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