, participating Trade Allies gave especially high ratings for:

- Support from Focus on Energy staff (71% very satisfied),
- Energy Advisors understanding of Trade Ally needs (67% very satisfied), and
- The Trade Allie enrollment process (62% very satisfied).

Trade Allies reported being the least satisfied with incentive check timing, help finding new projects, and project approvals. Figure 38 lists Trade Ally satisfaction responses in these and other aspects of the Program.

Figure 38. Trade Ally Satisfaction With The Business Incentive Program (n=33)



For Trade Allies without an existing relationship with an Energy Advisor, satisfaction with the Focus on Energy call center is low. These Trade Allies said the call-center bounced them around to different contacts, that the person they spoke to was unable to answer their questions, or that they are not sure who they need to speak to at Focus on Energy about their questions. Trade Allies consistently suggested appointing a single Program contact they could speak to when they had questions.

Trade Allies reported that it took too long to receive the incentive check, especially when compared to other programs some of them had worked with. Most of the Trade Allies that were not satisfied with the project approval process had specific issues with the custom project approval process. Feedback included statements that the preapproval process took too long and it delayed them from closing the sale with the customer. They also reported long delays in receiving project status updates from Administrator and Implementer Staff.

Trade Ally Training

The Implementer said the Program offered the following training opportunities and tools to Trade Allies in CY 2012:

- Express Lighting Tool and training series,
- Rooftop Optimization offer and training series,
- Five Trade Ally expos across the state,
- In-person trainings,
- Webinars.

Sixty-five percent of Trade Allies interviewed had received some training or tools from Focus on Energy. They most frequently mentioned:

- Trade Ally Expos (44%),
- Express Lighting Tool (12%),
- Roof Top Optimization Tool (6%).

Eighty-three percent of Trade Allies said they were very or somewhat satisfied with the training, tools, and materials, 13% were not too satisfied, and one respondent was not at all satisfied. One Trade Ally who was less satisfied said he wished the lighting training had been more in-depth and another said the training was not a good use of his time because he had driven a long way to attend the training and the information was the same as in an e-mail he received beforehand.

When asked if they would like more training or tools from the Program, almost one-half of the Trade Allies said they would like the following:

- 27% mentioned Program updates, such as the incentives offered, changes to Program, and equipment covered; this is consistent with previous information requests from Trade Allies.
- 21% said they would like a general calculation tool to help calculate expected energy savings and payback period at a high level when meeting with customers.

While the Administrator thought the Trade Ally trainings and materials were effective for CY 2012, they thought the Business Incentive Program Implementer should provide more actionable and simplified information to the Trade Allies.

Energy Advisors in more rural areas expressed a desire for more training, since not all their Trade Allies could attend the in-person sessions previously offered. An increased number of Webinars were mentioned by one staff person as a possible solution to reaching more Trade Allies in rural areas.

Data Management

The Administrator and Implementer Staff interviewed said their experiences with SPECTRUM improved over the course of the Program year. At its launch, they said they needed extensive time to learn how to use SPECTRUM since it was not as user-friendly as the previous database. For a while, staff from

different programs produced reports with conflicting information from SPECTRUM. Focus on Energy solved this problem by creating a standardized Progress Summary Report for all parties to use.

SPECTRUM has not yet integrated customer relationship management (CRM) functionality, which the Business Incentive Program Implementer said was a critical for tracking communications and activities for both customers and Trade Allies. Because SPECTRUM lacks CRM functionality, the Administrator uses a spreadsheet, and the Implementer has developed a Microsoft Access database to track Trade Ally information such as applications or contacts and communication with Trade allies. The Implementer also said they would like to be able to link Energy Advisors with the Trade Allies they work with so they can track how well Energy Advisors are reaching out to and managing Trade Allies.

Program Quality Assurance and Verification

The Business Incentive Program Operations Manual describes detailed quality assurance (QA) and project verification procedures. Depending on the incentive amount, the Implementer's subcontractor (Lockheed Martin), and/or the Administrator can perform both preapproval and payment reviews before a project receives the final approval to mail the incentive check. All projects receiving final incentives of $25,000 or above, and at least 5% of the remaining projects, require a post-installation site verification by the Program Implementer before the project is allowed to pass to final review.

Each project file has a checklist that provides a systematic methodology for reviewing the project materials, and this serves as a quality control document that the Administrator and Implementer can use to easily evaluate the contents of the file. The checklist outlines the processes for reviewing complete prescriptive and custom projects, partially or fully disqualified projects, and projects requiring preapproval.

The quality control plan does not clarify whether one staff member or multiple staff members from each stakeholder location perform the review, so it is possible that six or more staff could review a project before receiving final approval. There are no written guidelines or objectives in place for how long a project should be with each reviewer, although there are informal internal guidelines that address this.

Program Cost Effectiveness

The benefit cost (B/C) test, also known as a cost-effectiveness test, is used to compare the benefits of a demand side management program with the costs of the program. There are several tests used for evaluating energy efficiency cost-effectiveness. The benefit cost test used in Wisconsin is a modified version of the total resource cost (TRC) test. This test is a commonly administered test for evaluating energy efficiency programs. A description of the test can be found in Appendix H.

The CY 2012 Business Incentive Program was found by the Evaluation Team to be cost effective (a TRC ratio is above 1). The Business Incentive Program Carryover was found by the Evaluation Team to be cost effective. Table 115 below provides the Business Incentive Program costs and benefits:

Table 115. Business Incentive Programs Costs And Benefits

	Business Incentive Program
Incentive Costs	$7,300,404
Administration Costs	$1,188,424
Delivery Costs	$4,852,830.77
Incremental Measure Costs	$33,808,457
Total Non-Incentive Costs	$39,849,711
Electric Benefits	$62,891,729
Gas Benefits	$23,806,769
Emissions Benefits	$27,483,016.85
Total TRC Benefits	$114,181,515
TRC Net Benefits	$74,331,803
TRC Ratio	2.87

Evaluation Outcomes and Recommendations

Impact Evaluation

The impact findings for the Business Incentive Program and other nonresidential programs are summarized below in the Nonresidential Segment Measure-Related Recommendations section (Page 263).

Process Evaluation

Despite start-up challenges early on and a limited (nine month) implementation period, the Business Incentive Program performed well and maintained strong customer and Trade Ally satisfaction in many areas. Additionally, the Implementer worked to build a strong foundation for the new Program through outreach and training activities that re-engaged the previously stagnant Trade Ally network.

Outcome 1. There is not an efficient way for the Administrator and Program Implementer Staff to determine average monthly customer electricity demand in order to qualify customers for the Small Business Program. In early 2013, the Business Incentive Program Implementer said it was still a challenge to route some small businesses into the correct program because the qualifying factor for the Small Business Program is average monthly electric demand of less than 100 KW, which the Implementer thought may be an obscure concept to Trade Allies and customers. The Business Incentive Program Implementer said they had started projects with customers originally referred to Business Incentive Program that they later identified as Small Business Program participants for all or a portion of the project.

Recommendation 1. Focus on Energy should consider alternative ways to qualify customers for the Small Business Program. The Business Incentive Program Implementer could ask customers a few screening questions on the application. This will help to identify customers who may qualify for Small Business Program before the Implementer begins working with them. Since Trade Allies and the Administrator and Implementer that do not have direct access to average monthly demand, they could ask customers about their facility square footage and calculate energy intensity (energy use per square foot). The Implementer identified this as a way they could screen for and qualify eligible customers.

Outcome 2. The length of time to preapprove custom projects and process incentives is too long, resulting in lower satisfaction among customers and Trade Allies. Almost 20% of participant customer survey respondents said it took longer than 10 weeks to receive their incentive check, and customers were slightly less satisfied with this component of the Program compared to other satisfaction scores. Trade Allies who were dissatisfied with the custom preapproval process thought it was lengthy and also felt communication about preapproval status was lacking.

Recommendation 2. Focus on Energy should establish and communicate goals for project processing timelines for both custom and prescriptive projects and track how well they meet those goals. Making the project processing more transparent may help manage customer and Trade Ally expectations regarding approval and incentive timing.

Outcome 3. For CY 2012, the Program application forms were not user-friendly. There are almost 30 different application forms available on the Website for Business Incentive Program projects. Those applying can only fill out a few of the applications electronically and can only submit an application by mail, e-mailing a scanned print copy, or fax. There are no instructions or guidance on the Website or in the materials the Team reviewed instructing Trade Allies and customers how to fill out the forms. Trade Allies said they try to complete the paperwork for their customers as an added service, and the paperwork takes a long time to fill out. Focus on Energy is planning to roll out new electronic forms in CY 2013.

Recommendation 3. Since Focus on Energy is rolling out the new forms and Website in stages, the Administrator and Implementer should proactively provide early training and information about how to use the new electronic forms in CY 2013 and monitor the market response. Some Trade Allies may be reluctant to use the new electronic forms and will benefit from training, FAQ sheets, and examples of how to fill out the forms. Prior to rollout, Focus on Energy should consider testing the online forms with Trade Allies to identify areas where instructions or clarifications are needed.

Outcome 4. Trade Allies want more frequent and tailored updates about the Program and more direct access to help. Trade Allies repeatedly said they wanted the Administrator and Implementer to better inform them about Program changes and new incentives. Only 56% said they were “very satisfied” with communications from Focus on Energy. Some Trade Allies reported learning about changes from customers or in the field before Focus on Energy informed them. They also said they did not want to comb through a lot of information or attend trainings or presentations not relevant to them. Some Trade Allies expressed low satisfaction with the existing call center and ability to reach a person who could help them.

Recommendation 4. Focus on Energy should explore ways to personalize and tailor communications to Trade Allies’ interests. For example, Focus on Energy should consider issuing a modular newsletter tailored to Trade Allies’ specialties, and a separate 800 number for Trade Allies to call. For effective outreach, the Administrator, and the Implementer should inform Trade Allies in advance of Program changes.

Outcome 5. Trade Allies need more support and information from Focus on Energy to help them overcome customers' financial barriers to participation. All respondents within this evaluation said that the most significant barrier to Program participation is the financial burden of investing in new equipment, including upfront costs and paybacks that are too long. Trade Allies said they want better tools, such as savings calculators, to help them show their customers the estimated payback period, return on investment, and expected bill savings.

Recommendation 5. The Implementer should help Trade Allies provide a stronger business case to customers. The Implementer should provide high-level estimated energy and dollar savings calculators, case studies, business savvy training, FAQ, and quick fact sheets to help Trade Allies better inform and motivate their customers to invest in energy efficiency.

Outcome 6. The Program design that incorporates a Trade Ally delivery model may not maximize the savings achieved in each participating facility. Trade Allies interviewed said they typically specialize in providing products and services in one area (most commonly lighting). Because many of the Trade Allies are not diverse in their offerings and expertise, they may not have the knowledge or training to identify additional opportunities for energy savings beyond their specialty in customer facilities.

Recommendation 6. Focus on Energy should explore opportunities to engage Trade Allies in the identification of additional energy savings opportunities in facilities they work with. Consider research to better understand how Trade Allies currently assess customer facilities and their willingness and ability to identify energy-saving opportunities outside their area of specialty. Test different concepts to motivate Trade Allies, for example by offering a referral bonus (or bounty), a bundling bonus for multisystem projects, audit training or improved audit tools, or other benefits. Focus groups with Trade Allies could provide useful insights about the feasibility of such a program and the appeal of different incentives.

Chain Stores and Franchises Program

The Chain Stores and Franchises Program launched on April 1, 2012. The Focus on Energy Commercial Program formerly served the customers that the Program targets—major retail, food service, and food sales chains and franchises, both national and regional. Focus on Energy created the Program to encourage these customers to implement energy-efficiency improvements in multiple locations. Therefore, Program participants must have a minimum of five locations in Wisconsin.

The Evaluation Team conducted both an impact evaluation and process evaluation of the Chain Stores and Franchises Program. The ex post verified gross savings for CY 2012 are 46,241,752 kWh and 602,158 therms. Carryover projects from Legacy Programs contributed 16% of the kWh savings and 1% of the therms saved.

M&V Approach

These were the key questions that directed the Evaluation Team's design of the M&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?
- What are other barriers specific to this Program and Segment?
- How is the Program leveraging the current supply chain for Program measures and what changes can increase the supply chain's support of the Program?
- What is customer satisfaction with the Program?

The Evaluation Team investigated gross and net energy and demand impacts, program operations, and successes and areas for improvement from the first nine months of the Chain Stores and Franchises Program operation. The Evaluation Team used the data collection activities and sample sizes listed in Table 116.

Table 116. Chain Stores And Franchises Program Data Collection Activities And Sample Sizes

Activity	Evaluation Area	Sample Size (n)	Relative Precision at 90% Confidence
On-Site Measurement And Verification	Impact	32	±11%[1]
Project Audit of Measures Installed[2]	Impact	31	±11%[1]
Stakeholder Interviews[3]	Process	8	N/A
Materials Review	Process	N/A	N/A
Participant Customer Surveys[4]	Impact and Process	50	±10%
Participant Trade Ally Interviews[5]	Process	14	Qualitative
Nonparticipant Trade Ally Interviews[6]	Process	27	Qualitative

[1] The Evaluation Team calculated the relative precision levels at the aggregate level, combining the project audit/impact participant survey sample with the on-site measurement and verification sample. The precision reported represents the relative precision for three Nonresidential programs combined.

[2] The total number of completed project audits represents the total number of records sampled. To ensure proper weighting by realization rate savings, the Team merged multiple measures of the same category for a given application, thereby reducing the effective number of sample points.

[3] Stakeholders interviewed: Program Administrator Program Manager; Program Implementer's Program Manager, Energy Advisors and Engineers, Project Specialist, Project Coordinators, and Lighting Consultant.

[4] Participant customers had active or completed projects in the Program database as of January 12, 2013.

[5] Participant Trade Allies have registered since April 1, 2012, or the Program Administrator designated them as active but not registered.

[6] Nonparticipant Trade Allies are in the legacy database but have not re-enrolled since April 1, 2012, and did not appear on the Program Administrator's list of active non-enrolled Trade Allies.

For the impact evaluation, the Team conducted project audits, impact participant surveys, and on-site measurement and verification. The Evaluation Team selected a stratified random sample of projects for project audits and participant surveys. 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 and feasibility studies;
- Customer metered data;
- Invoices for equipment or contracting services; and
- Any other documentation submitted to Focus on Energy.

After project audits, the Evaluation Team conducted participant surveys using e-mails and phone calls to follow up with the audited customers and collect information that was not available through SPECTRUM documentation.

The Evaluation Team selected an independent sample and conducted on-site measurement and verification, with a focus on high-priority measure groups and measure groups with highly uncertain

savings. The Evaluation Team identified high-priority measure groups based on their contribution to the savings. The Team initially identified high-priority measure groups using the cost-effectiveness calculator, and subsequently verified by analyzing the CY 2012 program database.[58] The Team also determined the high-priority measure groups jointly for the Business Incentive, Large Energy User, and Chain Store and Franchises Programs, resulting in the high-priority measure groups being the same for each program. The Team made this determination recognizing that Focus on Energy standardized its eligibility requirements, measure specifications, and incentives across the three programs.[59]

In addition to facilitating the verification of energy impacts, these on-site measurement and verification visits enabled the Team to gather data for evaluating critical program delivery components, such as savings input assumptions and any discrepancies between verified savings and reported savings.

Table 117 lists a summary of activities the Team completed for the CY 2012 program by measure group.

Table 117. Chain Store And Franchises Program Impact Activities By Measure Group

Measure Group	Project Audit	On-site measurement and verification	Total Analyses
HVAC	2	1	3
Lighting	10	15	25
Other[1]	10	10	20
Process	1	0	1
Refrigeration	8	6	14
GRAND TOTAL	**31**	**32**	**63**

[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 the purpose of evaluation because their relative contribution to the overall program was small.

Table 118 lists the measure groups and their savings contribution to the Chain Store and Franchises Program for CY 2012.

[58] This definition of "high-priority measure" was established through the 2012 PSEPs and is different from the definition set forth in the 2011 evaluation.

[59] This methodology resulted in high-priority measure groups that would not have been high-priority for an individual program. Similarly, high-priority measure groups for an individual program were not always identified as high priority with the three programs combined. The Evaluation Team will revisit high-priority measure groups for the CY 2013 and CY 2014 evaluations based on historical information.

Table 118. Nonresidential Measure Groups And Chain Stores And Franchises Gross Program Savings Contribution[1]

Measure Group	% of kWh Savings	% of KWSavings	% of Therms Savings
Boilers and Burners	0%	0%	10%
Building Shell	0%	0%	0%
Compressed Air, Vacuum Pumps	1%	1%	2%
Domestic Hot Water	12%	23%	64%
Food Service	0%	0%	4%
HVAC	7%	1%	14%
Information Technology	3%	2%	0%
Lighting	35%	39%	0%
Other	0%	0%	0%
Process	0%	0%	0%
Refrigeration	41%	34%	5%
Grand Total	**100%**	**100%**	**100%**

[1] The Evaluation Team did not sample these measure groups for the Chain Stores and Franchises Program: Boilers and Burners; Building Shell; Compressed Air, Vacuum Pumps; Food Service; Information Technology; Other; and Process.

The Evaluation Team obtained input from the Program stakeholders, customers, and Trade Allies (as shown in Table 116) and investigated gross and net energy and demand impacts, program operations, and successes and areas for improvement from the first nine months of the Chain Stores and Franchises Program operation. The Evaluation Team used the data collection activities and sample sizes listed in Table 116 and analyzed data from the SPECTRUM database as part of its process evaluation. The Team conducted telephone interviews with stakeholders and Trade Allies from November, 2012, through February, 2013. St. Norbert's Center for Strategic Research conducted the participant customer surveys by telephone in February 2013.

Impact Evaluation

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. Some carryover projects approved in the prior Legacy Programs and completed after the new programs launched in April 2012, were included in the sample design.[60] The Team calculated realization rates at the measure level using savings-weighted

[60] The SPECTRUM data extract identified carryover projects as assigned to the new programs. The Team later recognized that the projects were approved and initiated under previous program designs, and learned they could be identified through use of a different data field. Carryover project findings were not applied to projects initiated in the new programs.

averages across the three major nonresidential programs, resulting in identical measure-level realization.[61]

The Evaluation Team multiplied the measure-level program gross savings by the corresponding measure-level realization rate to arrive at the total program verified gross savings. Since these realization rates were calculated using only current program projects, the Evaluation Team only applied the realization rates to the corresponding current program projects.

The measure-level realization rates are summarized in Table 119.

Table 119. Chain Stores And Franchises Program Realization Rates For Current Measures

Measure Group	Realization Rate		
	kWh	KW	Therms
Boilers and Burners[1]	-	-	96%
Building Shell	-	-	100%
Compressed Air, Vacuum Pumps	95%	119%	100%
Domestic Hot Water	94%	80%	100%
Food Service	94%	80%	100%
HVAC	93%	83%	100%
Information Technology	94%	80%	-
Lighting	107%	101%	-
Other	94%	80%	-
Process	123%	-	-
Refrigeration	94%	97%	100%

Table 120 shows separate weighted average realization rate for the Chain Stores and Franchises current program measures and carryover measures. [62] While realization rates are identical across each of the three major programs, they are weighted differently for each individual program due to the differing relative contribution of savings by each measure group, resulting in differing program realization rates.

Table 120 shows the program-level realization rate in KW, kWh, therms, and MMBtu.[63]

[61] Note that measure-level realization rates are not intended to reach 90/10 confidence and precision levels until the Evaluation Team completes three full years of evaluation and combines the results across the three major Nonresidential programs (i.e., Business Incentive, Large Energy User, and Chain Store and Franchise).

[62] This roll-up method influences the realization rate calculation. In this case, the Team applied standard measure-level realization rates to each program. If realization rates were rolled up at the program-level instead of at the measure-level, the final weighted average realization rate would differ. This would also reduce relative precision levels because the number of sample points per measure per program would decrease.

[63] MMBtu is calculated by converting kWh to MMBtu by multiplying kWh by 0.003412 and converting therms to MMBtu by multiplying therms by 0.1 and summing the result.

Table 120. Chain Stores And Franchises Program Realization Rate

	Realization Rate			
	kWh	KW	Therms	MMBtu Total
Current	98%	94%	99%	99%
Carryover	104%	123%	163%	105%
Total	99%	98%	100%	99%

Gross and Verified Gross Savings

Table 121 lists the gross and verified gross savings.

Table 121. Chain Stores And Franchises Program Gross Savings Summary

	Gross			Verified Gross		
	kWh	KW	Therms	kWh	KW	Therms
Current Annual	39,655,387	5,405	602,212	39,034,912	5,094	598,899
Current Lifecycle	471,935,940	5,405	6,814,026	464,618,600	5,094	6,769,498
Carryover Annual	6,905,316	752	1,995	7,206,841	923	3,259
Carryover Lifecycle	83,901,969	752	29,925	87,199,403	923	48,882
Total Annual	**46,560,704**	**6,156**	**604,207**	**46,241,752**	**6,017**	**602,158**
Total Lifecycle	**555,837,908**	**6,156**	**6,843,951**	**551,818,002**	**6,017**	**6,818,380**

Net-to-Gross Analysis

The Chain Store and Franchises Program Evaluation Plan states that the Evaluation Team planned to use the Standard Market Practice (SMP) method to calculate net savings. This evaluation design relied on the completion of the baseline study, which was not available for the CY 2012 Evaluation Report.

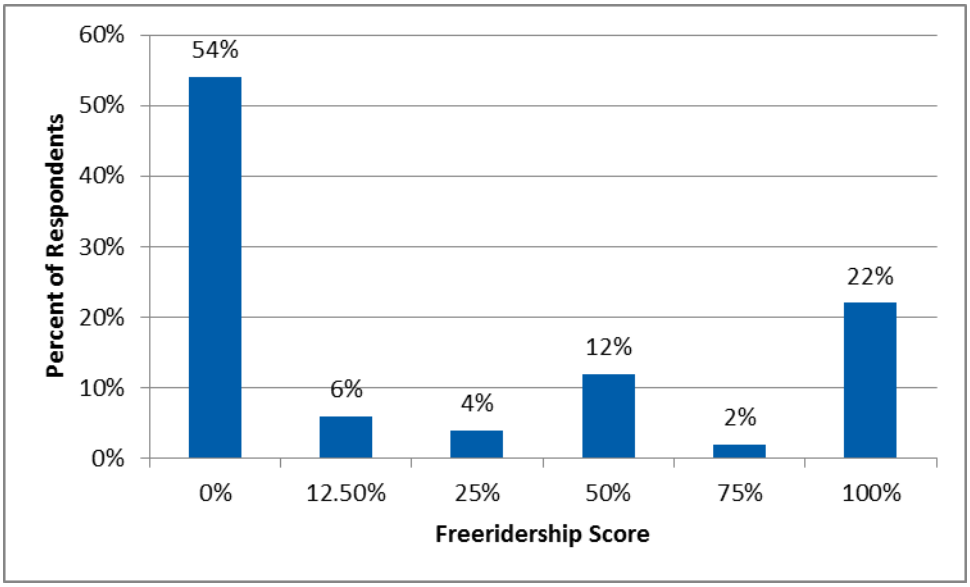
As an alternative to the SMP method, the Evaluation Team asked a series of questions to determine freeridership and spillover in the participant survey.[64] Further information on the freerider scoring methodology and calculation of spillover appears in Appendix P.

Freeridership Findings

Freeriders are program participants who would have purchased the same efficient measure at the same time without any influence from the Program. The Team derived the participants' freeridership score by translating their survey responses into a matrix value and then applying a consistent, rules-based calculation to obtain the final freeridership score. Figure 39 shows the Evaluation Team's estimates of the distribution of freeridership estimates assigned to individual participant responses. The majority of 2012 Program participants were not freeriders.

[64] See Appendix M, G1–G14 and H1-H7 in the Chain Stores and Franchises Program participant survey instrument.

Figure 39. Chain Stores And Franchises Freeridership Distribution By Estimate



Overall, the Program had an average freeridership of 19% across all respondents, after weighting survey responses for each measure by the Program population; the Team evaluated gross energy savings distribution for the measure type and overall Program. Similar measures are grouped by type where the sample size is sufficient. The "other" category includes commercial fryers, boiler tune-ups, a furnace and an industrial application using compressed air heat recovery. The Team did not find specific measures with consistently high free-ridership.

Table 122. Chain Stores And Franchises Freeridership Estimates

Program Measure Type	n	Freeridership Estimate	Absolute Precision	Population Savings Weights
Lighting	19	2%	± 16%	26%
Refrigeration	22	19%	± 13%	29%
Other	9	28%	± 25%	45%
Overall	50	18.83% [1]	± 10%	100%

[1] Weighted by program population evaluated gross energy savings distribution

Spillover Findings

Spillover results when customers invest in additional efficiency measures beyond those rebated through the program. Two survey respondents indicated that their participation in the Chain Stores and Franchises program was "very influential" in their decisions to take additional energy-efficient actions (Table 123).

Table 123. Chain Stores And Franchises Spillover Measures

Measure Name	Quantity	Per Unit MMBTU Savings	Total MMBTU Savings
T8 Lighting	100	0.0613	6.14
Fluorescent Spotlights	48	1.7183	82.48
Total			88.62

As shown in Table 124, the Team estimated spillover as 0.43% of Chain Stores and Franchises survey sample program savings.

Table 124. Chain Stores And Franchises Spillover Estimate

Program Measure Type	Survey Sample Spillover MMBTU Savings	Survey Sample Program MMBTU Savings	Program Savings Weights	Spillover % Estimate
Lighting	6.1	7,673	26%	0.08%
Refrigeration	82.5	5,829	29%	1.42%
Other	0	2,403	45%	0.00%
Overall	88.6	15,904[1]	100%	0.4%[2]

[1] 2012 Evaluated gross energy savings.
[2] Weighted by program population evaluated gross energy savings distribution.

This yielded an overall net-to-gross estimate of 82% for the Chain Stores and Franchises Program. Table 126 shows the net-to-gross estimates by measure group and by overall total for all measure groups. The Team notes the CY 2012 net-to-gross estimates are noticeably higher than prior findings in Wisconsin, for example with an net-to-gross of 98% for lighting measures, as shown in Table 126, compared to 60% applied in CY 2011, as shown in Table 125.[65]. The estimates are on the high end of the range of net-to-gross findings observed in other nonresidential programs, however direct comparisons can be difficult. In the past, Focus on Energy has identified freeridership as a specific area for improvement; however, the data available in CY 2012 was not sufficient to determine if actions taken may have contributed to this improvement.

Table 125. 2011 Chain Stores And Franchises Program Carryover Net-To-Gross Rates (MMBTU)

Measure Name	Net-to-Gross (MMBTU)
Boilers and Burners	100%
Compressed Air	60%
HVAC	45%
Lighting	60%
Other	100%
Process	59%
Refrigeration	48%

Table 126 shows the net-to-gross estimates by measure group and by overall total for all measure groups. The overall net-to-gross ratio equals 82% and is the weighted average on a MMBTU basis.

[65] Stipulated net-to-gross ratios used in CY 2011 were based upon the results of the 2010 evaluation work.

Table 126. 2012 Program Freeridership, Spillover, And Net-To-Gross Estimates by Measure

Measure Type	Freeridership	Spillover	Net-to-Gross
Boilers and Burners	28%	0%	72%
Compressed Air	28%	0%	72%
HVAC	28%	0%	72%
Lighting	2%	0%	98%
Other	28%	0%	72%
Process	0%	0%	100%
Refrigeration	19%	1%	82%
Overall	18.8%	0.4%	82%[1]

[1] Weighted by program population evaluated gross energy savings distribution.

Net Savings

Table 127 shows the net energy impacts (kWh, KW, and therms) for the Chain Stores and Franchises Program. The savings provided below are attributable to the Program net of what would have occurred without the Program.

Table 127. Chain Stores And Franchises Program Net Savings

		Verified Net		
		kWh	KW	Therms
Current	Annual	33,395,793	4,386	432,195
	Lifecycle	397,992,768	4,386	4,887,429
Carryover	Annual	3,640,551	468	1,466
	Lifecycle	43,933,058	468	21,997
Total	**Annual**	**37,036,344**	**4,854**	**433,662**
	Lifecycle	**441,925,827**	**4,854**	**4,909,425**

Process Evaluation

Key Research Questions

The process evaluation assessed the efficiency and effectiveness of the newly launched Program. The evaluation addressed these key researchable questions:

- Are Program operations congruent with the Program's design intent and implementation plan?
- Are Program operations efficient?
- How effective are the Program's marketing, outreach, and communication efforts?
- How effective are the Energy Advisors at generating participation?
- How effectively is the Program managing and leveraging the Trade Ally network?
- Are the Program Administrator and Implementer coordinating Program activities effectively?
- Are customers and Trade Allies satisfied with the Program?
- What are the barriers to increased customer participation, and how effectively is the Program overcoming these barriers?

- Is data tracking and project monitoring sufficient for measuring the Program's performance?
- How can the Program cost-effectively increase energy and demand savings?

Program Design and Goals

Transition to New Design

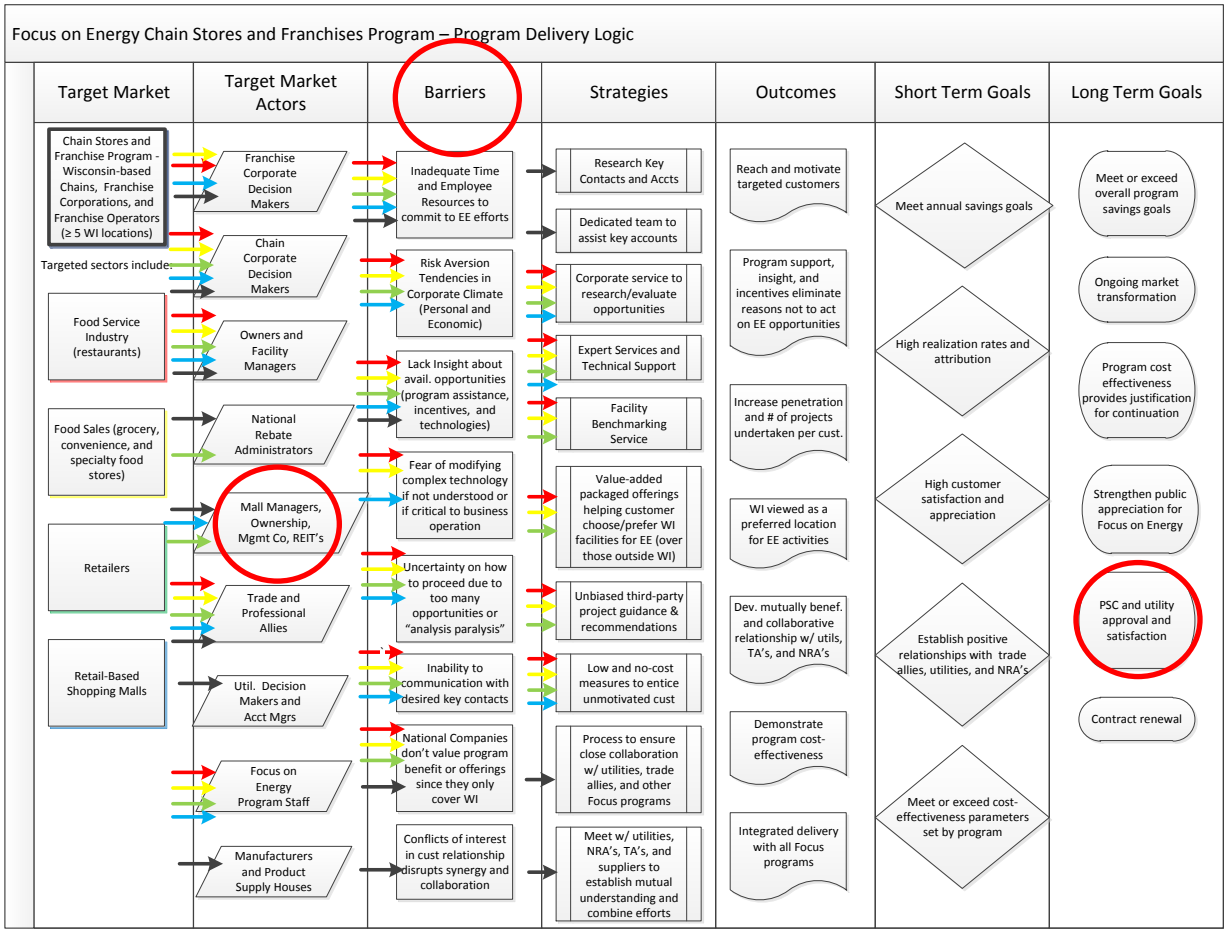
Program stakeholders said that the transition from the previous to the new Program confused customers, Trade Allies, and utilities. According to the Program Implementer, many of these market actors had difficulty determining which Program was appropriate for a particular project. Some also believed the programs within Focus on Energy would not continue after April 1, 2012. The Program Implementer expressed concern that further change to the Program would cause additional confusion.

Program Logic

In its review of Program materials, the Evaluation Team observed the following items were missing in the Program's logic model (Figure 40):

- The model identifies "Mall Managers, Ownership, Mgmt Co, REITs" as "Target Market Actors," but does not identify specific strategies to reach these actors.
- The "Barriers" section does not mention financial constraints (such as cost premium or lack of funding) as a barrier, yet cost is a typical barrier for energy-efficiency projects. In the process evaluation, both customers and Trade Allies cited financial concerns as a major barrier.
- The model identifies "PSC and utility approval and satisfaction" as "Long Term Goals," but the Evaluation Team did not observe specific metrics or targets to measure the Program's success in meeting this goal.

Figure 40. Chain Stores And Franchises Logic Model[1]



[1]Red circles added to emphasize missing items in Program's logic model.

Source: Chain Stores and Franchises Operations Manual v2.0; red circles added by the Evaluation Team to indicate areas of commentary.

Eligible Measures

The Program's selection of eligible equipment received a lower customer satisfaction rating than any other Program element. Although 66% of the 50 respondents were "very satisfied" with the Program overall, their satisfaction with the selection of eligible equipment was lower, with:

- 47% "very satisfied";
- 49% "somewhat satisfied";
- 4% "not too satisfied".

As shown in Table 128, participants suggested several additions to the Program's eligible equipment list. Some wanted an expanded menu of options within a general category; others requested specific additional items.

Table 128. Customer Suggestions For Additional Eligible Equipment

General Categories	Specific Items
Lighting (five respondents)	Inverters for manufacturing equipment
Refrigeration Doors (three respondents)	Open-air bunkers and coolers
HVAC (three respondents)	Solar power cogeneration
LEDs (two respondents)	Solar tube cans
Control systems	
Fluorescent lights	
Insulation	
Refrigeration	

The Program offers prescriptive incentives in many of the general categories listed in Table 128 above. Customers can participate in the Renewable Energy Competitive Incentive Program for solar measures. Details about the specific technologies within these general categories that customers would like the Program to include and awareness of other programs are an item for future research.

Seven of the 14 Chain Stores and Franchises Trade Allies interviewed also recommended an updated product list. Most of their suggestions were for light-emitting diode (LED) products:

- LED exterior retrofit kits
- LED exit fixtures
- LEDs for medium-temperature refrigeration (such as fresh meat cases)
- LED 2x2s and 2x4s
- Poweramp® loading dock products
- Renewables

Program Incentives

The Program Administrator and Implementer reported that the Program's rebates are "middle of the road" compared to program rebates offered by other states. The Program caps its incentives at 30% of project cost. However, one Trade Ally cited an example of a rebate that covered only 4% of product cost. Ten of 12 Trade Allies recommended improvements to the Program's incentives: higher incentives in general (five respondents), higher rebates for LED products specifically (two respondents), and project financing (three respondents).

The Evaluation Team compared the Program's rebates to comparable programs in other states. Table 129 shows the rebate amounts offered by various utility programs for the three measures most commonly used in CY 2012 Program projects.

Table 129. Prescriptive Business Program Rebate Comparison[1]

Utility/Program	Anti-sweat Heater Controls	ECM Evaporator Fan Motor, Walk-in Cooler	ECM Motor, Cooler/ Freezer Case
Focus on Energy Chain Stores and Franchises	$40 per door	$30-$60 per motor	$30 per motor
Ameren Illinois Specialty Equipment Rebates	$80 per door	$25 per motor	$25 per motor
Ameren Missouri Standard Refrigeration Rebates	$80 per door	$40 per motor	$40 per motor
Pepco Maryland Prescriptive Rebates	$40 per door	$50 per motor	$50 per motor
Georgia Power Prescriptive Rebates	$15 per door	N/A (Custom only)	N/A (Custom only)
Progress Energy Carolinas Energy Efficiency for Business	$20 per linear foot	$50 per motor	$40 per motor
PG&E Business Rebates	$25 per linear foot	$50 per motor	$35 per motor
Southern California Edison Express Solutions	$25 per linear foot	N/A (Custom only)	$35 per motor

1 Source: Focus on Energy Website, http://www.focusonenergy.com/; Ameren Illinois Business Rebates Website, http://www.actonenergy.com/for-my-business; Ameren Missouri Website, http://www.ameren.com/sites/AUE/UEfficiency/businessenergyefficiency/Documents/BizSavers/StandardIncentive2013.pdf; Pepco Maryland Website, https://cienergyefficiency.pepco.com/; Georgia Power Website, http://georgiapower.com/earthcents/business/; Progress Energy Carolinas Website, https://www.progress-energy.com/carolinas/business/save-energy-money/energy-efficiency-for-business.page; PG&E Business Rebates Website, http://www.pge.com/en/mybusiness/energysavingsrebates/rebatesincentives/index.page; Southern California Edison Website, https://www.sce.com/wps/portal/home/business/savings-incentives/express-solutions.

Program Goals

The Evaluation Team's interviews with stakeholders and its review of Program documents revealed these qualitative goals for the Program: 1) to transform the market, 2) ensure Wisconsin PSC and utility approval and satisfaction, and 3) pioneer a nationally recognized program for high-profile retailers. However, no data were available to assess how well the Program is progressing toward these goals.

Program Management and Delivery

Roles and Responsibilities

The Program Implementer's Program Manager oversees administrative functions and ensures the Program meets its goals. The Program Manager also oversees the Energy Advisors and Energy Engineers who recruit and support customers, and a Project Specialist and project coordinators who provide administrative support. The Program also has a lighting consultant to provide expert technical advice.

In 2012, some Implementer staff worked on both the Business Incentive and Chain Stores and Franchises Programs. The Program Administrator and Implementer said that these staff spent more time on the Business Incentive Program than expected, which was detrimental to the Chain Stores and Franchises Program. To correct this problem, the Implementer assigned each staff member to one of the two programs in January 2013. Within the Chain Stores and Franchises Program, the Implementer assigned Energy Advisors to market segments (retail, food sales, or food service) rather than individual customers.

Program Materials

The Evaluation Team reviewed the Program Operations Manual and other Program documents, internal procedures and protocols, Trade Ally-oriented materials, and the Program Website and online Fact Sheet. The Team found these documents met or exceeded industry best practices, in terms of thoroughness, completeness, and ease of use. (The materials review process is detailed in Appendix L.)

Program Outreach and Marketing

According to stakeholders, the Program mainly relies on its Energy Advisors and other Implementer staff for customer outreach. Stakeholders emphasized the challenges of engaging decision-makers at major national and regional chains, particularly if the company's headquarters is located outside Wisconsin. In 2012, the Implementer attended the Edison Electric Institute National Key Accounts Fall Workshop in order to reach multiple retail decision-makers at one venue. One attendee said the conference yielded many valuable contacts.

The Implementer understands that many Program customers work with National Rebate Administrators (NRAs). As a result, they instituted a monthly call with three major NRAs to build relationships and promote the Program over similar programs outside Wisconsin. According to the Implementer, discussions with NRAs indicated that the Program has less restrictive eligibility requirements, offers faster incentive payment, and has better customer service than similar programs elsewhere, making it a high priority utility territory for the NRAs to suggest to their clients, even though the lucrativeness of the incentive offerings were "middle-of-the-pack" on a national scale .

Stakeholders also reported that the Program informally uses utility account managers to recruit participants. One interviewee noted that many of the Implementer's staff members have historical relationships with account managers, but that no formal joint recruiting protocols exist.

Program and Trade Ally Outreach to Customers

In addition to direct contacts and networking, the Program employed five major outreach initiatives in CY 2012. The Implementer views these efforts as having varying degrees of success.

Table 130. Chain Stores And Franchises Program Year 2012 Major Outreach Initiatives

Outreach Name	Outreach Effort	Outreach Result
Customer Care Package Mailing	The Implementer selected quick-service restaurants and sent a "customer care package" (faucet aerator and spray-nozzle aerator).	Installation rate of approximately 10%; contributed significantly to helping the Program meet revised therms goals for CY 2012.
Direct Install Outreach Effort	The Implementer instituted a direct install initiative to generate cost-effective energy savings and build awareness.	Effectiveness not yet evaluated. One respondent described the initiative as the Program's "accelerator pedal."
Rooftop Optimization Offering (RTO)	The Program Implementer launched the RTO offering in July and intended it to be the Program's primary strategy to promote natural gas savings. RTO replicated a similar initiative from Oregon, including an enhanced tune-up checklist that specified required analyses and tasks.	Three problems limited the RTO offering's success: 1. A perception that the enhanced tune-up's required analyses and tasks were overly time-consuming eroded support for the offering among Trade Allies.[1] 2. RTO marketing materials were not available until October, which meant losing most of the pre-heating season. 3. Most HVAC tune-ups occur in spring and fall, just before the cooling and heating seasons; RTO launched in July.
Refrigeration Makeover Mailing	In late 2012, the Program Implementer conducted a direct mail campaign to promote comprehensive refrigeration redesign with electronically commutated motors (ECMs).	According to the Program Administrator, the campaign did not meet expectations for increased ECM installations before the end of the calendar year. One respondent expressed concern about the caliber of the marketing materials created for the campaign.
Competitive Energy Efficiency Initiative	In late 2012, the Program Implementer launched the Competitive Energy Efficiency Initiative (CEEI) to get national chain attention and motivate Trade Allies to find big projects. Under the CEEI, customers can submit a project proposal and request incentives up to 50% of project costs, compared with 30% for standard the Program incentives.	The Evaluation Team will assess the results of this initiative in 2013.

1 Stakeholders reported that the Program streamlined the RTO enhanced tune-up requirements and divided the original checklist into three system-specific checklists (for heating, cooling, and chillers) as of April 1, 2013.

Website and Collateral Materials

The Program's Web page and overview fact sheet are its primary marketing collateral. Based upon the Evaluation Team's review, the Program's Web page is easy to reach with two clicks from the Focus on Energy homepage. The two-page overview fact sheet includes key Program details, contact information, and a graphic that illustrates the Program process.

The Program Web page links to a list of application forms for all the Business Programs. This page has a large number of forms, and lacks a menu to guide users to the correct application. It also lacks information on procedures specific to the Program, such as the option to combine multiple sites on one application.

Participation Process and Experience

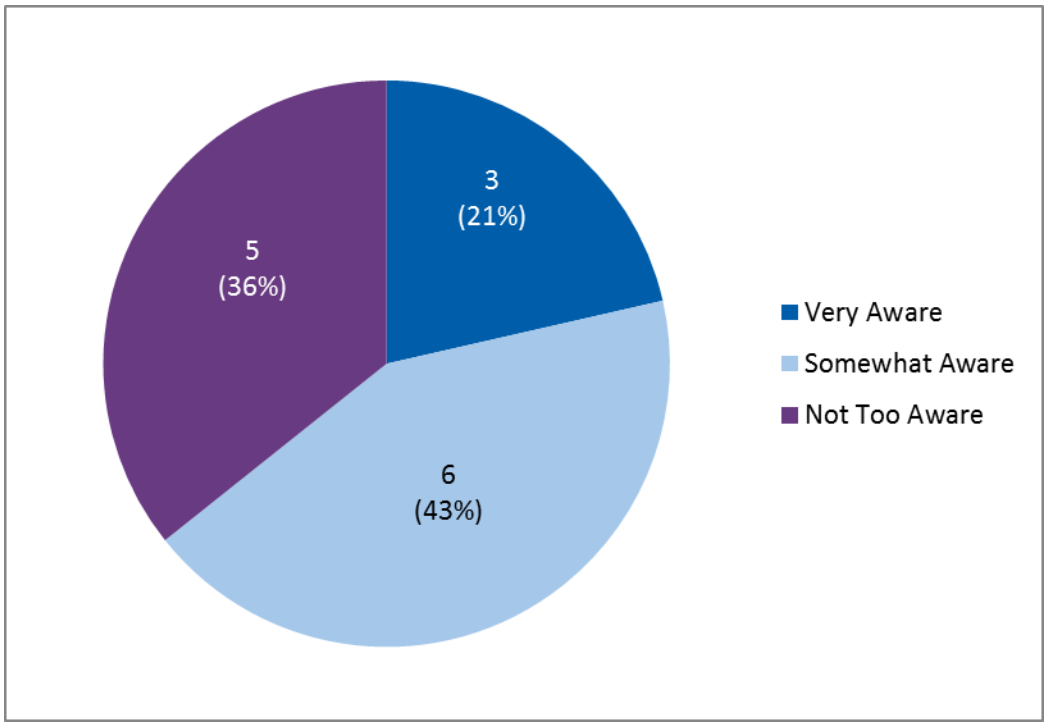
The Program's participating companies ranged in size from less than five to 2,000 employees; 62% of the companies had fewer than 100 employees. Among participating customers, one-half leased their properties, 46% owned them, and 4% had both leased and owned properties.

Customer Awareness

As shown in Figure 41, when Trade Allies were asked to assess customer awareness of the Program:

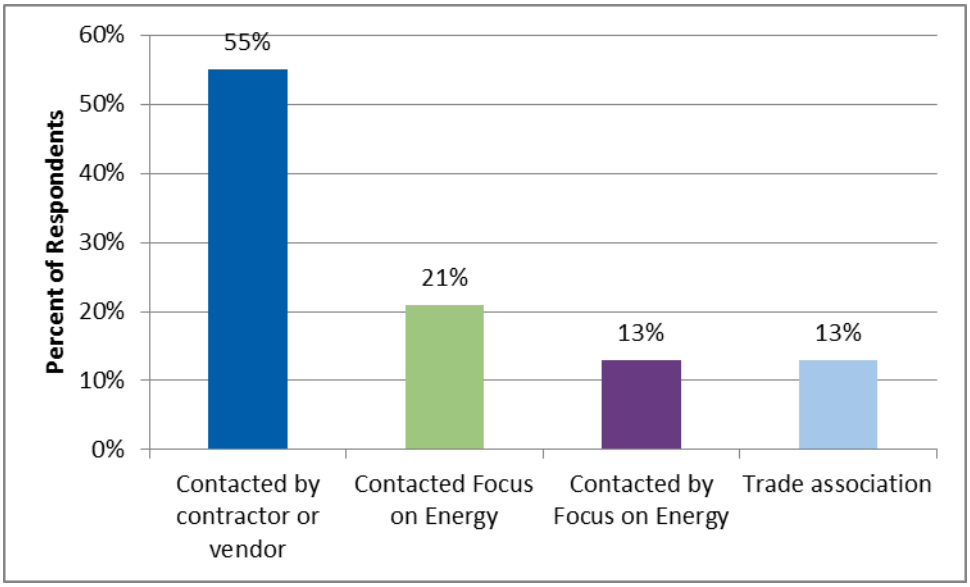
- 21% thought customers were "very aware";
- 43% said they were "somewhat aware";
- 36% thought customers were "not too aware".

Figure 41. Trade Ally Assessment Of Customer Program Awareness (n=14)



Of the 2012 participating customers surveyed, 55% said they learned about the Program from a contractor or vendor (Trade Ally). Figure 42 shows the four responses mentioned most often.

Figure 42. How 2012 Participants Learned About The Program (n=47)



Energy decision-makers, who are responsible for multiple locations, including locations outside Wisconsin, were less likely to have learned about the Program from contractors (two of 10). Six of these 10 decision-makers contacted Focus on Energy or their utility directly, or asked their vendor to find information about energy-efficiency programs. Two of the 10 said Focus on Energy contacted them.

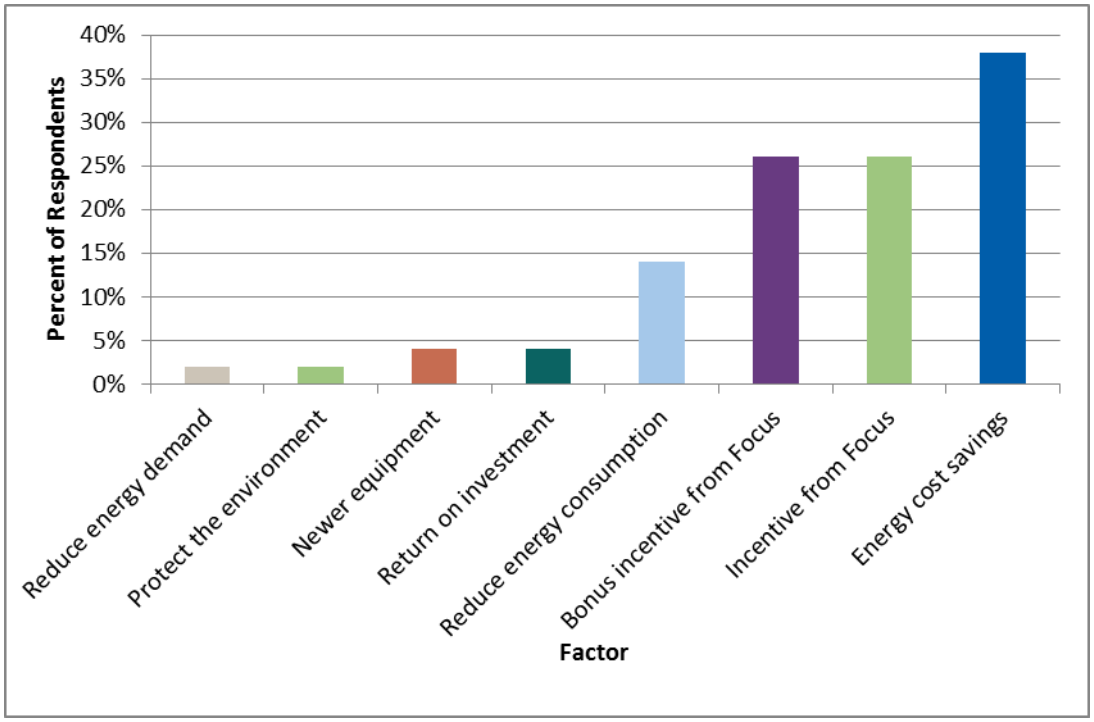
Trade Allies who participated in the Program suggested the following improvements in marketing and outreach:

- More awareness efforts
- Testimonials with in-depth information on successful projects
- Customer handouts on potential savings and payback
- Flyers that educate customers about changing and obsolete technologies

Customer Decision-Making

As shown in Figure 43, customers most often (38% of respondents) chose reduced energy costs as the most important factor in their decision to participate in the Program. About one-quarter of customers named Program incentives as the most important factor, and another one-quarter cited Program bonus incentives.

Figure 43. Most Important Factors In Customer Decisions To Participate (n=50)[1]

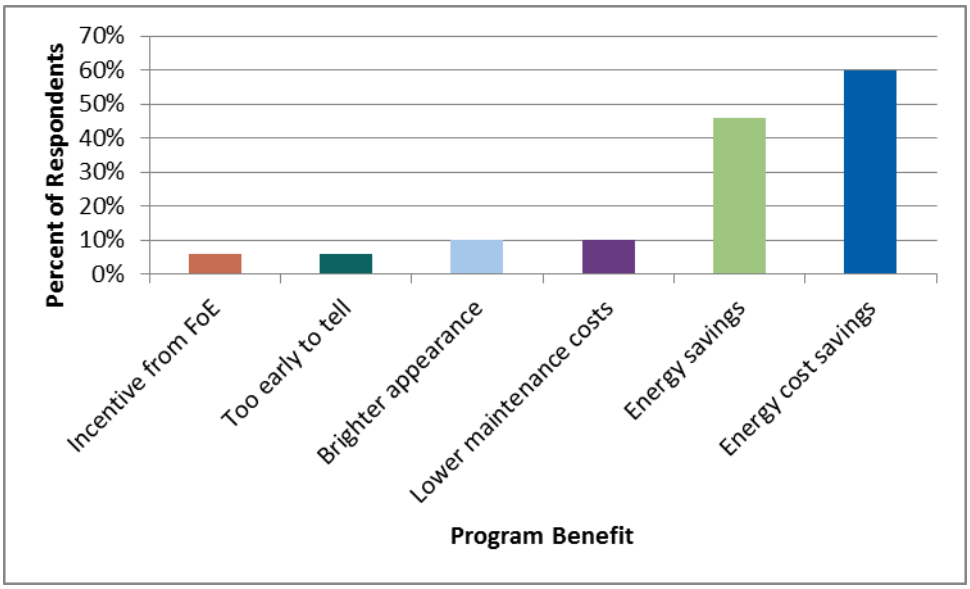


1 Percentages add up to more than 100% because the survey question allowed multiple responses.

Benefits for Customers

Figure 44 shows the Program benefits participants most frequently cited were reduced energy cost (60%) and energy savings (48%). About 10% of participating customers also cited lower maintenance costs and brighter facilities as benefits.

Figure 44. Program Benefits For Chain Stores And Franchises Customers (n=50)[1]

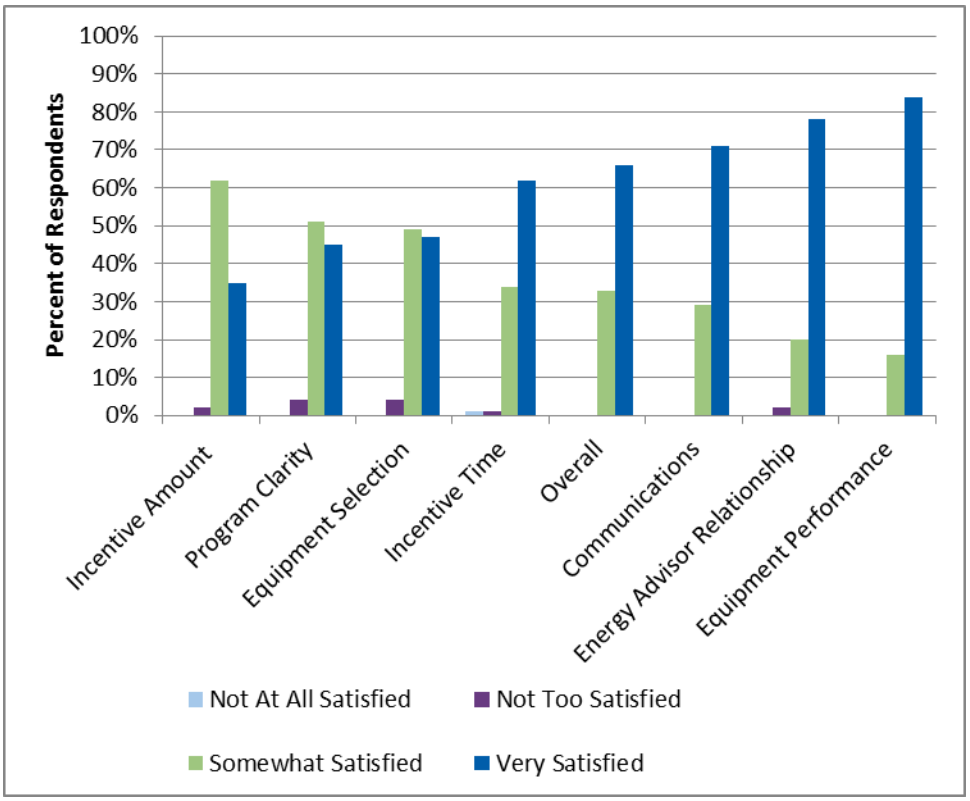


1 Percentages add up to more than 100% because the survey question allowed multiple responses.

Customer Satisfaction

As shown in Figure 45, customer satisfaction with the Program varied across Program elements. About two-thirds of respondents were very satisfied with the overall Program (66%); the rest were somewhat satisfied. Customers were especially satisfied with equipment performance (82% very satisfied). While 78% of respondents said they were very satisfied with their Energy Advisor, 20% could not rate this relationship, suggesting they did not know one.

Figure 45. Customer Satisfaction With Chain Stores And Franchises Program (n=50)

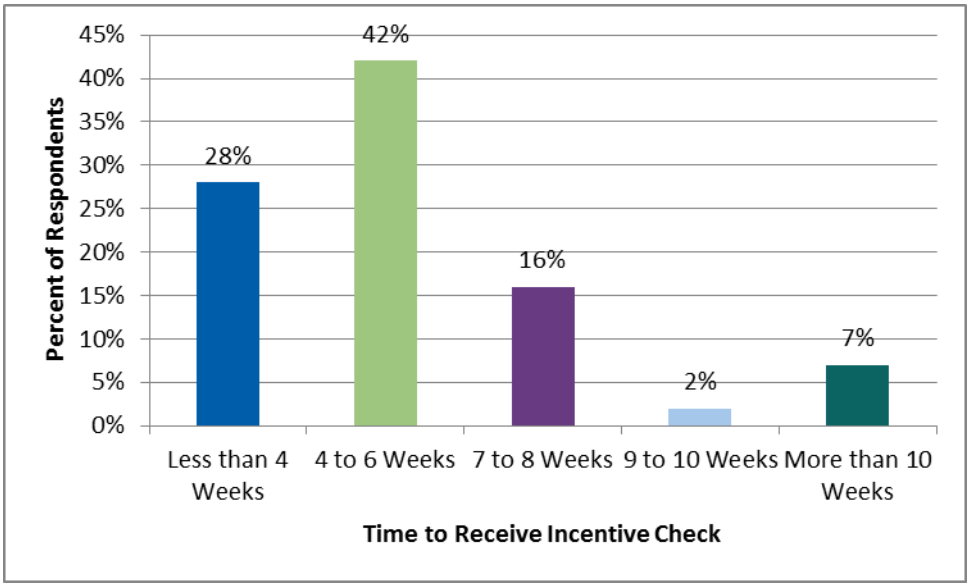


Customers were less satisfied with the length of time it took to receive their incentives, the clarity of application requirements, and the incentive amount than they were with other Program attributes.

The 12 Trade Allies interviewed also rated the clarity of the Program application lower than other Program features. Some Trade Allies commented that the application form was easy to use, but others said it was too long and cumbersome. When asked what would improve the Program, Trade Allies asked that project application forms are easier to understand and streamlined.

Figure 46 suggests why some participants were less satisfied with the timing of incentive payments. Seven percent of respondents said it took longer than 10 weeks.

Figure 46. Customer-Reported Time to Receive Incentive Check (n=43)[1]



1 A stakeholder reported that Focus on Energy tells customers to expect their incentive checks within 8-10 weeks.

The Program Implementer said that a lack of clearly defined review responsibilities in the incentive approval process was a possible reason for delays in processing time. According to the Program's Operations Manual, projects must proceed through an increasing number of reviews as the incentive amount rises.

The Implementer believes that each reviewer checks basically the same items, rather than systematically reviewing to a progressively stricter set of standards as incentive values increase. Guidelines for specific criteria at each approval threshold may be available in SPECTRUM; if so, users were not aware of it.

Barriers to Participation

Both participating customers and Trade Allies said high initial costs and long payback periods were challenges to making energy-efficient improvements in their businesses. High initial cost was the most significant challenge (66% of the 50 participating customers surveyed), followed by the long payback period (10%). Other barriers were:

- Lack of corporate support (two respondents)
- Changing technology (two respondents)
- Lack of technical knowledge (one respondent)
- Lack of staff time (one respondent)
- Focus on Energy paperwork (one respondent)
- Uncertainty of savings (one respondent)
- Business disruption (one respondent)

Ten of 15 Trade Allies surveyed identified limited funds or lack of capital as the most significant obstacle to installing energy-efficient equipment for the businesses they worked with. Two of the Trade Allies identified price, and two others identified the long payback period as significant obstacles.

Suggestions for Improvement

Twenty of 50 customer respondents surveyed offered ideas for how the Program could overcome barriers to installation of energy-efficient equipment. They suggested higher incentives, loans, and more rebate opportunities. They also suggested other improvements that were not related to cost barriers:

- More information
- Better communication
- Less complicated forms
- Streamline the process and provide a timeline for receiving the check
- Perform Program-related work outside of working hours to avoid business disruption
- Recommend more projects that a customer could complete under the Program

Data Management

The Program Administrator and Implementer manage Program data in three locations: Franklin's Customer Relationship Management (CRM) tool, individual Energy Advisor spreadsheets, and SPECTRUM. Stakeholders reported significant difficulties using SPECTRUM initially, including slowness, freezing, downtime for updating, and lack of a user-friendly interface. In follow-up conversations in February 2013, stakeholders reported that SPECTRUM performance had improved.

SPECTRUM has a CRM capability, but it is not yet functional. Both the Program Administrator and Implementer currently use other tools to track information about prospective customers and Trade Allies. The Implementer said integrating CRM functions into SPECTRUM would improve customer service by linking an application with associated inbound and outbound communications. The Program Administrator agrees that this integration would be valuable; no timeline yet exists to bring SPECTRUM's CRM functionality online.

Stakeholders cited two crucial gaps in SPECTRUM's current capabilities:

- It cannot notify the Program Administrator or Implementer Staff of key process events, such as when applications receive approval or if applications are not approved after a certain period of time.
- The application "ownership" structure within SPECTRUM prevents Energy Advisors from creating reports to track the progress of their customers' applications.

Program Quality Assurance and Verification

The Program's Operations Manual includes detailed QA/QC protocols, such as procedures tailored to the prescriptive and custom project paths, various project sizes, pre- and post-installation verification, and modified requirements for multisite projects. Although post-inspection guidelines are detailed and well-

defined, the Operations Manual does not clearly describe the requirements for pre-inspection sampling. Stakeholders did not identify any problems related to Program QA/QC and verification.

Trade Ally Network

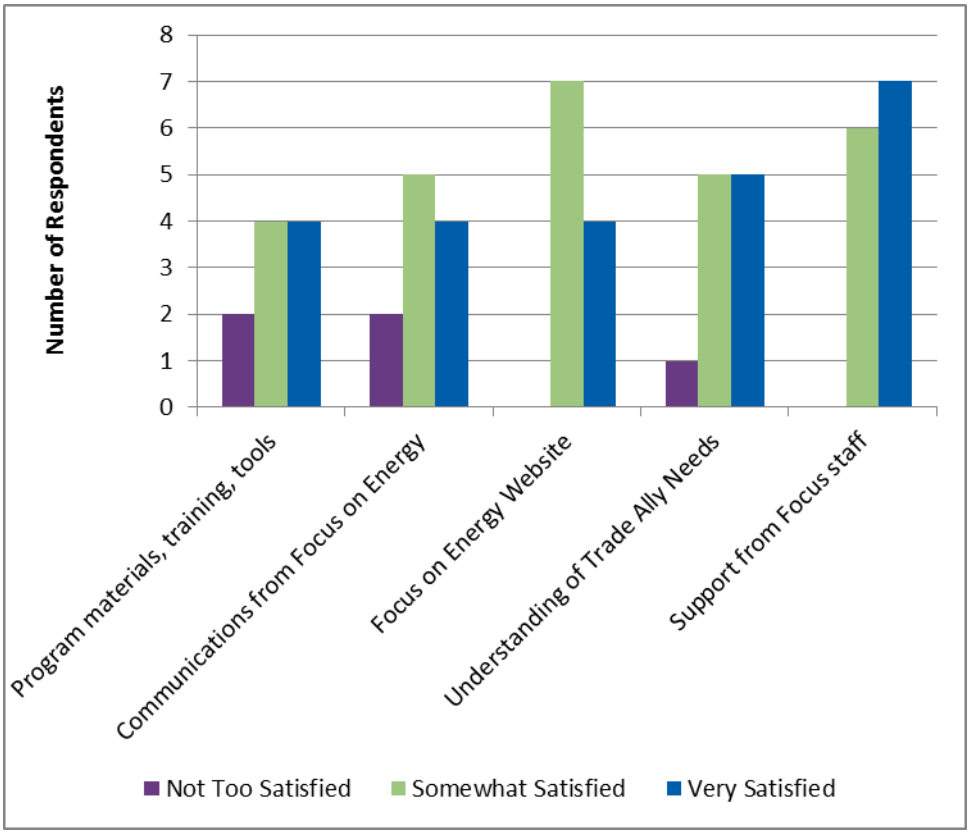
The Program Administrator coordinates management of the Trade Ally network among the Program Implementers in the Nonresidential Segment because Trade Allies often participate in multiple programs. The Evaluation Team interviewed 14 of the 30 Trade Allies who had participated in the Program about their interaction and satisfaction with the Program. Participating Trade Allies' companies ranged in size from one employee to 2,000 employees. Eleven of the Trade Allies completed less than 10 Program projects in CY 2012; three completed 10 or more. These projects represented the following areas of specialization:

- Lighting (eight)
- Lighting and refrigeration (one)
- Refrigeration (two)
- HVAC and refrigeration (one)
- HVAC (one)
- Industrial projects (one)

Trade Ally Satisfaction

Trade Allies who participated in the Program were less satisfied with it than participating customers. The only element of the Program with which more than half of Trade Allies were "very satisfied" was the support they received from the Program Implementer (see Figure 47).

Figure 47. Trade Ally Satisfaction With Administrator And Implementer Staff And Support (n=14)



Only four Trade Allies said they were very satisfied with communications from Focus on Energy; the Program's materials, training, and tools; and the Program Website. Trade Allies commented that Program e-mails were helpful in "shedding some light on new incentives;" however, they said they were frustrated when trying to reach a person directly. One said: "Focus is switching people all the time. It's confusing and hard to reach [the] right person."

Trade Allies expressed a need for a better understanding of the Program design and how to participate. The majority of the Trade Allies interviewed said they wanted more information in the following areas:

- Benefits for registered Trade Allies (10)
- How to apply for custom incentives (10)
- How to apply for prescriptive incentives (nine)
- The equipment included in the Program (eight)
- Customer qualification requirements (seven)

Participant Trade Allies also requested more in-person meetings, renewal notices when they need to re-enroll, more timely Program updates, updates on what has changed for CY 2013, and "any information that would speed up the custom rebate process."

Trade Allies gave the following comments about the support they received from Focus on Energy staff and about the Energy Advisors' understanding of their needs:

Positive Feedback

- *"Everybody was cordial and prompt."*
- *"I would call and ask questions. They were good at e-mailing and getting me what I needed."*

Other Feedback

- *"I don't have much support from the Program."*
- *"I only encounter them at seminars."*
- *"I contacted the call center looking for specifics. it may be a number of days before they get back to you."*
- *"Energy Advisors cover large areas; some are responsive, others not."*
- *"The paperwork is a hassle."*
- *"Computers simplify the procedure, but they are harder for me to understand. I'm making calls all day, so I'm away from a computer."*

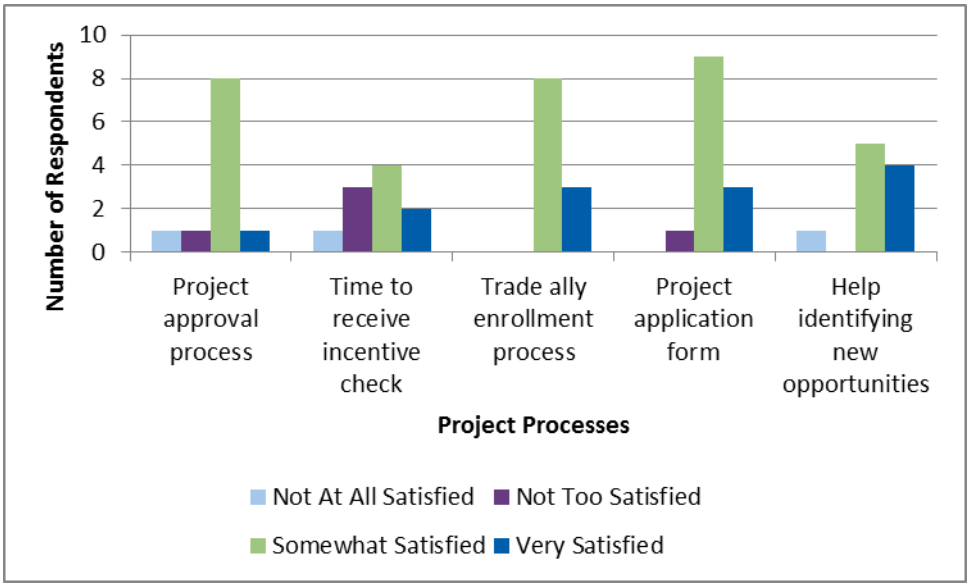
Specific Training and Materials

Most respondents were very satisfied with the half-day Trade Ally seminar and with visits from Focus on Energy staff to train them on the return-on-investment spreadsheet and LED installation procedures. One Trade Ally was "not too satisfied" with the Rooftop Optimization mini-program training, and another was "not too satisfied" with the Program's help with advertising. Surveyed Trade Allies requested the following additional training, materials, and tools:

- Materials to hand out to customers
- Information on completing Program paperwork
- Information on commercial and industrial refrigeration products eligible for the Program
- In-person seminars: "E-mail is not so good… I'm not around a computer during the day."

Trade Allies were less satisfied with Program processes (Figure 48) than with the Administrator and Implementer Staff and support (Figure 47). Relatively few were very satisfied with the application forms, approval process, and the time it took to receive incentive payments.

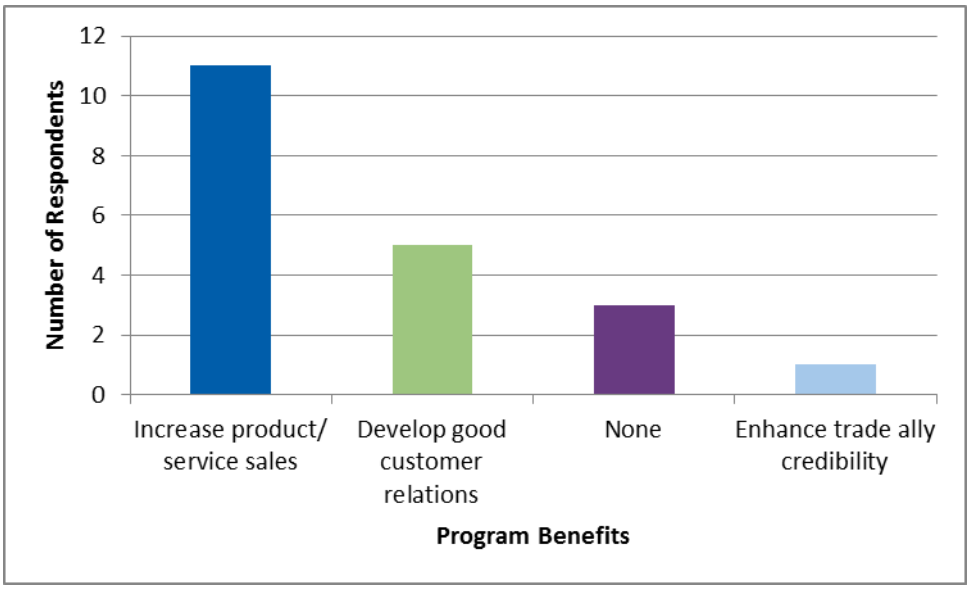
Figure 48. Trade Ally Satisfaction With Program Processes (n=14)



Benefits

Trade allies identified three benefits from participating in the Program (Figure 49): increased sales, better customer relationships, and more credibility for their businesses.

Figure 49. Trade Ally Reported Program Benefits (n=14)



Program Cost Effectiveness

The benefit cost (B/C) test, also known as a cost-effectiveness test, is used to compare the benefits of a demand side management program with the costs of the program. There are several tests used for evaluating energy efficiency cost-effectiveness. The benefit cost test used in Wisconsin is a modified

version of the total resource cost (TRC) test. This test is a commonly administered test for evaluating energy efficiency programs. A description of the test can be found in Appendix H.

The CY 2012 Chain Stores and Franchises Program, and Program carryover was found by the Evaluation Team to be cost effective (a TRC ratio above 1). Table 131 below provides the Chain Stores and Franchises Program costs and benefits:

Table 131. Chain Stores And Franchises Program Costs And Benefits

	Chain Stores and Franchises Program
Incentive Costs	$2,035,702
Administration Costs	$294,815
Delivery Costs	$1,203,852.67
Incremental Measure Costs	$17,086,287
Total Non-Incentive Costs	$18,584,955
Electric Benefits	$24,333,599
Gas Benefits	$4,345,772
Emissions Benefits	$10,158,694.99
Total TRC Benefits	$38,838,066
TRC Net Benefits	$20,253,111
TRC Ratio	2.09

Evaluation Outcomes and Recommendations

Impact Evaluation

The impact findings for the Chain Stores and Franchises Program and other nonresidential programs are summarized below in the Nonresidential Segment Measure-Related Recommendations section (Page 263).

Process Evaluation

Despite some start-up challenges, the Program experienced an upward trend in applications at the end of the year, and achieved relatively high customer satisfaction ratings, particularly for contractor quality.

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

Outcome 1. The Program lacks a strategy for working with building owners and their representatives where customers lease, rather than own, their space.

- The Program logic model identifies “Mall Managers, Ownership, Mgmt Co, REITs” as “Target Market Actors,” but does not identify specific strategies to reach these actors.
- The marketing plan does not include a strategy related to building owners.

Recommendation 1. Develop a strategy for marketing and outreach to building owners and their representatives.

- Conduct an analysis to identify key Wisconsin retail property owners and their property management companies, if applicable.
- Develop strategies and associated tactics to reach these key contacts, such as:
  - One-on-one outreach
  - Outreach through retail-oriented real estate industry associations like the International Council of Shopping Centers and the Building Owners and Managers Association
  - Consider offering a referral bonus to owners and property managers who persuade their tenants to participate in the Program.

Outcome 2. The Program needs to better compete with energy-efficiency incentives in other states where decision-makers look at opportunities in multiple states.

- Many national customers work with National Rebate Administrators (NRAs) that recommend how to allocate funds on a nationwide basis.
- Stakeholders said incentives are "middle of the road" compared to other states.
- The incentive amount had the lowest customer satisfaction of any program element.

Recommendation 2. Analyze the competiveness of Program incentives and target customer priorities as a basis to identify, test, and evaluate alternative incentive strategies.

- Benchmark incentives and Program design in states where target customers are active.
- Interview NRAs to identify where the Program could improve compared to other states.
- Identify measures for which the Program could cost-effectively increase incentive amounts to make them more competitive.
- Identify alternative incentive approaches based on Program priorities, customer needs, and nationwide best practices, such as:
  - "Bundle bonuses" for installing certain quantities or combinations of measures
  - Performance bonuses for projects that meet specified criteria for energy savings and cost effectiveness
  - Project financing
  - Select high-potential alternate incentive(s) to pilot on a small scale or for a limited amount of time.
  - Evaluate alternate incentive pilots and incorporate effective incentive formats into regular program offerings.

Outcome 3. Customers and Trade Allies want additional efficiency products in the Program.

- The selection of eligible equipment received relatively low customer satisfaction scores.
- Seven of 14 Trade Allies recommended additional products to include in the Program; four of the seven mentioned specific LED products.

Recommendation 3. Review the list of eligible measures, with particular emphasis on LEDs, and expand the list, if warranted. [66] Work with customers to help them understand the breadth of current Program offerings.

Outcome 4. New marketing and outreach initiatives need more pretesting.

- Multiple stakeholders said that modeling the Rooftop Optimization offering after a program from Oregon without sufficient vetting hindered RTO projects and eroded Program support among Trade Allies.
- One stakeholder attributed the fact that the Refrigeration Makeover mailing did not meet expectations to marketing materials that Administrator and Implementer Staff hurried to finish.

Recommendation 4. Take additional steps to support the success of new initiatives prior to full Program launch.

- Incorporate third-party expert review of new design elements and mini-programs.
- Create an advisory committee of Trade Allies to review and offer feedback.
- Consider piloting or soft-launching new initiatives on a small scale.

Outcome 5. Program outreach efforts to new regional and national chains have not yet delivered.

- Stakeholders said many of the CY 2012 Program participants were not new to Focus on Energy.
- Stakeholders said that engaging decision-makers at national chains is a challenge.
- 79% of participating Trade Allies said customers are somewhat or not too aware of the Program.

Recommendation 5. Consider tailoring and enhancing marketing and outreach strategies for large regional and national chains:

- Provide additional strategic account sales training for Energy Advisors.
- Create outreach plans for each market segment (retail, food service, food sales) with specific outreach strategies for local, regional, and national customers.
- Identify utility Key Account Managers with existing relationships with targeted customers, include them in planning and outreach strategies, create a formal plan to update them on projects their customers are undertaking.

[66] The Program added many (but not all) of the measures customers suggested to the Program on April 1, 2013.

- Create an executive account management strategy for the largest customers.
- Identify the most valuable trade shows and conferences by tracking the outcomes of contacts made at these events.

Outcome 6. Current incentive approval procedures may include redundant steps that can cause incentive payment delays.

- Stakeholders identified redundancies and unclear approval responsibilities.
- SPECTRUM cannot notify Implementer staff when applications pass approval milestones.
- SPECTRUM prevents Energy Advisors from easily tracking customer applications.
- Trade allies characterized the approval process as "lengthy."
  - 72% of participants said their incentive checks took more than four weeks to arrive (14% took more than eight weeks).

Recommendation 6. Consider ways to streamline the incentive application approval processes and monitoring of projects and incentive payments. For example:

- Create a checklist detailing what items each reviewer should verify.
- Improve SPECTRUM reporting to allow Energy Advisors to more easily track their projects through completion and payment.
- Consider automated notification capability in SPECTRUM for approvals and payments.
- Establish performance standards for approval times and create a regular report for "Time-in-Process" to monitor the length of time a project is in an approval queue.

Outcome 7. The custom incentive path is challenging for Trade Allies to understand and navigate.

- Trade Allies identified the custom program as difficult and time-consuming.
- They suggested streamlining the custom process, making it easier to understand, and providing more information about how to apply for custom incentives.

Recommendation 7. Consider studying the custom incentive process in-depth to determine what specific elements of the process create difficulties for Trade Allies, and address any problems identified.

Outcome 8. The goal-setting process, which occurs as part of contract negotiations, needs to establish reasonably achievable goals appropriate for the mix of fuels and products in targeted customer facilities.

- Stakeholders said the initial savings forecasts were "unrealistic" based on previous Commercial Program results.
- Goals had to be adjusted downward during the first eight months the Program.
- Stakeholders said the Program's targeted customers use little natural gas.
- Relationships with regional and national decision-makers are slow to develop.

Recommendation 8. Consider how to develop Program goals to better align to market savings potential and sales-cycle time. For example:

- Conduct end-use surveys and fuel-use and energy assessments for a sample of representative facilities and compare the data collected to assumptions.
- Assess the impact of longer decision-making cycles for regional and national chain facilities.
- Update assumptions and projections for different segments according to market findings.

Large Energy Users Program

Through the Large Energy Users Program, launched in April 1, 2012, Focus on Energy offers prescriptive and custom incentives to large industrial, commercial, and institutional customers for installing energy-efficiency measures. Unlike previous Focus on Energy commercial and industrial programs that targeted business sectors, the Large Energy Users Program targets customers with high energy usage. Program Implementer staff, including Energy Advisors, along with Utility Key Account Managers and Trade Allies work together to deliver the Large Energy Users Program.

The Evaluation Team conducted both an impact evaluation and process evaluation of the Large Energy Users. The ex post verified gross savings for CY 2012 are 76,282,222 kWh and 4,552,913 therms. Carryover projects from Legacy Programs contributed 55% of the kWh savings and 87% of the therms saved.

M&V Approach

These were the key questions that directed the Evaluation Team's design of the M&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? What are other barriers specific to this Program and Segment?
- How is the Program leveraging the current supply chain for Program measures and what changes can increase the supply chain's support of the Program?
- What is customer satisfaction with the Program?

The Evaluation Team investigated gross and net energy and demand impacts, program operations, successes, and areas for improvement during the first nine months of the Large Energy Users Program operation. The Evaluation Team used the data collection activities and sample sizes listed in Table 132.

The Evaluation Team used a combination of activities to complete the evaluation of the Large Energy User Program. The impact evaluation activities consisted of either a project audit (desk review of records) or on-site measurement and verification. In some cases, the Team surveyed participants to collect additional information needed from either the project audit or on-site measurement and verification. For the process evaluation, the Team conducted database and Program materials reviews as well as stakeholder and participant Trade Ally interviews. The Team also conducted participant

customer interviews. Nonparticipant and partial-participant process surveys will be conducted in CY 2013 when a more robust sample population should be available.[67]

Table 132. Large Energy Users Data Collection Activities And Sample Sizes

Activity	Evaluation Area	Sample Size (n)	Relative Precision at 90% Confidence
Project Audits and Verification Surveys[1]	Impact	49	±11%[2]
On-Site Measurement And Verification	Impact	26	±11%
Stakeholder Interviews[3]	Process	17	Qualitative
Materials Review	Process	N/A	Qualitative
Participant Customer Interviews[4]	Impact and Process	22	Qualitative
Participant Trade Ally Interviews[5]	Process	15	Qualitative

1 The total number of completed project audits represents the total number of records sampled. To ensure proper weighting by realization rate savings, the Team merged multiple measures of the same category for a given application, thereby reducing the effective number of sample points.

2 The Team calculated the relative precision levels at the aggregate level, combining the project audit/impact participant survey sample with the on-site measurement and verification sample. The precision reported represents the relative precision of MMBtu for all three programs combined.

3 Stakeholder interviews included the Program Administrator, two Program Implementers, six Energy Advisors, and eight Utility Key Account Managers.

4 The Team defined Participants as customers who had projects completed in CY 2012 after Program launch.

5 The Team defined Participant Trade Allies as those who submitted projects to the Large Energy Users Program after April 1, 2012.

The Evaluation Team selected a stratified random sample of projects for project audits and participant surveys. 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 Trade Allies (if applicable);
- Energy audits and feasibility studies;
- Customer metered data;
- Invoices for equipment or contracting services;
- Any other documentation submitted to Focus on Energy

After project audits, the Evaluation Team conducted participant surveys using e-mails and phone calls to follow up with the audited customers and collect information that was not available through SPECTRUM documentation.

[67] The Evaluation Team identified twelve unique partial participants who had not completed a project during CY 2012, in the Program database; only three had contact information associated with them. Nonparticipant contact information was not available in time for the CY 2012 evaluation.

The Evaluation Team identified high-priority measure groups based on their contribution to the savings. These were initially identified using the cost-effectiveness calculator and then verified by analyzing the CY 2012 program database.[68] The Team determined the high-priority measure groups for the Business Incentive, Large Energy User, and Chain Store and Franchises programs jointly, that is, the high-priority measure groups are the same for each program. The Evaluation Team made this determination recognizing that Focus on Energy standardized its eligibility requirements, measure specifications, and incentives across the three programs.[69]

In addition to facilitating the verification of energy impacts, on-site visits enabled the Team to gather data for evaluating critical Program delivery components, such as savings input assumptions and any discrepancies between verified savings and reported savings.

Table 133 lists a summary of activities the Team completed for the CY 2012 Program by measure group.

Table 133. Large Energy Users Program Impact Activities By Measure Group

Measure Group	Project Audit	On-site measurement and verification	Total Analyses
Boilers and Burners	3	0	3
Compressed Air	4	2	6
HVAC	2	4	6
Lighting	11	28	39
Other[1]	0	1	1
Process	6	14	20
GRAND TOTAL	**26**	**49**	**75**

[1] 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. Additionally, for the Large Energy users Program due to data errors the Other category contained negative adjustment measures. The Evaluation Team condensed these measure groups into one category for the purpose of evaluation because their relative contribution to the overall program was small.

Table 134 lists the high-priority measure groups for CY 2012 and their savings contribution to the Large Energy Users Program.

[68] This definition of "high-priority measure" was established during the development of the 2012 PSEPs and is different from the definition set forth in the 2011 evaluation.

[69] This methodology resulted in high-priority measure groups that would not have been high priority for an individual program. Similarly, the high-priority measure groups for an individual program were not always identified as high priority with the three programs combined. The Evaluation Team will revisit high-priority measure groups for the CY 2013 and CY 2014 evaluations based on historical information.

Table 134. Nonresidential Measure Groups And Large Energy Users Program Gross Savings Contribution

Measure Group	% of KW Savings	% of kWh Savings	% of Therms Savings
Boilers & Burners	0%	0%	33%
Building Shell	0%	0%	3%
Compressed Air, Vacuum Pumps	17%	20%	8%
Domestic Hot Water	0%	0%	0%
Food Service	1%	1%	3%
HVAC	4%	2%	53%
Lighting	29%	30%	0%
Process	31%	40%	0%
Renewable Energy	24%	18%	0%
Training & Special	0%	0%	0%
Vending & Plug Loads	0%	0%	0%
GRAND TOTAL	**100%**	**100%**	**100%**

[1]Additional measures were not provided in this table. With additional measures, including negative adjustment measures, the totals all equal 100%. As noted above, all additional measures were combined into the "Other" category.

To assess Program operations and performance, the Team reviewed Program materials and documentation, interviewed participating stakeholders and Trade Allies between November 2012 and February 2013, and analyzed tracking data.

Impact Evaluation

The impact evaluation focused on determining the verified gross and net electric and gas savings attributable to the Program. Evaluation activities that informed the impact findings included a database review, project audits, on-site measurement and verification data, engineering analyses, and customer surveys to develop net-to-gross ratios. Table 135 lists the measure-level realization rates for CY 2012.

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. Some carryover projects approved in the prior Legacy Programs and completed after the new programs launched in April 2012 were included in the sample design.[70] The Team calculated realization rates at the measure level using savings-weighted

[70] The SPECTRUM data extract identified carryover projects as assigned to the new programs. The Team later recognized that the projects were approved and initiated under previous program designs, and learned they could be identified through use of a different data field. Carryover project findings were not applied to projects initiated in the new programs. These projects were labeled with "SECTOR" in the application name.

averages across the three major Nonresidential programs, resulting in identical measure-level realization.[71]

The Evaluation Team multiplied the measure-level program gross savings by the corresponding measure-level realization rate to arrive at the total program verified gross savings. Since these realization rates were calculated using only current program projects, the Evaluation Team only applied the realization rates to the corresponding current program projects.

Table 135. Nonresidential Large Energy User Program Realization Rates For Current Measures

Measure Group	Realization Rate		
	kWh	KW	Therms
Boilers & Burners [1]	144%	1597%	96%
Building Shell	-	-	100%
Compressed Air, Vacuum Pumps	95%	119%	100%
Domestic Hot Water	94%	80%	100%
Food Service	94%	80%	100%
HVAC	93%	83%	100%
Lighting	107%	101%	-
Other	94%	80%	-
Process	123%	108%	-
Renewable Energy	94%	80%	-
Training & Special		-	-
Vending & Plug Loads	94%	-	-

[1] Realization rates for the Boilers and Burners are very high but have very little influence on the actual program savings (less than 0.001%). While most Boilers and Burners measures only claimed therms savings, a very small percentage claimed KW and kWh savings as well. The evaluation sample contained one of these instances and skewed the realization-rate calculation.

The Evaluation Team applied realization rates developed in previous evaluation findings for the Legacy Programs to carryover projects. The measure-level realization rates for carryover projects are summarized in Table 136.

[71] Note that measure-level realization rates are not intended to reach 90/10 confidence and precision levels until the Evaluation Team completes three full years of evaluation and combines the results across the three major Nonresidential programs (Business Incentive, Large Energy User, and Chain Store and Franchise).

Table 136. Nonresidential Large Energy User Program Realization Rates For Carryover Measures

Measure Group	KW Realization Rate	kWh Realization Rate	Therms Realization Rate
Boilers & Burners	113%	22%	117%
Building Shell	96%	121%	-
Compressed Air, Vacuum Pumps	74%	48%	163%
Domestic Hot Water	93%	87%	-
Food Service	115%	79%	93%
HVAC	105%	103%	97%
Lighting	110%	138%	-

Table 137 lists separate weighted average realization rate for the Large Energy User Program's current measures and carryover measures. [72] While realization rates are identical across each of the three major programs, they are weighted differently for each individual program due to the differing relative contribution of savings by each measure group, resulting in differing program realization rates.

Table 137 shows the program-level realization rates in KW, kWh, therms, and MMBtu.[73]

Table 137. Large Energy User Program Realization Rates

	Realization Rate			
	KW	kWh	Therms	MMBtu Total
Current	106%	107%	99%	104%
Carryover	94%	102%	121%	115%
Total	100%	104%	117%	112%

Gross and Verified Gross Savings

Table 138 lists the gross and verified gross savings.

[72] This roll-up method influences the realization rate calculation. In this case, the Team applied standard measure-level realization rates to each program. If realization rates are rolled up at the program-level instead of at the measure-level, the final weighted average realization rate will differ. This will also reduce relative precision levels because the number of sample points per measure per program will decrease.

[73] MMBtu is calculated by converting kWh to MMBtu by multiplying kWh by 0.003412 and converting therms to MMBtu by multiplying therms by 0.1 and summing the result.

Table 138. Large Energy User Program Gross Savings Summary

	Gross			Verified Gross		
	kWh	KW	Therms	kWh	KW	Therms
Current Annual	32,376,278	4,909	658,937	34,615,255	5,195	650,524
Current Lifecycle	365,243,411	4,909	9,473,899	390,503,483	5,195	9,348,202
Carryover Annual	40,853,546	4,301	3,227,596	41,666,968	4,045	3,902,390
Carryover Lifecycle	458,892,867	4,301	42,475,323	462,748,466	4,045	52,806,271
Total Annual	**73,229,824**	**9,209**	**3,886,533**	**76,282,222**	**9,240**	**4,552,913**
Total Lifecycle	**824,136,278**	**9,209**	**51,949,222**	**853,251,948**	**9,240**	**62,154,473**

Net-to-Gross Analysis

The Large Energy User Program Plan states that the Evaluation Team planned to use the Standard Market Practice (SMP) method to calculate net savings. This evaluation design relied on the completion of the baseline study, which was not available for the CY 2012 Evaluation Report.

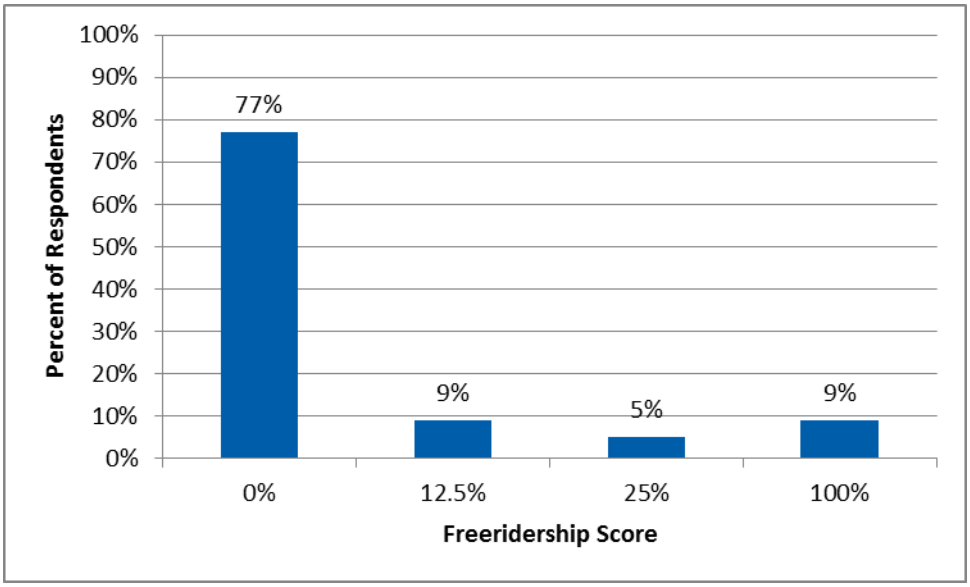
As an alternative to the SMP method, the Evaluation asked a series of freeridership questions and a series of spillover questions in the participant survey.[74] Further information on the freerider scoring methodology and calculation of spillover appears in Appendix P.

Freeridership Findings

Freeriders are program participants who would have purchased the same efficient measure at the same time without any influence from the Program. The Team derived the participants' freeridership score by translating their survey responses into a matrix value and then applying a consistent, rules-based calculation to obtain the final freeridership score. Figure 50 shows distributions of survey respondents by freeridership scores assigned to each participant response.

[74] See Appendix M, Large Energy User Participant Customer Survey-Questions G1–G14 and H1-H5.

Figure 50. Large Energy User Freeridership Distribution by Estimate



Overall the Program had a freeridership of 6% across all respondents after weighting survey responses for each measure by the Program population. The Evaluation Team evaluated gross energy savings distribution for the measure type and overall Program (Table 139). Similar measures are grouped by type where the sample size is sufficient.

Table 139. Large Energy Users Freeridership Estimates

Program Measure Type	n	Freeridership Estimate	Absolute Precision
Overall	22	6%	± 10%

Spillover Findings

Spillover is defined as the percentage of customers who were influenced to invest in additional efficiency measures for which they did not receive rebates. No survey respondents indicated that their participation in the Large Energy User Program was "very influential" in their decision to invest in additional efficiency measures. There was no spillover for the Program.

Net-to-Gross Ratio[75]

To estimate net-to-gross, the Evaluation Team combined the spillover and freeridership results using the following calculation:

$$NTG = 1 - Freeridership + Spillover$$

As shown in Table 140, the Team estimated a 94% net-to-gross ratio for the Program overall. The Team notes the CY 2012 net-to-gross estimates are noticeably higher than prior findings in Wisconsin; for

[75] See Appendix P for a complete Net-to-gross Analysis methodology.

example, the prior net-to-gross ratio for lighting measures was 60% and for HVAC it was 45%.[76] The estimates are on the high end of the range of net-to-gross findings observed in other nonresidential programs, however direct comparisons can be difficult. Focus on Energy has identified freeridership as a specific area for improvement in the past. However, the data available in CY 2012 was not sufficient to determine if actions taken may have contributed to this improvement. The Implementer did note they changed how staff performance is measured to reduce the likelihood a project recognized as a freerider in the screening process would be approved. During customer surveys, many Large Energy Users reported they would not have installed projects without the Program incentives.

Table 140. Large Energy User Freeridership, Spillover, And Net-To-Gross Estimates By Measure

Measure Name	Freeridership (%)	Spillover (%)	Net-to-Gross (%)
Overall	6%	0%	94%[1]

1 Weighted by evaluated gross energy savings.

Treatment of Carryover Program Data

The Team applied net-to-gross values developed in prior evaluation work to the gross savings for each of the measures in carryover projects that originated in Legacy Programs and were completed and paid incentives by the Business Incentive Program. Table 141 lists the net-to-gross estimates for each measure group.

Table 141. Large Energy Users Program Carryover Net-to-Gross Rates

Measure Name	Net-to-Gross (MMBTU)
Boilers and Burners	100%
Compressed Air	60%
HVAC	45%
Lighting	60%
Other	100%
Process	59%
Refrigeration	48%

Net Savings

Table 142 lists the net savings for the Large Energy Users Program. The savings provided below are net of what would have occurred without the Program.

[76] Stipulated Net-to-gross TG ratios used in CY 2011 were based upon the results of the 2010 evaluation work.

Table 142. Large Energy User Net Savings

		Verified Net		
		kWh	KW	Therms
Current	Annual	32,538,339	4,884	611,492
	Lifecycle	367,073,274	4,884	8,787,309
Carryover	Annual	28,805,666	2,621	2,508,427
	Lifecycle	313,539,177	2,621	34,169,860
Total	**Annual**	**61,344,005**	**7,505**	**3,119,920**
	Lifecycle	**680,612,451**	**7,505**	**42,957,169**

Process Evaluation

Key Research Questions

For CY 2012, the Evaluation Team's process evaluation focused on the effectiveness of the implementation and delivery of the Large Energy Users Program for the first nine months of its operation and to identify opportunities for improvement. The process evaluation addressed these key research questions:

- How can the program delivery processes cost-effectively increase its energy and demand savings?
- Does the Nonresidential Program adequately meet the needs of large customers?
- How effective are the Program's marketing, outreach, and communication efforts in reaching targeted large customers?
- How well is the Program establishing and leveraging the Trade Ally network to promote the installation of high-efficiency equipment?
- Are customers and Trade Allies satisfied with the Program?
- What are the barriers to increased customer participation, and how effectively are the Program Implementer and Administrator overcoming these barriers?
- How effective are the Program's operating procedures (data tracking, project monitoring, QA/QC) at measuring the Program's performance?

Program Design and Goals

Transition to New Program Design

According to interviews with stakeholders and Trade Allies, the new Program design transitions the focus from targeting business segments to targeting energy use. This change initially created uncertainty for Trade Allies and utility Key Account Managers as to the best program fit for certain customers. This confusion most often arose when a local utility had classified a customer as a large user but that customer did not meet the minimum energy-use requirements for the Program.

Energy Advisors largely shielded customers from this confusion. However, customers whose Energy Advisor had changed said they experienced confusion about what program was the most appropriate

and who to contact about participation. The Program Administrator, Program Implementer, Energy Advisors, utility Key Account Managers, Trade Allies and customers reported the confusion has declined in the past six months as everyone becomes more familiar with the new Program.

Program Management and Delivery

Based upon interviews with the Program Administrator, Program Implementer (including Energy Advisors), Trade Allies, utility Key Account Managers and customers, most saw improvement in Program management and delivery over the past six months, as everyone grew familiar with the Program changes. Some customers and Trade Allies, however, expressed concern at the diminishing availability of some of the Energy Advisors, saying they are “spread too thin" to adequately meet their needs. Customers said they rely heavily on the Energy Advisors to help them identify projects and complete applications, especially for custom projects, and that they wanted more frequent follow-up.

In addition, some utility Key Account Managers, while expressing a high level of confidence in the Energy Advisors, said they would like to be better informed about the status of their customers’ projects, including being invited to project meetings. Since it is the job of the utility Key Account Managers to advise these major customers, they expressed concern that the lack of communication results in their being sidelined.

Program Documentation Review

Overall, the materials that support the Large Energy Users Program operation are complete and are available on the Focus on Energy SharePoint site or online at the Program Website. These materials include the Large Energy Users Program Operations Manual 2012 to 2013, which is comprehensive and clearly documents all of the parties’ responsibilities, Program goals, and procedures. The Evaluation Team noticed a few minor issues with labeling and misdirected links in the Manual and communicated these issues to the Program Administrator for correction. (See Appendix L for a detailed materials review.)

Program Outreach and Marketing

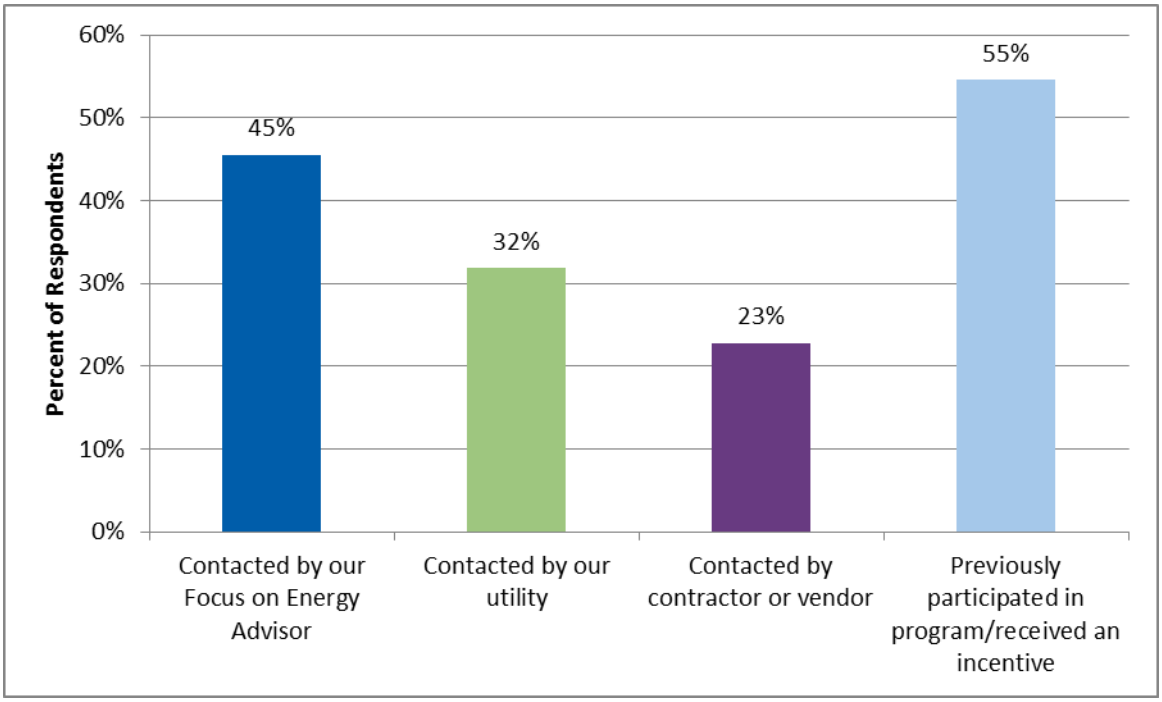
Customer Awareness

When asked about the level of awareness potential large energy users had of the Program, the Program Administrator, Energy Advisors, and utility Key Account Managers reported they believe the state’s large energy users are at least somewhat aware of the Program. Customers told us they rely on their Energy Advisors, Trade Allies, and utility Key Account Managers to stay abreast of the Program details and changes.

Figure 51 shows that just over one-half of participating customers learned of the current Program due to their participation in prior programs. They also learned about the Program through:

- Energy Advisors (45%);
- Utilities (32%);
- and Vendors (23%).

Figure 51. How Participants Learned About The Large Energy Users Program In 2012 (n=22)[1]



1 Percentages add up to more than 100% because the survey question allowed multiple responses.

Website and Collateral Materials

Views of the Focus on Energy Website are mixed, with 47% of surveyed customers saying they were very satisfied with it but another 31% saying they seldom used it. Interviews with Trade Allies, utility Key Account Managers, and customers, as well the Evaluation Team's review of the Website, revealed it was challenging to search for specific products, applications, Program updates, and any new product added to the approved prescriptive products list.

Customer Satisfaction with the Program

As shown in Figure 52, aside from the Website rating previously discussed, a large majority of customers surveyed said they were very satisfied with these elements of the Program:

- Contractor quality (95%);
- Relationship with their Energy Advisors (89%);
- Incentive amount (84%);
- Communication (84%);
- Overall Program experience (79%);
- Relationship with their Key Account Manager (74%).

Figure 52. Customer Satisfaction With Program Experience, Communication, And Incentives (n=19)

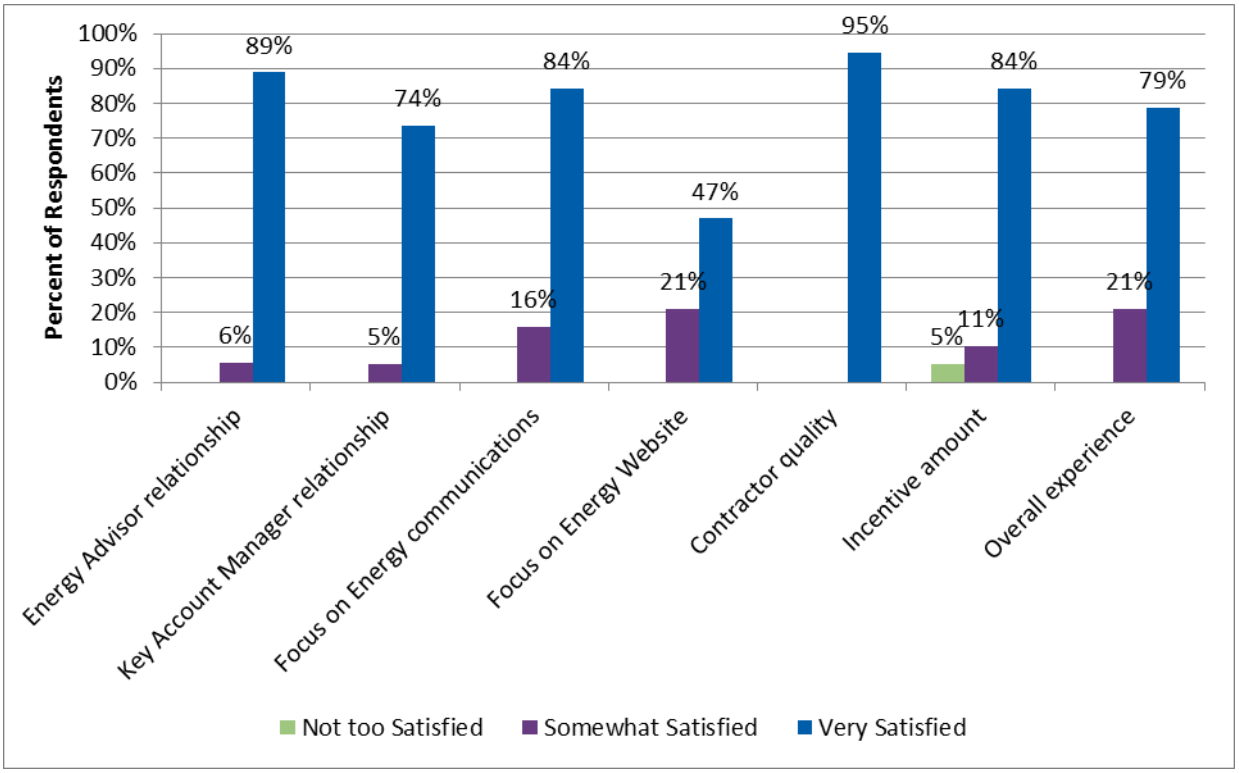
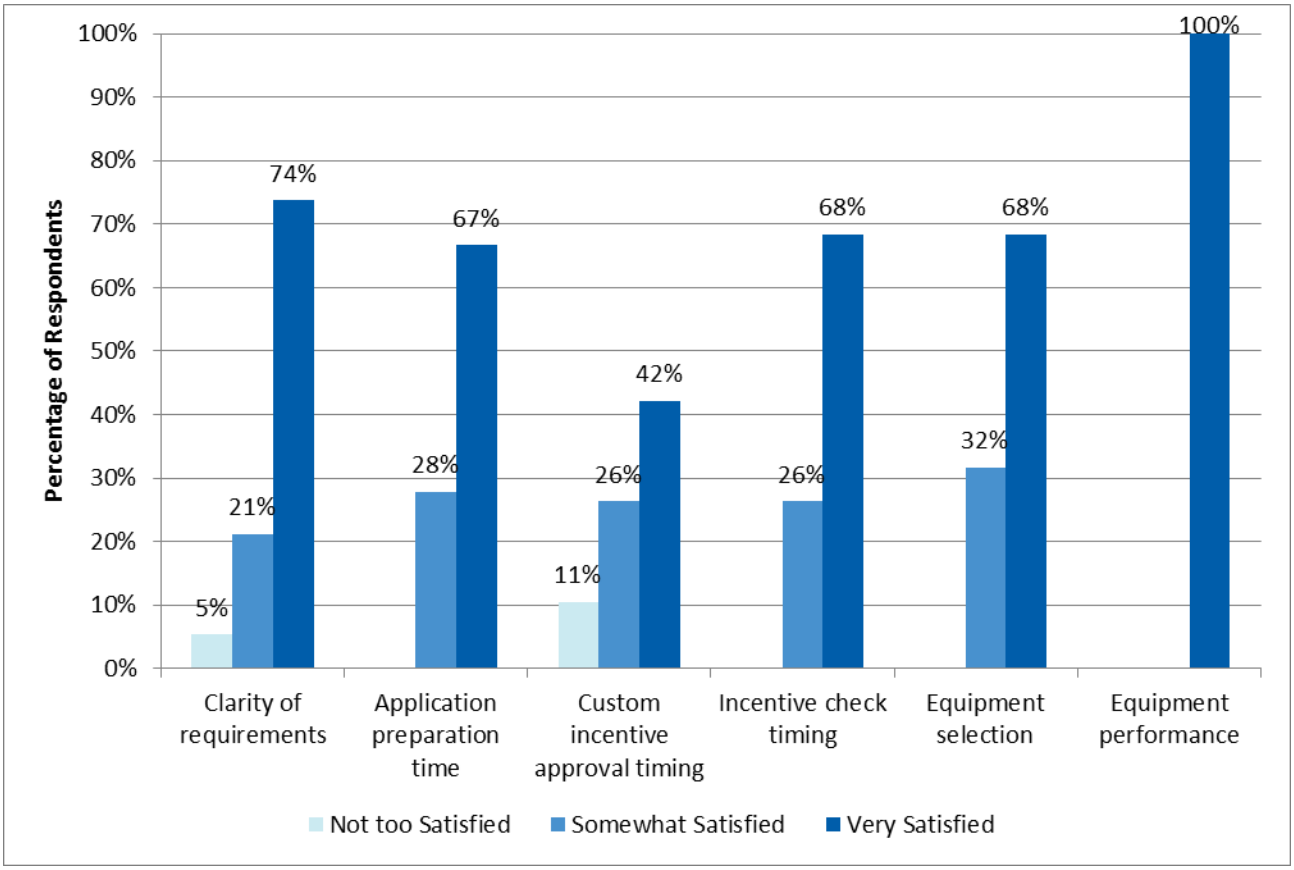


Figure 53 shows that 100% of customers surveyed were very satisfied with the performance of the equipment installed through the Program. Most customers were also very satisfied with the:

- Clarity of the Program requirements (74%);
- Equipment choices (68%);
- Timing of the incentive checks (68%);
- Time it took for the application preparation (67%).

Fewer customers, however, were satisfied with custom application preapproval timelines (42%). While they recognize that complex custom projects require time to evaluate, their company budget cycles and decision processes are time-sensitive. When probed on how long they thought approval should take, the customers who answered said these should take no longer than two to three weeks.

Figure 53. Customer Satisfaction With Program Equipment, Performance, And Timing (n=19)



To explore if customers were actually experiencing long approval timeframes, the Evaluation Team reviewed the SPECTRUM data for Program projects completed and paid in CY 2012. The Team looked at the time elapsed between the data fields Application Measure Created on Date and Preapproved Date. Of the 119 projects reviewed, the Evaluation Team found significant delays occurred in June and August. However, for the period August 30 through December 13 (the last Application Created Date in the data sample), approval timeframes dropped to less than one week.

Even though satisfaction varied somewhat across the Program elements, many customers said they appreciated the incentives, were confident in the Energy Advisors' expertise, and hoped for the continuation of Focus on Energy. To quote one customer:

- *"Keep providing the incentives. It makes the difference in going forward with projects."*

Customer Decision Making

Reasons to Participate and Benefits

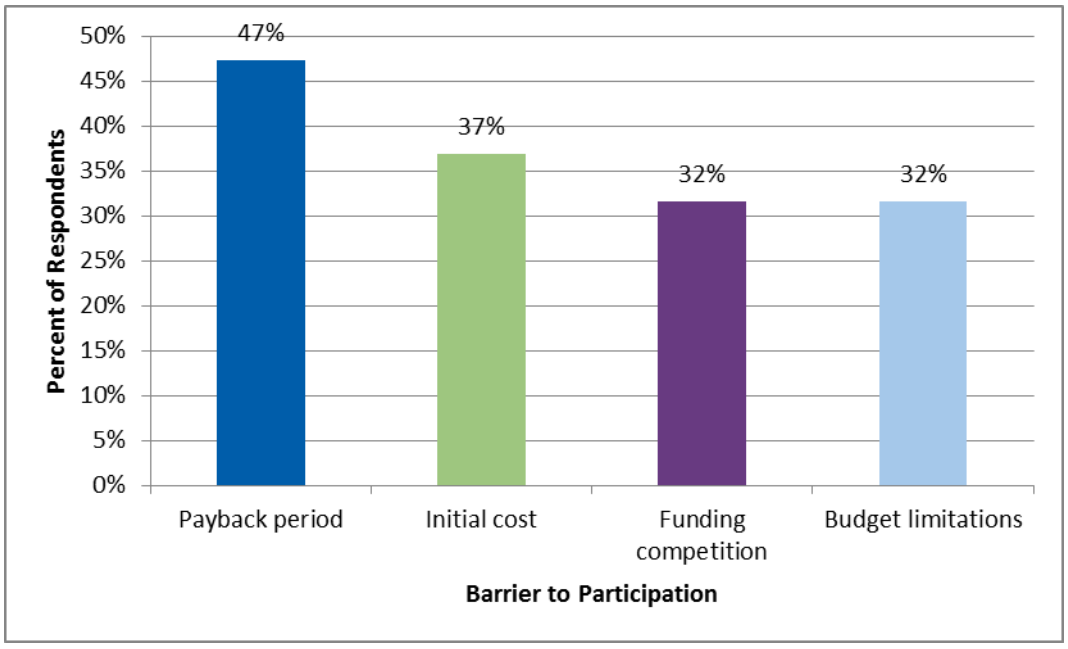
Large energy users report they participate in the Program to receive the incentives and to save energy. However, they also said the Program benefitted them in the following ways:

- Reduced greenhouse gasses, which In turn help them meet corporate sustainability goals;
- Good public relations;
- Improved processes and operations.

Barriers to Participation

Large energy users share many barriers to making energy-efficiency improvements in their facilities. Figure 54 shows at the top of the list are long payback periods and high initial cost. The customers surveyed told the Evaluation Team they use the incentives to address these top two barriers. Figure 54 also shows that projects compete for limited funding.

Figure 54. Customer Barriers To Participation (n=15)



The utility Key Account Managers the Team surveyed said, based on input from their large customers, they believe customers are not participating because they lack the funds or saving energy is not a company priority. Energy Advisors also reported that some customers may not participate due to past negative experiences with Focus on Energy. The Energy Advisors did not say when the negative experiences took place or if a specific plan was in place to address this issue.

Recommended Improvements

When asked what Focus on Energy could do to help overcome the reported barriers and what equipment should be added to the Program, customers requested the following:

- Funding for studies to analyze their systems for the purpose of identifying additional energy-efficiency opportunities;
- Incentives for newer refrigeration technologies, specifically absorption chilling;
- Additional variable-frequency drive (VFD) selections;
- More flexibility in project payback requirements;
- More flexibility in project timeline requirements.

Trade Ally Network

Trade Ally Enrollment

In an effort to refresh the database, the surveyed Energy Advisors said that all Trade Allies were required to re-register with Focus on Energy when the Program Administrator changed. Some Trade Allies said they were not sure if their companies were registered. In addition, all of the active nonregistered Trade Allies surveyed said they need additional information on the benefits of registration.

Trade Ally Satisfaction

Trade Ally satisfaction with the Program is mixed. Most find the Program beneficial to their business and their customers, and are very satisfied with the Website and the materials, training, and tools they receive. On the other hand, less than one-half are very satisfied with the assistance they receive in identifying new projects or with the project application approval process. They also said the custom incentive processes seem unnecessarily complex or slow. One Trade Ally was redirected by Administrator and Implementer Staff from the custom program to the prescriptive program because it was simpler to understand.

Of the 15 Trade Allies surveyed:

- Eleven are very satisfied with the materials, training, and tools they received from Focus on Energy (two were less than very satisfied, and two did not use these);
- Ten are very satisfied with the Website;
- Seven are very satisfied and six are somewhat satisfied with the Energy Advisors' understanding of their needs;
- Seven are very satisfied and six are somewhat satisfied with the support they receive from the Focus on Energy staff;
- Seven Trade Allies surveyed are very satisfied with the communication they receive from Focus on Energy, while seven are somewhat satisfied;

- Only five are very satisfied with the assistance they receive from Focus on Energy in identifying new projects (they would like more assistance in this area);
- And only five are very satisfied with the project approval process.

Trade Allies who were somewhat satisfied noted specific challenges, including:

- Inadequate information from the Program Implementer about project progress;
- Not knowing who to call at the Program Administrator;
- Delayed responses to their questions.

The Trade Allies requested these program improvements:

- More frequent and responsive communication from the Program;
- Annual or more frequent meetings to go over Program documents, particularly applications and updates on document changes.

Trade Ally Training and Information

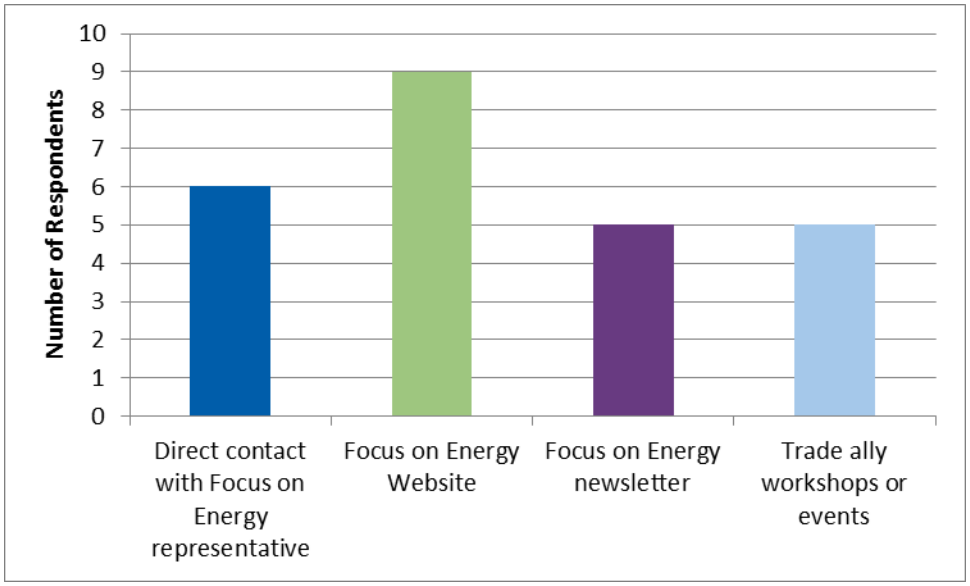
While most Trade Allies said they did not need help to deliver the Program, a minority said they would like more information on one or more of these topics:

- The equipment included in the Program;
- How to apply for rebates;
- The benefits of enrolling as a Trade Ally;
- Customer qualification requirements.

When asked about technical support, Trade Allies said they lacked technical information on new lighting products, and that the trainers providing technical workshops sometimes lacked the required knowledge.

When asked how they stay informed about the Program, Trade Allies most often said they relied on the Focus on Energy Website and direct contact with a Focus on Energy Representative (Figure 55).

Figure 55. How Do Trade Allies Stay Informed About The Focus On Energy Program (n=14)

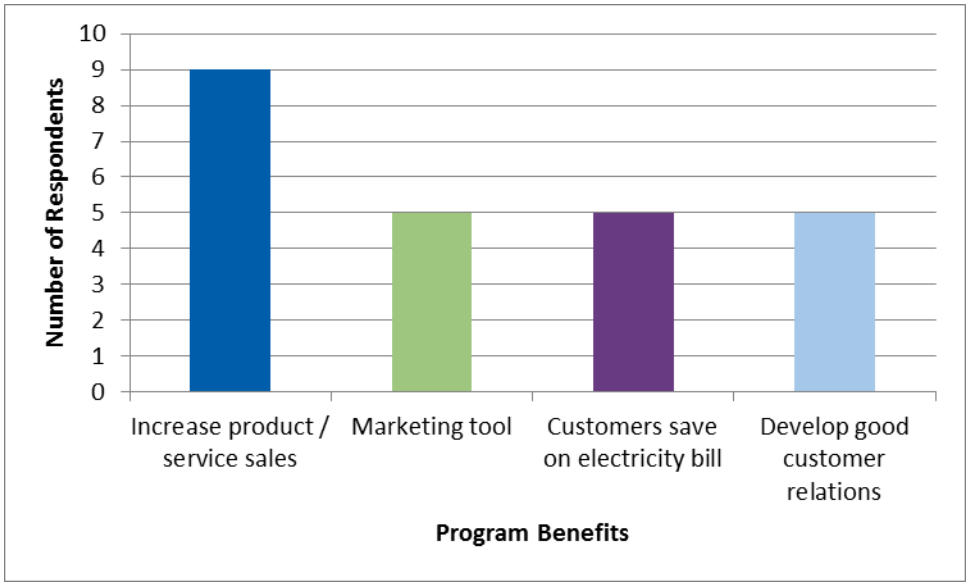


When the Team asked the Trade Allies how they want to be updated about the Program, they preferred direct contact from Focus on Energy, regular e-mails, Website updates, and workshops or events. Many asked for more timely communication, saying their customers sometimes know about Program changes before they do. They also asked for the Website to be kept current.

Trade Ally Motivation and Perceived Benefits

The Team also surveyed the Trade allies about their motivations to participate in the Program and the primary benefits they receive as a result.

Figure 56. Trade Ally Reported Program Benefits (n=15)



Trade allies most often cited increased sales as a benefit. Other benefits included using the Program as a marketing tool, helping customers save on their bills, and stronger customer relations, as shown in Figure 56. One-third said the availability of incentives from Focus on Energy has changed the way they do business, including:

- Having invoices that show a Focus on Energy-qualified product;
- Changing their products to include those in the Program.

None of the Trade Allies the Team surveyed said that the bonuses offered in CY 2012 to encourage new and returning participation and to reward error-free application submittals were a motivating factor. In fact, they said applying for the bonus incentive has become very cumbersome and unnecessarily complicated.

Data Management

All parties involved with the SPECTRUM database described problems with its functionality and accuracy. To compensate, Energy Advisors and utility Key Account Managers developed individualized spreadsheets or used the particular utility's customer relationship management (CRM) programs to track their customers' projects. Areas of specific concern by group are:

All Users

- Project pipeline tracking.

Program Implementer

- Difficulty changing information in projects already in the SPECTRUM database, especially those in the approval pipeline prior to program rollout in CY 2012.

Key Account Managers

- Energy-savings reports that indicate greater savings for a project than the customer's actual usage;
- Summary reports without individual project breakouts;
- Inconsistent timing of report delivery.

All users report they saw improvement with the SPECTRUM database in recent months and the SPECTRUM applications and dashboards currently under development should address most respondents' issues.

Program QA and Verification

The Large Energy Users Program Operations Manual describes detailed quality assurance (QA) and project verification procedures. These procedures include individual measurement eligibility requirements, a project inspection protocol, and risk mitigation efforts. The manual also directs readers to the Quality Assurance and Measurement Verification Plan, a detailed QA and verification plan developed by the Program Implementer that addresses each of these areas in greater detail. The

Evaluation Team found that Program QA procedures appear aligned with best practices.[77] During the review of the procedures, the Team identified a few areas in risk mitigation and the project inspection protocol where confirmation of the QA process would be beneficial.

- Risk mitigation is carried out, in part, through the use of detailed incentive processing procedure manuals. In the course of requesting all Program materials for review, the Evaluation Team did not receive incentive processing procedure manuals to review nor was the team able to locate these on the Focus on Energy SharePoint Website. It is unclear if these are in place.
- Additionally, according to the manual, the SPECTRUM system performs many of the QA/QC checks during incentive processing. In conversations with the Program Administration and Program Implementer, they described multiple general problems with SPECTRUM's functionality.
- Neither document addresses inspection of projects with incentives <$40,000 under project inspection protocol.

Program Cost Effectiveness

The benefit cost (B/C) test, also known as a cost-effectiveness test, is used to compare the benefits of a demand side management program with the costs of the program. There are several tests used for evaluating energy efficiency cost-effectiveness. The benefit cost test used in Wisconsin is a modified version of the total resource cost (TRC) test. This test is a commonly administered test for evaluating energy efficiency programs. A description of the test can be found in Appendix H.

The CY 2012 Large Energy Users Program, and Program carryover, was found by the Evaluation Team to be cost effective (a TRC ratio above 1). Table 143 below provides the Large Energy Users Program costs and benefits:

Table 143. Large Energy Users Program Costs And Benefits

	Large Energy Users Program
Incentive Costs	$5,352,259
Administration Costs	$515,758
Delivery Costs	$2,106,056.20
Incremental Measure Costs	$12,894,503
Total Non-Incentive Costs	$15,516,318
Electric Benefits	$39,002,404
Gas Benefits	$37,391,547
Emissions Benefits	$21,788,643.82
Total TRC Benefits	$98,182,595
TRC Net Benefits	$82,666,277
TRC Ratio	6.33

[77] Best Practices Benchmarking for Energy Efficiency Programs Website: http://www.eebestpractices.com/.

Evaluation Outcomes and Recommendations

Impact Evaluation

The impact findings for the Large Energy Users Program and other nonresidential programs are summarized below in the Nonresidential Segment Measure-Related Recommendations section (Page 263).

Process Evaluation

Overall, the Large Energy Users Program has been successful and satisfying in most respects for its customers as well as Administrator and Implementer Staff, Trade Allies, and the utility Key Account Managers. It has been effective in establishing relationships with the customers, a key underpinning of the Program. Despite design changes, the Program met or exceeded most of its annual goals within nine months. Still, the process evaluation findings suggest opportunities for improvements.

Outcome 1. The Program will benefit from better working relationships between Energy Advisors and Key Account Managers. More integration of the utility Key Account Managers into the Program will benefit all parties. Such integration will keep utility Key Account Managers up to date on projects with important customers, leverage their good relationships with those customers for the Program's benefit, and bolster the reach of Energy Advisors. The Team understands from the Program Administrator that quarterly meetings between themselves and the utility Key Account Managers occurred in 2012. The Program Implementer attended the last meeting (held 2012-Q4), where participants discussed better information exchange between parties.

Recommendation 1. Continue meeting(s) between Energy Advisors and Utility Key Account Managers to identify how to improve communications and working relationships related to the Program. Desired outcomes of these meetings would be a better definition of roles and responsibilities for the utility Key Account Managers concerning the Program and a communication plan that informs them of efficiency opportunities, program changes, and progress on projects.

Outcome 2. Deeper savings will take further Program support. Feedback from customers, Energy Advisors, and Trade Allies suggests the Program will need to provide additional technical assistance and possibly higher incentives to identify, quantify, and install more complex solutions to increase energy and demand savings.

Recommendation 2. Provide additional funding for specialized technical resources, such as the Energy Advisors and/or third-party consultants that customers independently hire. Re-examine incentive levels for advanced high-efficiency systems to make sure they can support increased savings efforts.

Outcome 3. Custom project preapprovals exceeding the two to three weeks that customers or Trade Allies expect, result in customer and Trade Ally dissatisfaction. A shorter preapproval process is a better match for sensitive decision-making processes and project schedules. It also will help ensure fewer projects are derailed and will likely improve customer and Trade Ally satisfaction.

Recommendation 3. Set achievable time frames for approvals and communicate expectations to the customer during the initial project phases. Assign responsibility for monitoring and reporting approval time frames for active projects so those responsible can quickly identify and address problems. Assign responsibility for troubleshooting project approvals that go beyond a predetermined threshold of delay.

Outcome 4. Trade Allies need better Program support to effectively deliver high caliber services. High-quality training, tools, and excellent customer service are more effective in helping Trade Allies increase sales than small bonuses. Trade Allies are struggling with the custom program process and the quality of support they receive.

Recommendation 4. Increase customer service support and shorten response time to Trade Allies. Provide quarterly face-to-face program updates and training opportunities. Provide timely technical information about new products and ensure that Program trainers are experts in their fields and up to date on the latest products. Provide diagnostic tools and workbooks to facilitate consistent project development and certainty about project qualification.

Outcome 5. The Website is a weak link in Program communication. Customers and Trade Allies consistently said that navigating the Website to find specific program data is difficult.

Recommendation 5. CY 2013 Website revisions need to focus on simplifying navigation. Other improvements will identify and separate updates and materials by Program; add a menu at the top of the Applications page to direct users to forms for the custom or prescriptive incentives; and prepopulate customer information. If possible, test the revamped Website for usability.

Outcome 6. Some Program QA procedures need better definition.

Recommendation 6.

- Implement quality control checks to ensure all steps are occurring as intended with SPECTRUM.
- Clarify and document in the Program Operations Manual or QA&MV Plan the inspection requirements for projects with incentives <$40,000.
- Document incentive processing procedures or, if they exist for the larger Nonresidential Segment in general, identify and document those that apply to the Large Energy Users Program.

Small Business Program

The Small Business Program launched July 2, 2012, to encourage small businesses under 100kW 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 for small business customers. Trade Allies conduct 30 to 45 minute energy assessments at customer facilities to identify energy-efficiency opportunities. Following the energy assessment, customers may request Trade Allies install a free package of energy-efficiency equipment, or purchase, an additional "Gold Energy Savings" package for $129 or individual measures at discounted prices.

As a new Program in the Focus on Energy portfolio, the Small Business Program differs from the previous Commercial Program by specifically targeting small businesses in Wisconsin. The Program Implementer, Staples & Associates Inc., and qualified Trade Allies who have completed program-specific training, deliver the Small Business Program.

The Small Business Program's ex post verified gross savings for CY 2012 are 17,078,556 kWh and 31,292 therms.

M&V Approach

These were the key questions that directed the Evaluation Team's design of the M&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? What are other barriers specific to this Program and Segment?
- How is the Program leveraging the current supply chain for Program measures and what changes can increase the supply chain's support of the Program?
- What is customer satisfaction with the Program?

The Evaluation Team investigated gross and net energy savings, demand reduction impacts, Program operations, successes, and areas for improvement during the first six months of the Small Business Program operation. Table 144 lists the data collection activities and sample sizes are summarized.

Table 144. Small Business Program Data Collection Activities And Sample Sizes

Activity	Evaluation Area	Sample Size (n)	Relative Precision at 90% Confidence
Document Review	Process	N/A	N/A
Stakeholder Interviews[1]	Process	8	Qualitative
Participant Trade Ally Interviews[2]	Process	15	Qualitative

[1.] The Team conducted stakeholder interviews with the Program Administrator, Program Implementer, and five Energy Advisors.

[2.] The Team conducted Trade Ally interviews with contractors who responded to an initial e-mail or Team members called at random from a list of Small Business Program Trade Allies provided by the Program Implementer.

For the impact evaluation, the Evaluation Team reviewed the SPECTRUM database and reviewed deemed savings values. Due to the relatively late start of the Small Business Program, there were not enough projects in the population to draw a statistically significant and unbiased sample at the time that evaluation activities were scheduled to be begin. Any project audits and verification planned for 2012 will be conducted during the 2013 evaluation cycle, in addition to the 2013 activities.

For 2012, the Evaluation Team verified that planning assumptions were appropriately applied and carried forward net-to-gross ratios from the cost-effectiveness calculators provided by the Program Administrator. Deemed savings numbers were only adjusted where SPECTRUM showed inconsistent application of savings between projects for a single measure.

To assess Program operations and performance, the Evaluation Team reviewed its materials and documentation, interviewed stakeholders and Trade Allies who are participating in the Program, and analyzed tracking data.

Impact Evaluation

The Evaluation Team identified two general patterns of measures after reviewing the SPECTRUM database related to how savings were claimed.

First, for the majority of non-lighting measures and a few lighting measures, the SPECTRUM database consistently applied a deemed savings value per unit. For these measures, the Evaluation Team applied a 100% realization rate to the per unit savings.

There were several exceptions where it appeared that a deemed savings value was incorrectly applied. After review with the Program Administrator, the Team identified that most of these errors were generally caused by the Program Implementer swapping the KW and kWh savings fields when entering the data. The Program Administrator later added adjustment records to the database to account for these errors. For purposes of the evaluation, the Team adjusted these measures using the appropriate per unit savings values and eliminated the adjustment records to avoid double counting the adjustment. This applies primarily to the following measures:

- CFL, Direct Install, 13 Watt;
- CFL, Direct Install, 9 Watt;
- Delamping, T12 to T8, 4 foot lamp.

Second, for most lighting measures, excluding only occupancy sensors and LED exit signs, the Evaluation Team observed that measures did not have a consistent per unit deemed savings value. In general, per unit KW savings were more consistent than kWh values. The team learned that the Program Implementer uses a hybrid approach to calculate and enter savings using hours of operation values for each site. These hours of operations values were not accessible through the SPECTRUM database. For these measures, the Evaluation Team applied deemed savings found in the cost-effectiveness calculators provided by the Program Administrator. The savings were comparable in most cases, but resulted in a larger variance for the following measures:

- CFL Fixture, Direct Install With Co-Pay, 18 Watt, Exterior;
- CFL Fixture, Direct Install, 18 Watt, Exterior;
- LED, Replacing Neon Sign.

Table 145 lists the realization rates for each measure.

Table 145. Small Business Program Measure-Level Realization Rate

Measure Group	kWh Realization Rate	KW Realization Rate	Therms Realization Rate
Faucet Aerator, Direct Install, .5 gpm, Public Restroom, Electric	100%	100%	-
Faucet Aerator, Direct Install, .5 gpm, Public Restroom, NG	-	-	100%
Faucet Aerator, Direct Install, 1.5 gpm, Bathroom, Electric	93%	-	-
Faucet Aerator, Direct Install, 1.5 gpm, Bathroom, NG	-	-	97%
Insulation, Direct Install, Pipe, Per Foot, 1" Thickness, Electric	100%	-	-
Insulation, Direct Install, Pipe, Per Foot, 1" Thickness, NG	-	-	100%
Insulation, Direct Install, Pipe, Per Foot, 2" Thickness, Electric	100%	-	-
Insulation, Direct Install, Pipe, Per Foot, 2" Thickness, NG	-	-	100%
Showerhead, Direct Install, 1.75 gpm, Electric	100%	-	-
Showerhead, Direct Install, 1.75 gpm, NG	-	-	100%
CFL Fixture, Direct Install With Co-Pay, 18 Watt, Exterior	58%	108%	-
CFL Fixture, Direct Install With Co-Pay, 36 Watt, Interior	100%	100%	-
CFL Fixture, Direct Install, 18 Watt, Exterior	79%	110%	-
CFL Fixture, Direct Install, 36 Watt, Interior	100%	100%	-
CFL, Direct Install, 13 Watt	106%	6%	-
CFL, Direct Install, 14 Watt	100%	100%	-
CFL, Direct Install, 15 Watt	100%	100%	-
CFL, Direct Install, 16 Watt	100%	100%	-
CFL, Direct Install, 18 Watt	103%	80%	-
CFL, Direct Install, 23 Watt	92%	82%	-
CFL, Direct Install, 42 Watt	138%	103%	-
CFL, Direct Install, 5 Watt	100%	100%	-
CFL, Direct Install, 9 Watt	73%	69%	-
Delamping, T12 to T8, 4 foot lamp	111%	14%	-
Delamping, T12 to T8, 8 foot lamp	114%	110%	-

Measure Group	kWh Realization Rate	KW Realization Rate	Therms Realization Rate
LED, Exit Sign, Retrofit	100%	100%	-
LED, Replacing Neon Sign	108%	64%	-
Occupancy Sensor, Wall Mount, <=200 Watts	100%	-	-
Occupancy Sensor, Wall Mount, >200 Watts	100%	-	-
Occupancy Sensor, With Co-Pay, Wall Mount, <= 200 Watts	100%	-	-
Occupancy Sensor, With Co-Pay, Wall Mount, >200 Watts	100%	-	-
T8 1L 4', 28W, CEE, BF > 0.78	87%	100%	-
T8 1L 4', With Co-Pay, 28W, CEE, BF > 0.78	87%	106%	-
T8 2L 4', 28W, CEE, BF > 0.78	89%	73%	-
T8 2L 4', With Co-Pay, 28W, CEE, BF > 0.78	72%	77%	-
T8 3L 4', 28W, CEE, BF > 0.78	130%	101%	-
T8 3L 4', With Co-Pay, 28W, CEE, BF > 0.78	131%	93%	-
T8 4L 4', 28W, CEE, BF > 0.78	92%	77%	-
T8 4L 4', With Co-Pay, 28W, CEE, BF > 0.78	121%	85%	-
T8 4L or T5HO 2L Replacing 250-399 W HID	135%	100%	-
T8 6L or T5HO 4L Replacing 400-999 W HID	121%	99%	-
T8 or T5HO, Replacing >=1000 Watt HID	98%	86%	-
Adjustment Measure	-	-	-
Bonus, High Bay Lighting Replacement	-	-	-
Bonus, Trade Ally	-	-	-
Free Energy Savings Package	-	-	-
Gold Energy Savings Package	-	-	-
Timer, Engine Block Heater	103%	-	-
Vending Machine Controls, Occupancy Based, Cold Beverage Machine	100%	-	-

To calculate the total program gross verified savings, the Evaluation Team multiplied the measure-level realization rate to the claimed savings for each measure and summed all the products. The Team calculated the weighted average program realization rate by dividing the gross verified savings by the gross reported savings.

The program level realization rates are listed in Table 146.

Table 146. Small Business Program-Level Realization Rates

	Realization Rate			
	KW	kWh	Therms	MMBtu
Small Business Program	89%	101%	99%	101%

Gross and Verified Gross Savings

The gross and verified gross savings are listed in Table 147.

Table 147. Small Business Program Gross Savings Summary

	Gross			Verified Gross		
	kWh	KW	Therms	kWh	KW	Therms
Total Annual	16,860,104	3,687	31,657	17,078,556	3,281	31,292
Total Lifecycle	172,797,422	3,687	313,909	174,952,677	3,281	311,015

Net-to-Gross Analysis

The Small Business Program Plan states that the Evaluation Team planned to use the Standard Market Practice (SMP) method to calculate net savings. This evaluation design relied on the completion of the baseline study, which was not available for the CY 2012 Evaluation Report.

As an alternative to the SMP method, the Evaluation Team used the net-to-gross ratios from the planning assumptions for each measure. Measure assumptions were weighted by the verified program savings for the measure to develop the overall program net-to-gross ratio of 0.79.

Table 148. Small Business Program Freeridership, Spillover, And Net-to-Gross Estimates By Measure

Measure Name	Freeridership (%)	Spillover (%)	Net-to-Gross (%)
Overall	N/A	N/A	79%[1]

[1] Weighted by verified gross energy savings

Net Savings

Net savings impacts (kWh, KW, and therms) for the Small Business Program are listed in Table 149. The savings provided below are net of what would have occurred without the Program.

Table 149. Small Business Program Net Savings

		Verified Net		
		kWh	KW	Therms
Current	Annual	13,642,762	2,628	21,904
	Lifecycle	139,917,058	2,628	217,711

Process Evaluation

The CY 2012 process evaluation assessed the efficiency and effectiveness of the Small Business Program. The process evaluation addressed these key researchable questions:

- How well does the Program work, from the perspectives of the Program Administrator, Implementer, Trade Allies, and customers?
- How effective are the Program's marketing, outreach, and communication efforts?
- Are the customers and Trade Allies satisfied with Program features, including energy assessments, measure package options, and the enrollment process?
- How can the Program increase awareness and installation of low-cost, energy-efficient upgrades in Wisconsin's small business community?

- How well does the Program drive small business awareness and adoption of additional energy-saving measures offered in the Business Incentive Program?
- How effectively have the Administrator and Implementer addressed potential barriers to success and what additional barriers still exist?

Program Design and Goals

The Program Implementer reported a slow ramp-up period in the first month of the Small Business Program. However, in less than six months of operation, the Program reported completing 3,053 assessments and 1,245 total processed projects and nearly met its annual goals. The reported monthly volumes have continued to grow, demonstrating a high demand for the Small Business Program energy assessments and measure packages. Notably, the verified per-job energy savings exceeded the expected per-job for the Program goals, indicating strong Program energy savings performance over a shorter than planned time period. . When interviewed in December, the Program Administrator, Program Implementer, and Energy Advisors all expected savings to exceed the annual Program goals despite only operating for six months. However, the Program activity in December was lower than expected. The Small Business Program Implementer thought the slowdown may have been due to Trade Allies feeling less pressure since the Program had been extended until April 2013,[78] although factors, such as the press of the holiday season, may also have affected Program efforts.

Expectations for 2013 remain on an upward trajectory. The Small Business Program Implementer reported establishing additional savings goals (and corresponding budget) in order to meet the anticipated high demand during the interim period between December 31, 2012, and March 31, 2013 (the end of the fiscal year). Both the Program Implementer and Program Administrator reported ongoing planning to address the large volume expected during the first quarter of 2013 and ensure the Program continues throughout the entire year.

Program Management and Delivery

Based upon the Evaluation Team's interviews with the Program's stakeholders (Program Administrator and Implementer) and review of materials, the Small Business Program's management structure appears straightforward and clearly documented. The Program Implementer is responsible for overseeing the Program delivery, and oversees a group of Energy Advisors who are responsible for recruiting, training, and providing general support to Trade Allies.

According to the Program Implementer, Trade Allies conduct the majority of customer outreach, recruitment, and installation of Program measures. Wisconsin electrical contractors, who must complete training for the Small Business Program, make up most of this network.[79] Based on geographical location, the Program Implementer assigns each Trade Ally an Energy Advisor, who provides training and

[78] Focus on Energy. 2012. Nonresidential Sector Monthly Performance Report – December 2012.

[79] The Small Business Program Trade Ally training addresses the Program goals, delivery approach, use of a digital energy survey tool, invoicing and reporting procedures and customer service.

any support needed. The Energy Advisor also conducts quality assurance and satisfaction follow-ups with customers to ensure that Trade Allies are respectfully representing the Focus on Energy Small Business Program.

The Program Implementer provided the Evaluation Team with materials used to support Administrator and Implementer Staff training, outreach, and operations. The Team reviewed these and found that they provide comprehensive and clear documentation of:

- Policies, procedures, training, and resources for staff;
- Marketing plan, outreach, and education materials;
- Data collection and quality assurance and quality control (QA/QC) protocols;
- Roles and responsibilities;
- Program requirements;
- Process flowcharts and organizational charts.

For more details about the material review, see Appendix L.

Program Outreach and Marketing

The Small Business Program Implementer reported that Trade Ally outreach is the most successful recruiting channel, followed by utility letters, direct mail, and print advertisements. The Implementer said response to social media efforts was minimal. In addition, the Implementer noted utilities, when they send Small Business Program recommendations directly to small business customers, help in recruiting participants. Several Energy Advisors confirmed the success of this activity. The Implementer and Trade Allies reported that when utilities directly reach out to their customers, it helps establish Program legitimacy. Several Energy Advisors commented that Chamber of Commerce meetings are good venues for recruiting customers and promoting the Program to the small business community.

Trade Ally Perceptions about Customer Satisfaction and Awareness

The Project Implementer, Energy Advisors, and Trade Allies provided their opinions on the customer experience and anecdotes from their customer interactions.[80]

The Program Implementer reported that as part of installation follow-ups, it conducts a basic customer satisfaction survey. As of mid-December 2012, the Program Implementer surveyed between 300 and 400 customers and these indicated a high level of satisfaction. On a one-to-five scale, the average score was 4.85. Several Energy Advisors said a few customers had complained about equipment installations but that generally customers were excited about the Program.

Several Trade Allies commented that customers like the Small Business Program although they had some initial hesitation and disbelief that the measure packages were free or offered at reduced prices.

[80] The Evaluation Team did not conduct participant surveys for the Small Business Program in 2012 but they are planned for 2013.

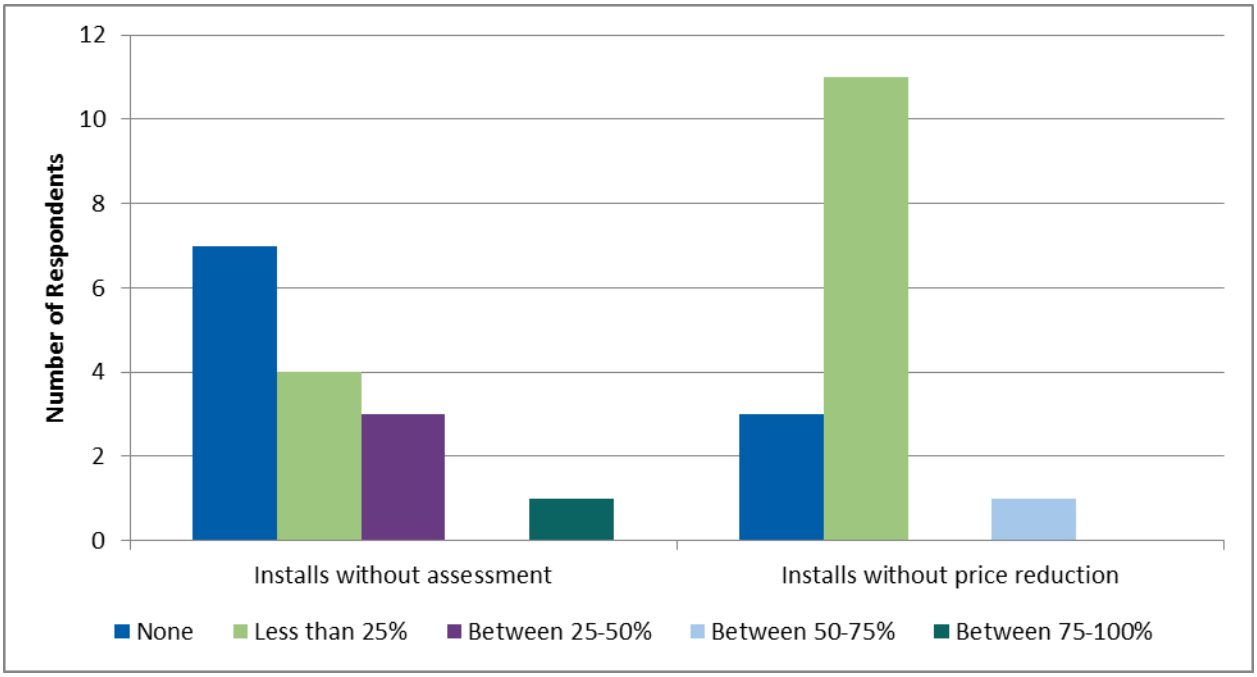
One Trade Ally said that when he sits down with the customer and goes over the energy savings and financial benefits, the customer usually agrees to participate.

When asked about customer awareness of the Program, two-thirds of Trade Allies said that their customers are not too aware of the Program. Several Trade Allies commented that none of their customers knew the Program well enough to know its product offerings and energy-saving benefits.

Trade Ally Perceptions about Customer Motivations

Trade Allies perceived both assessments and price reductions important program features that encourage customer equipment installation. As shown in Figure 57, seven Trade Allies reported that none of their customers would have installed equipment without the energy assessment. Eleven Trade Allies said that less than 25% of their customers would have installed equipment without the price reduction offered by the Small Business Program. Three responded that no equipment would have been installed without the price reduction.

Figure 57. Perception Of Project Installations Without Energy Assessments Or Price Reduction (n=15)[1]



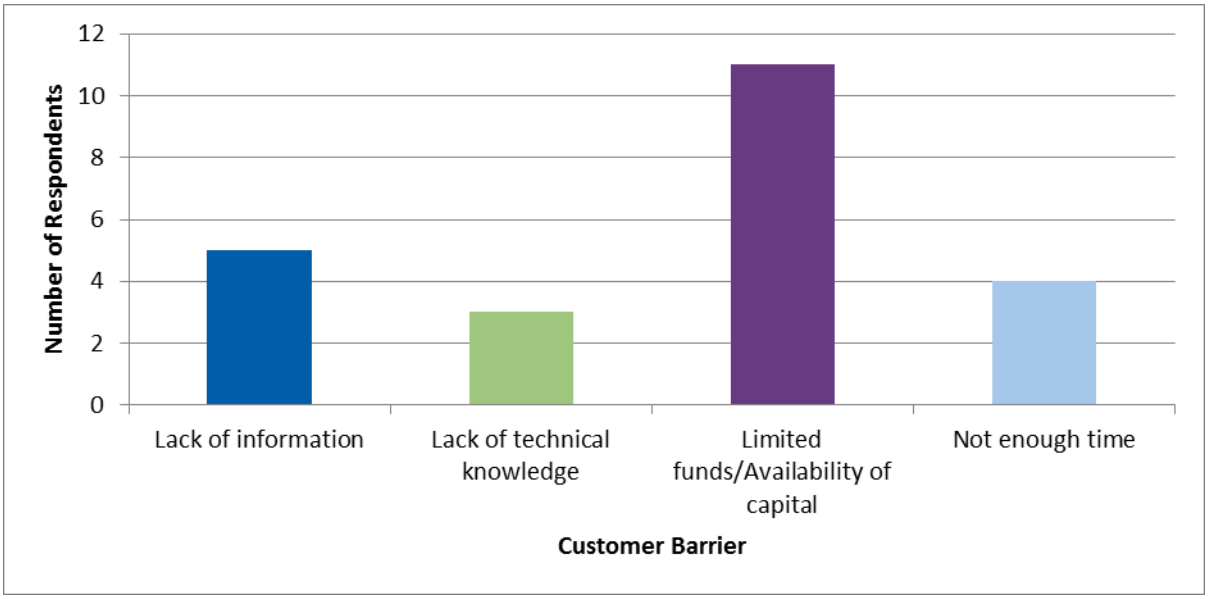
1 Percentages add up to more than 100% because the survey question allowed multiple responses.

The Trade Allies stressed the importance of free and reduced equipment costs in motivating participation, since many small businesses do not have the resources to upgrade equipment. Several added that even with assistance from the Program, some upgrades may still be too expensive. Still, SPECTRUM data indicated that for 90% of the projects, customers chose the Gold Energy Savings package. The Program Implementer and several Trade Allies confirmed this.

Trade Ally Perceptions about Customer Barriers

When asked what prevented customers from installing additional energy efficient-equipment, Trade Allies most often said limited funding (Figure 58). Trade Allies reported other obstacles to customer participation are lack of time and resource availability.

Figure 58. Trade Ally Perceptions Of Customer Barriers To Installing Additional Energy-Efficient Equipment (n=15)[1]

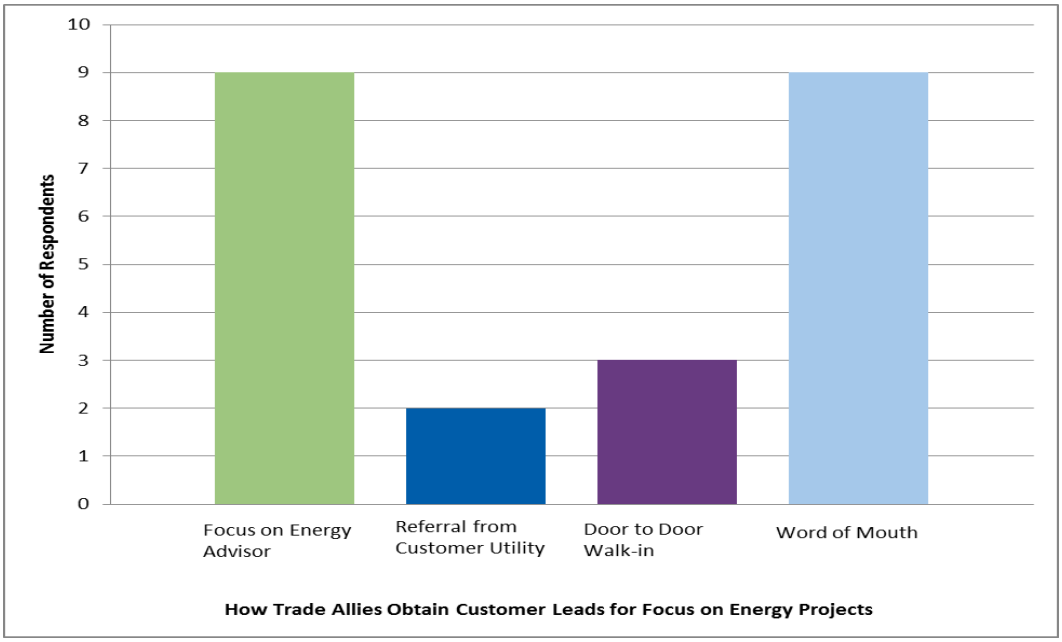


1 This interview question allowed for multiple responses.

Trade Ally Outreach to Customers

During interviews, participating Trade Allies reported that leads come primarily from the customer's Energy Advisor or through word-of-mouth (see Figure 59). Several added that a large portion of Program jobs come from existing customers or through cold calls.

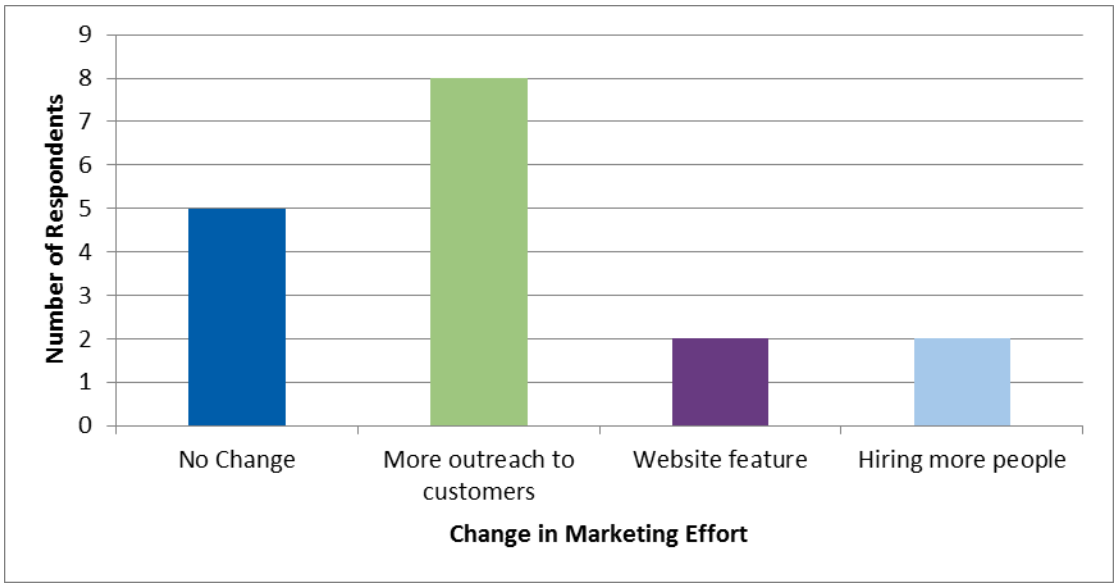
Figure 59. How Trade Allies Obtain Customer Leads For Focus On Energy Projects (n=15)[1]



1 This interview question allowed for multiple responses.

When asked if they had changed their marketing efforts due to participation in the Program, one-half of the Trade Allies said they had increased their outreach to customers. Two Trade Allies responded they have or were planning to hire additional employees specifically to help with Program efforts (Figure 60). Two Trade Allies added additional program information to their Website, and five Trade Allies reported no change.

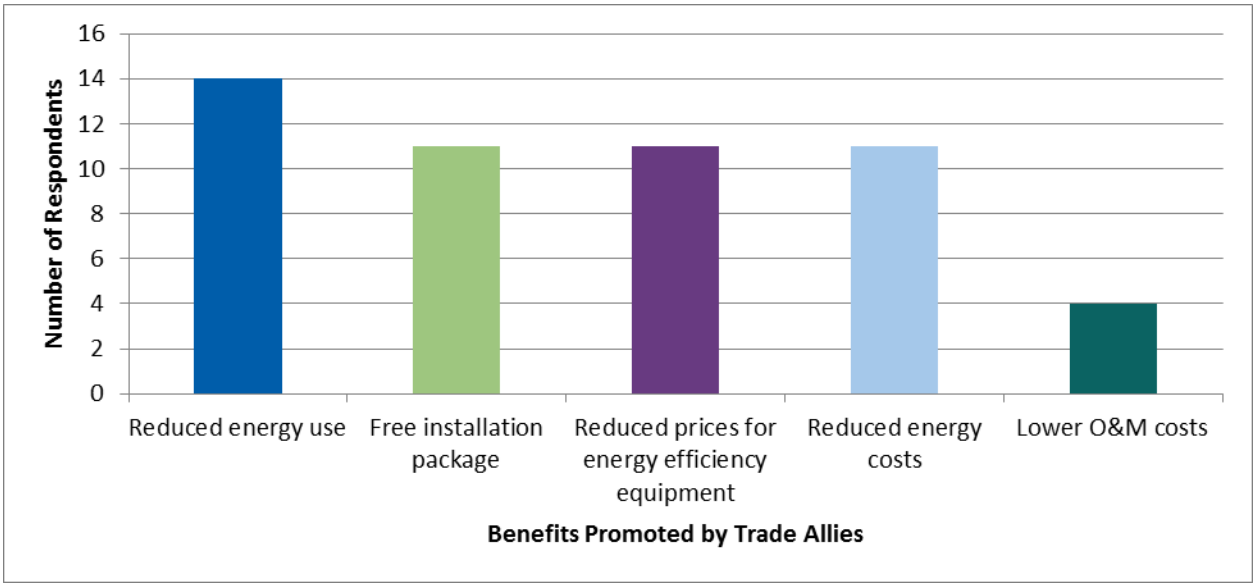
Figure 60. Changes In Marketing Efforts Of Participating Trade Allies (n=15)[1]



1 This interview question allowed for multiple responses.

As shown in Figure 61, all but one of the 15 Trade Allies interviewed promoted the reduction of energy use as a Program benefit to their customers. Most also promoted the availability of free or reduced costs for equipment and reduced energy costs.

Figure 61. Small Business Program Benefits Promoted By Trade Allies (n=15)[1]



1 This interview question allowed for multiple responses.

Business Incentive Program Referral

All stakeholders confirmed that Trade Allies refer customers to the Business Incentive Program when they identify measures that would qualify under that Program. One Energy Advisor noted that the iPad application supports immediate referrals to the Business Incentive Program. According to SPECTRUM, 40 customers completed projects under both the Small Business Program and the Business Incentive Program by January 2013.

Trade Ally Network

Customers are enrolled in the Small Business Program through Trade Allies. Once they agree to participate, the Trade Ally conducts an energy assessment and makes recommendations on applicable measures. Customers then decide what measures they want installed and directly pay the Trade Ally for any non-free equipment.

The Program Implementer reported that during the Program start-up phase, before many Trade Allies had registered, Energy Advisors reached out to customers and conducted the assessment. The Energy Advisor then referred customers to Trade Allies to install the measures.

Trade Ally Recruiting

The Small Business Program's reliance on Trade Allies means the Program Implementer needs to recruit and train new contractors to keep pace with Program targets. The Implementer, through the Energy

Advisors, engaged 30 to 40 new and active Trade Allies by the end of 2012, far exceeding its goal of 15. As of April 2013, the Implementer reports 130 active Trade Allies.

Recruitment of Trade Allies relies on outreach from Energy Advisors, who initially contacted electrical contractors who had participated in Focus on Energy's programs in the past. The Program Implementer then invited interested Trade Allies to a kick-off meeting during the first month of the Program launch to register and receive training.

The Energy Advisors followed up with Trade Allies after this initial meeting and approached other potential Trade Allies. The Advisors said they used the Focus on Energy past Trade Ally list, utility referrals to contractors, and word-of-mouth to help find interested contractors. All but one of the Trade Allies interviewed had participated with Focus on Energy prior to the start of the Small Business Program.

Trade Ally iPad and Energy Assessment Training

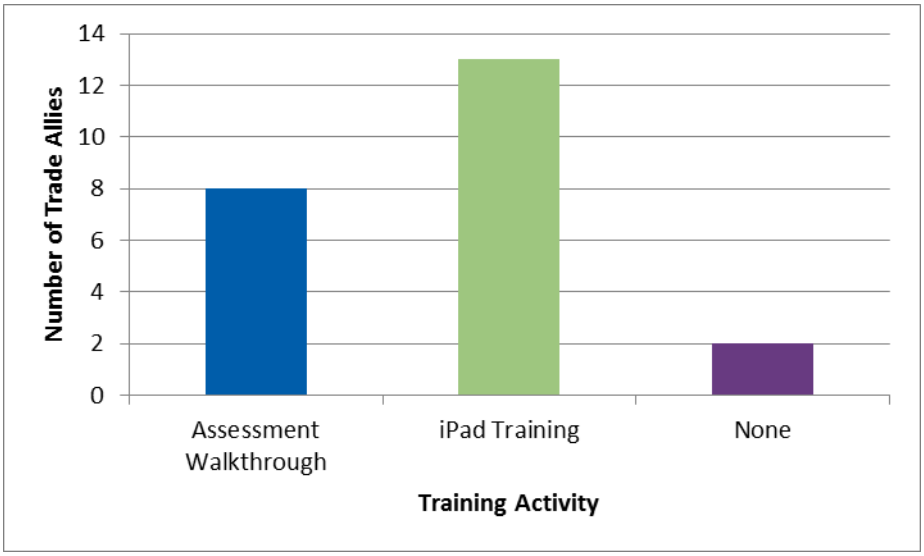
Instead of a paper-based application system, the Program Implementer developed an application for an iPad. Trade Allies use this iPad system to collect customer information while doing on-site assessments and record which measures are qualified and installed. The Implementer then uploads data to an internal database for verification and processing.

Several Trade Allies noted early technical issues with the iPad application, but they commented these have been fixed and that the application currently works great. One respondent complained that he would prefer to use his personal laptop instead of having to purchase a new device solely for Program use.

Energy Advisors train Trade Allies how to conduct the energy assessment and use the iPad application. The Program Administrator described the Energy Advisors as filling a mentorship role for the Trade Allies, using their knowledge and experience to help Trade Allies through any problematic assessments and answering any questions that come up during Program participation. All of the Energy Advisors said the training is key to Trade Ally success and that it works very well.

However, Trade Allies reported that some did not receive full training, as shown in Figure 62. Almost all (13) Trade Allies said they had received the iPad training, but only eight said they received training in how to conduct an assessment.

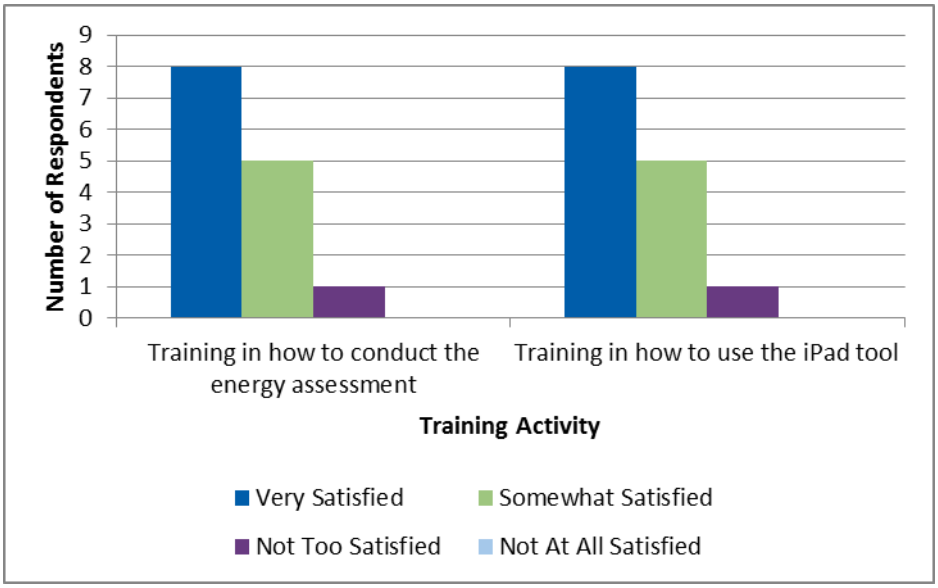
Figure 62. Trade Ally Participation In Training Activities (n=15)



When asked which training elements they found most useful to their businesses, 10 of 15 Trade Allies identified the iPad training, two said assessment walkthrough, and one said the training had not been useful to their business. Trade Allies suggested the training be expanded in length and quantity and requested a best practices or "lessons learned" guide.

Most Trade Allies responded positively to both the assessment and iPad application training (Figure 63). Those conveying dissatisfaction commented on the commitment of time necessary for training or lack of training.

Figure 63. Trade Ally Satisfaction With Training (n=15)

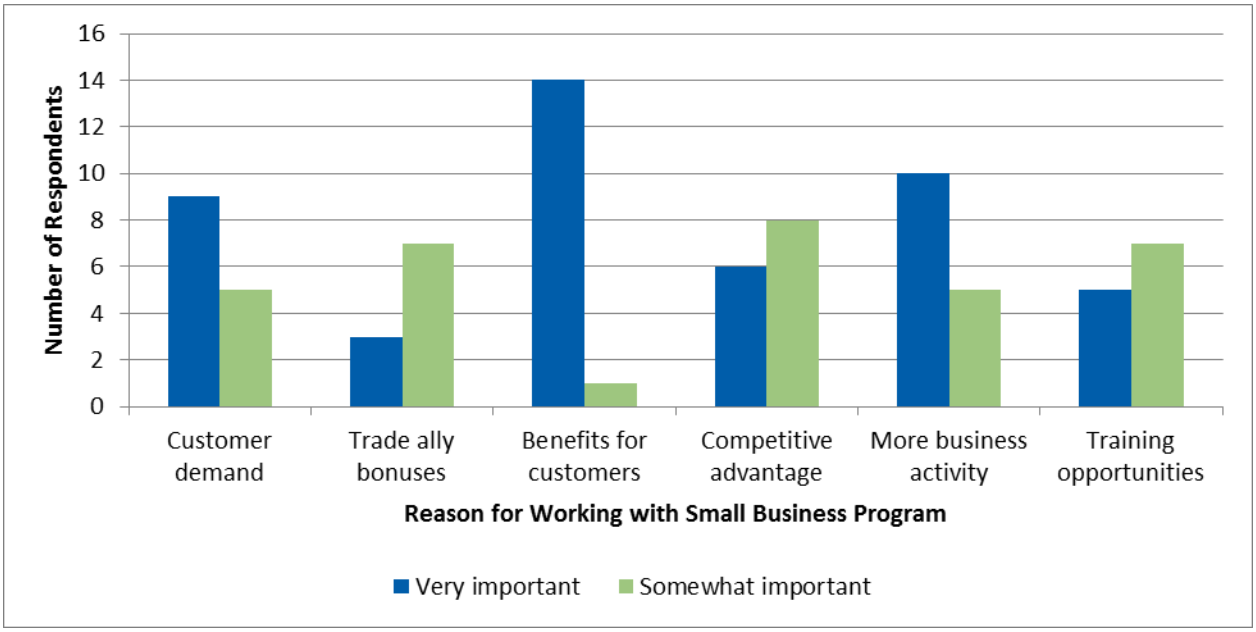


Participation Process and Experience

Reasons for Trade Ally Participation

Trade Allies rated the importance of six reasons for their participation in the Program (Figure 64). Almost all rated customer benefits as very important. Many said that more business activity and demand from customers were strong motivations.

Figure 64. Reasons For Interest In Working With The Small Business Program (n=15)



Trade Ally Communication

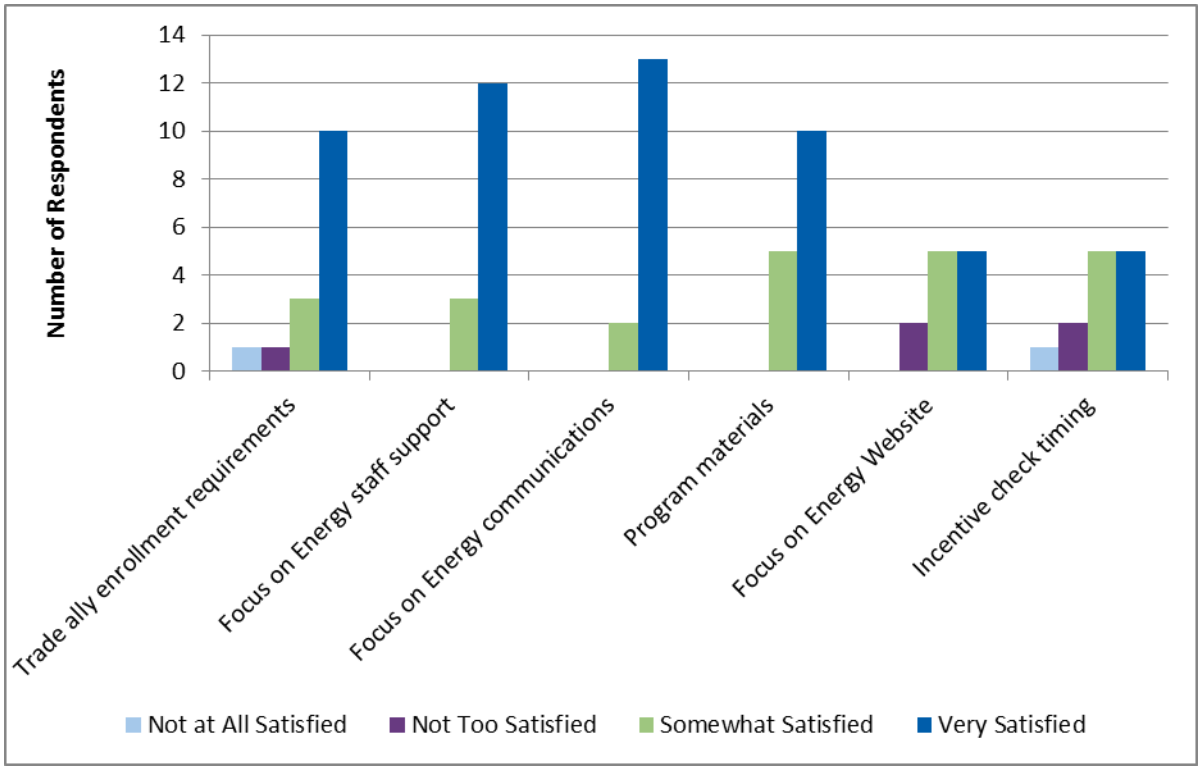
Program communication between an Energy Advisor and Trade Allies primarily occurs via telephone conversations or e-mail. Most of the Trade Allies (12 of 15) reported receiving Program information through the Focus on Energy newsletter and two reported that they received information through their professional organization. When asked how future communications should be handled, the majority reported that it should stay the same.

Trade Ally Satisfaction with Program Components

Trade Allies were very satisfied with communication and support from Focus on Energy, program materials, and enrollment requirements. They said they receive quick replies from their Energy Advisors or from Focus on Energy to questions that arise during Program jobs. On the other hand, as shown in Figure 65, only five Trade Allies rated the Website highly. Several commented on its limited usefulness or that it was confusing.

Trade Allies were generally satisfied with the timing of payments (Figure 65). Several Trade Allies desired faster payment as they front the cost of equipment for customers. Several reported initial problems with payment speed but said the speed had improved over time.

Figure 65. Trade Ally Satisfaction With The Small Business Program (n=15)



Enrollment requirements included registering as a Focus on Energy Trade Ally, having a Wisconsin electrical contractor license, and proof of general liability insurance coverage and an umbrella policy (if necessary). Ten Trade Allies said they found these requirements satisfactory (Figure 65), but five were dissatisfied due to:

- Time required to sign up;
- High insurance requirement;
- Requirement for electrical contractor certification.

When the Team asked Trade Allies how their experience with the Small Business Program could be improved, nine of the 15 did not suggest improvements. Suggestions among the remaining Trade Allies included the desire for more customer leads from Energy Advisors and more advertising and marketing support from Focus on Energy for the Program.

When asked about potential equipment to add to the Program, 10 Trade Allies recommended the addition of:

- LEDs ;
- Better eight-foot retrofit options;
- The inclusion of U-tube fixtures.

The Program Implementer confirmed this list and noted that several customers requested the same items and two additional items: parking lot and other exterior lighting.

Data Tracking and Payment Processing

After collecting information from customer energy assessments, Trade Allies upload the data from the iPad to the Program Implementer's database. The Small Business Program Implementer reported they must then manually enter customer data in SPECTRUM using summary reports from Trade Ally work orders. (The Program Implementer commented that its database can batch export, but that SPECTRUM cannot retrieve the data.)

SPECTRUM data confirmed that Administrator and Implementer Staff members are only entering completed projects, so no pipeline information is available except for in-process projects recorded in the Implementer's database. The Program Administrator said that the Implementer provides monthly progress reports. The Program Implementer commented that its database generates these reports and has the capability for more robust and current tracking for the Small Business Program.

The Program Implementer confirmed that it does not capture information about customers who choose not to participate. Instead, this is an aspect of the Trade Allies' sales approach. The Program Implementer added that this limits its ability to follow up with non-participating customers even though very few have refused the energy assessment.

Payment Processing

The Program makes a direct payment to the Trade Ally to cover the subsidized portion of equipment. To receive payment, the Trade Ally fills out the customer's application on the iPad. Staff uploads the application to the Program Implementer's database. After checking the application for completeness, the Implementer inputs the information into the SPECTRUM database. The Program Administrator then approves the application and sends the payment to the Trade Ally. The Program Implementer, Energy Advisors, and Trade Allies all confirm that the turnaround from application submission to payment occurs within 30 days on average. Several Trade Allies stated that the quick turnaround for payment is a great feature of the Program.

Program QA and Verification

The Small Business Program Operations Manual contains detailed descriptions and processes for QA and verification of installed measures. The Evaluation Team reviewed the QA and verification procedures and found these consistent with best practices for commercial programs.[81] The Program's QA and verification procedures include the following requirements:

- Energy Advisors will visit the first five installations of any new Trade Ally, five of the next 20 jobs, and 5% of all additional jobs after the first 25.
- Energy Advisor will check the installation of all Project measures, ensure customer satisfaction, identify any missed opportunities, and look for any other issues.
- Trade Allies are required to repair or correct any issues identified by the Energy Advisors within 10 days of notification, unless the issues involve emergency equipment.

The Implementer commented that five employees were hired to solely perform quality assurance. With the eight energy advisors, the Program reaches nearly 100% of program participants through QA visits and customer satisfaction phone calls.

Program Cost Effectiveness

The benefit cost (B/C) test, also known as a cost-effectiveness test, is used to compare the benefits of a demand side management program with the costs of the program. There are several tests used for evaluating energy efficiency cost-effectiveness. The benefit cost test used in Wisconsin is a modified version of the total resource cost (TRC) test. This test is a commonly administered test for evaluating energy efficiency programs. A description of the test can be found in Appendix H.

The CY 2012 Small Business Program, and Program carryover, was found by the Evaluation Team to be cost effective (a TRC ratio above 1). Table 150 below provides the Small Business Program costs and benefits:

Table 150. Small Business Programs Costs And Benefits

	Small Business Program
Incentive Costs	$2,306,427
Administration Costs	$340,285
Delivery Costs	$1,389,527
Incremental Measure Costs	$1,144,690
Total Non-Incentive Costs	$2,874,503
Electric Benefits	$8,657,438
Gas Benefits	$251,468
Emissions Benefits	$3,070,495.87
Total TRC Benefits	$11,979,401
TRC Net Benefits	$9,104,899
TRC Ratio	4.17

[81] Best Practice Benchmarking for Energy Efficiency Programs Website: http://www.eebestpractices.com/.

Evaluation Outcomes and Recommendations

The Small Business Program Implementer overcame early obstacles and a late start to nearly reach energy savings and outreach goals for 2012 with only six months of operation. The Program Implementer used innovative and adaptive marketing and operational strategies, the free energy assessment, the iPad application, and Energy Advisors as effective Program Trade Ally ambassadors. These efforts resulted in high customer participation rates, including purchase of the Gold Energy Savings package and additional funding for a Program extension through the first quarter of 2013.

The following outcomes and recommendations identify opportunities for improving the Program.

Impact Evaluation

Outcome 1. Per-unit deemed savings values are not constant for many lighting measures. For most lighting measures (excluding occupancy sensors and LED exit signs), the per-unit deemed savings value was variable. Program Implementers calculated annual energy savings (kWh) using site-specific hours of use values.

Recommendation 1. Document and track hours of use values for each lighting record within SPECTRUM to facilitate verification and evaluation.

Outcome 2. Savings values sometimes differ between Segments. For all non-lighting measures, the per-unit deemed savings values for each measure are constant, even between Segments (Commercial, Schools and Government). For lighting measures, the per-unit deemed savings values differ by Segment.

Recommendation 2. Enforce deemed savings values by Segment. This will provide better granularity and accuracy regarding deemed savings values, especially if key variables, such as hours of operation, can be tied to the Segment.

Outcome 3. Per-unit deemed savings values are constant for non-lighting measures. For all non-lighting measures, the per-unit deemed savings values for each measure are constant. This value was not always consistent with the planning assumption set forth in the cost-effectiveness calculator. For these measures, the Evaluation Team determined a 100% realization rate to reflect that the implementer correctly applied the deemed savings value.

Recommendation 3. Ensure consistency between cost-effectiveness calculators and deemed savings values applied in SPECTRUM.

Process Evaluation

Outcome 1. The high volume of growth and continued increase in demand for services may present a risk to consistent Program availability and management of market expectations. Trade Allies demonstrated the ability to generate customer response that exceeded Program expectations. The Program Implementer plans to increase the number of participating Trade Allies and reported negotiating for additional funding and increased targets. The Program could experience negative market reactions if funds are depleted rapidly and Trade Ally or customer expectations are not met. (Note: The

Program Implementer is working with the Program Administrator to ensure proper goals and funding levels for program continuation.)

Recommendation 1. Continue proactive planning for near and long-term growth to manage customer demand and ensure, if appropriate, successful continuation of the Program for the 2013 to 2014 Program cycle. Identify methods to better understand Trade Ally activities, customer demand, and market saturation so staff can better predict the Program volume. Manage Trade Ally expectations pro-actively with clear, ongoing communications about program funding availability.

Outcome 2. Energy Advisors successfully developed an effective Trade Ally network in a short amount of time. This network successfully engages small businesses, but training needs to be more consistent for both the assessment process and the iPad tool. Trade Allies also want varied training levels for both the assessment and iPad and a Trade Ally best practices guide.

Recommendation 2. Several Trade Allies requested more training on both the assessment and iPad. Ensuring that all Trade Allies receive consistent and thorough training on the iPad application and walkthrough experience with an Energy Advisor will help to meet this need. Create and provide to Trade Allies a best practice guide or a reference with answers to frequently asked questions about the Program. Include information on cross-selling to other programs in Focus on Energy, primarily the Business Incentive Program. Conduct an annual meeting for Trade Allies to share challenges, successes, and ideas for improvement.

Outcome 3. While Program activity and savings continue to grow, Trade Allies reported limited customer awareness. Trade Allies requested additional support from Focus on Energy to promote the Program and to overcome customer hesitation about Trade Allies representing the Program.

Recommendation 3. Although Trade Allies have a window decal and many customers receive Small Business Program information from their utility, consider providing Trade Allies with additional collateral to give them more credibility in interactions with their customers. Consider a laminated letter from Focus on Energy and their local utility confirming the Trade Ally's status. (Note: The Evaluation Team learned in 2013 that Trade Allies are now able to obtain letters of support from local utilities.)

Outcome 4. While information on participating customers is comprehensive the Program Implementer does not have good information on customers who decline to participate in energy assessments. Having information on such customers would be useful to the Program Implementer for conducting follow-ups and for future assessment activities that target nonparticipating customers and their experiences.

Recommendation 4. Require Trade Allies to collect customer information from the small businesses they approach but decline to participate in the Program. The Program Implementer can then reach out to these customers to ensure Program expectations are clear and to uncover any issues preventing participation. Consider offering an incentive to Trade Allies to collect these data.

Outcome 5. SPECTRUM does not allow for automated batch entry of Program 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 5. Investigate solutions to enable the Implementer to automatically upload data on completed jobs from its database into SPECTRUM.

Retrocommissioning Program

The Retrocommissioning Program launched November 1, 2012; Eleven Opportunity Assessments were submitted in the first month. However, no savings were attributed to the Program in 2012.

Design Assistance Program

The Design Assistance Program did not launch until January 1, 2013. No savings are attributed to the Program in CY 2012.

Nonresidential Segment Measure-Related Recommendations

The Evaluation Team reviewed a variety of measure-savings estimates and the application process. Due to the cross-program nature of the measures offered in the nonresidential energy efficiency programs, the opportunities for measure-related improvements and recommendations are presented at the segment level (for all nonresidential programs). The outcomes identified here address how savings are estimated, what information is collected about projects, how measures are categorized, and early removal of installed measures (specifically faucet aerators).

Evaluation Outcomes and Recommendations

Outcome 1: Deemed load profiles for variable-frequency drives (VFD) are not sufficient to capture the range of savings available from these projects. The Evaluation Team found highly variable realization rates on VFD installation projects. The uniformity observed in data from project to project suggests the use of a default profile that did not represent actual post-retrofit loading conditions. The wide range of VFDs available may require additional savings estimates or treatment of drives outside a standard range as a custom project.

Recommendation 1. Develop load profiles specific to VFD projects. One way this can be accomplished is by using the PumpSave Energy savings calculation tool created by ABB, a leading VFD manufacturer. This tool is available for public use on ABB's Website. The tool requires that the user provide several inputs including an estimation of annual operating hours, pump HP, motor efficiency, VFD efficiency, nominal volumetric flow rates, head pressures, liquid densities, and control system and strategy type.

Outcome 2: Application or rebate forms could be modified to collect data needed to improve estimates of savings and certainty in evaluation reviews.

- **Lighting forms do not collect data needed to evaluate actual vs. deemed savings**. The current form collects baseline data in prescribed ranges, which introduces uncertainty between deemed energy savings and actual realized energy savings.
- **Recommendation 2a:** Collect actual baseline wattages and lighting power density
- **Air conditioning equipment with limited-use applications received the same savings credit as other high-use applications.** Deemed savings values for the installation of high-efficiency air conditioning equipment does not take into account scenarios where the equipment will be in a low or infrequent use application. This results in an over-estimation of savings and compromises simple payback assumptions.
- **Recommendation 2b:** Collect anticipated operating hours for air conditioning equipment during the application process and modify deemed savings to provide options for high and low use operations.
- **For infrared heating units,** the composition of emitter material is not captured. It is critical to know the composition of the emitter material in order to determine the emissivity of the radiating surface and subsequently calculate radiant output or efficiency.

- **Recommendation 2c:** Add the composition of the emitter surface to application forms for infrared heaters. Common materials include calorized aluminum steel, hot rolled steel, aluminized steel, and stainless steel. It may be advantageous to include a list of the more commonly used materials and then to provide an 'Other' option and include space for the customer to specify the composition.
- **Actual savings for steam trap survey and repair/ replacement projects is significantly more variable than the current deemed savings value accommodates.** A key parameter in estimating the energy savings from replacing a failed steam trap is the device orifice diameter. The CY 2012 evaluation sample included several steam trap survey and repair projects that ended up with abnormally high realization rates. This is due to significant discrepancies between the program's market-assumed distribution of orifice sizes when deeming savings versus the actual distribution of sizes observed in the field. The deemed savings value assumes an average orifice diameter of 1/16-inch and an overall distribution of sizes ranging from 1/32 of an inch to 3/8 of an inch, assuming that 1/16-inch orifice diameters are most prevalent. Evaluators encountered orifice diameters exceeding 3/8 of an inch on most of the sampled projects.
- **Recommendation 2d.** Collect data on the average orifice diameter along with the steam line pressure in the application and consider multiple deemed savings values associated with differing orifice diameters.
- **Compressed air pressure/flow controller** project savings calculations would be more verifiable if pre- and post-installation power measurements were recorded and submitted on rebate applications.
- **Recommendation 2e.** Consider requiring pre- and post-installation power requirements on large compressed air pressure/flow controller projects and add measurements to rebate application forms.

Outcome3: Baselines used in energy savings calculations could be more consistent for some measures.

- **Chiller Projects:** Both ASHRAE Standard 90.1-1989 and ASHRAE 90.1-2007 were used to estimate baseline annual energy consumption (kWh) and demand (KW) for projects in CY2012.
- **Recommendation3:** Standardize the version of ASHRAE 90.1 that stakeholders use when deeming baseline equipment efficiencies or stipulate minimum efficiency requirements based on system capacity. Consider whether baseline assumptions should vary with retrofit or equipment replacement projects versus new construction.

Outcome 4: Savings estimates from chiller projects were based on Integrated Part Load Values (IPLV) calculations. The Air-Conditioning, Heating, and Refrigeration Institute's IPLV are typically less representative of anticipated operating conditions.

Recommendation 4. Use Non-Standard Part Load Values, if known and available, to calculate incentive amounts for HVAC electric chiller equipment projects.

Outcome 5: Categorizing steam trap survey and repair/replacement projects in the same measure group would simplify savings estimation. The application form categorizes Steam Trap Surveys as a boilers and burners measure and Leaking Steam Trap Repairs as a Heating, Ventilation, and Air Conditioning measure. Leak repairs are reliant upon the findings of the survey and savings analyses are typically performed concurrently.

Recommendation 5. Categorize both measures as boilers and burners measures given the fact that savings for both originate from a reduction in steam demand on a boiler.

Outcome 6: Program records do not adequately identify boilers in combination space heating and water heating applications. The Evaluation Team encountered several boiler replacement projects involving boilers used for both space and domestic water heating. The Team also encountered an indirect water heater project.

Recommendation 6. Develop savings estimates for these two scenarios.

Outcome 7: The Evaluation Team observed that a number of new construction projects included in the FY2012 evaluation used above-average lighting power densities (W/ft2) when establishing baseline energy consumption. For new construction, the lighting power density should be capped so that values higher than code requirements cannot be assumed.

Recommendation 7: When incenting new construction projects, standardize maximum allowable lighting power densities (W/ft2) used for baseline assumptions.

Outcome 8: There is a high rate of removal for low-flow faucet aerators from direct install sites.

Recommendation 8: This is a common issue with direct-install programs. Potential solutions could include greater education and awareness.

Renewables Findings

In CY2011, after the awarding of the Program Administration contract, and based upon the cost effectiveness requirements established in docket 5-GF-191 Reference # 158228, the Focus on Energy renewable energy incentive programs were terminated. A significant number of renewable energy projects had already been approved when the programs concluded, many of which take over a year to go through the design and installation steps. The commitments to provide incentives for these projects have been, and will continue to be, honored.

In docket 5-GF-191 Reference # 163778 dated April 26, 2012 the Public Service Commission of Wisconsin issued an order pertaining to renewable resource guidelines. This order established funding levels for new renewable energy programs, and funding allocations to specific technologies. For CY2012, in recognition of the significant level of outstanding commitments from previous years to fund renewable energy projects, no additional technology specific funding allocation was established. Table 151 presents the breakdown of incentives for renewable energy projects completed in 2012. In CY 2013 and CY 2014, the commission has ordered that $10 million be set aside for renewable energy incentives, that 75% of these incentives be directed to biomass, biogas and geothermal (collectively referred to as group 1) projects; and that 25% of incentives be directed to solar thermal, photovoltaic, and wind (collectively referred to as group 2) projects.

Table 151. CY 2012 Renewable Energy Projects

		Residential		Nonresidential		Total	
		Incentive Costs	% of Measures	Incentive Costs	% of Measures	Incentive Costs	% of Measures
Group 1	Biogas		0%	$1,804,197	40%	$1,804,197	35%
	Geothermal	$35,750	6%	-	0%	$35,750	1%
	Subtotal	$35,750	6%	$1,804,197	40%	$1,839,947	36%
Group 2	Solar Electric	$442,286	70%	$1,281,856	29%	$1,724,142	34%
	Solar Thermal	$148,742	24%	$206,827	5%	$355,569	7%
	Wind	$5,376	1%	$1,181,438	26%	$1,186,814	23%
	Subtotal	$596,404	94%	$2,670,122	60%	$3,266,526	64%
Grand Total		**$632,154**	**100%**	**$4,474,319**	**100%**	**$5,106,473**	**100%**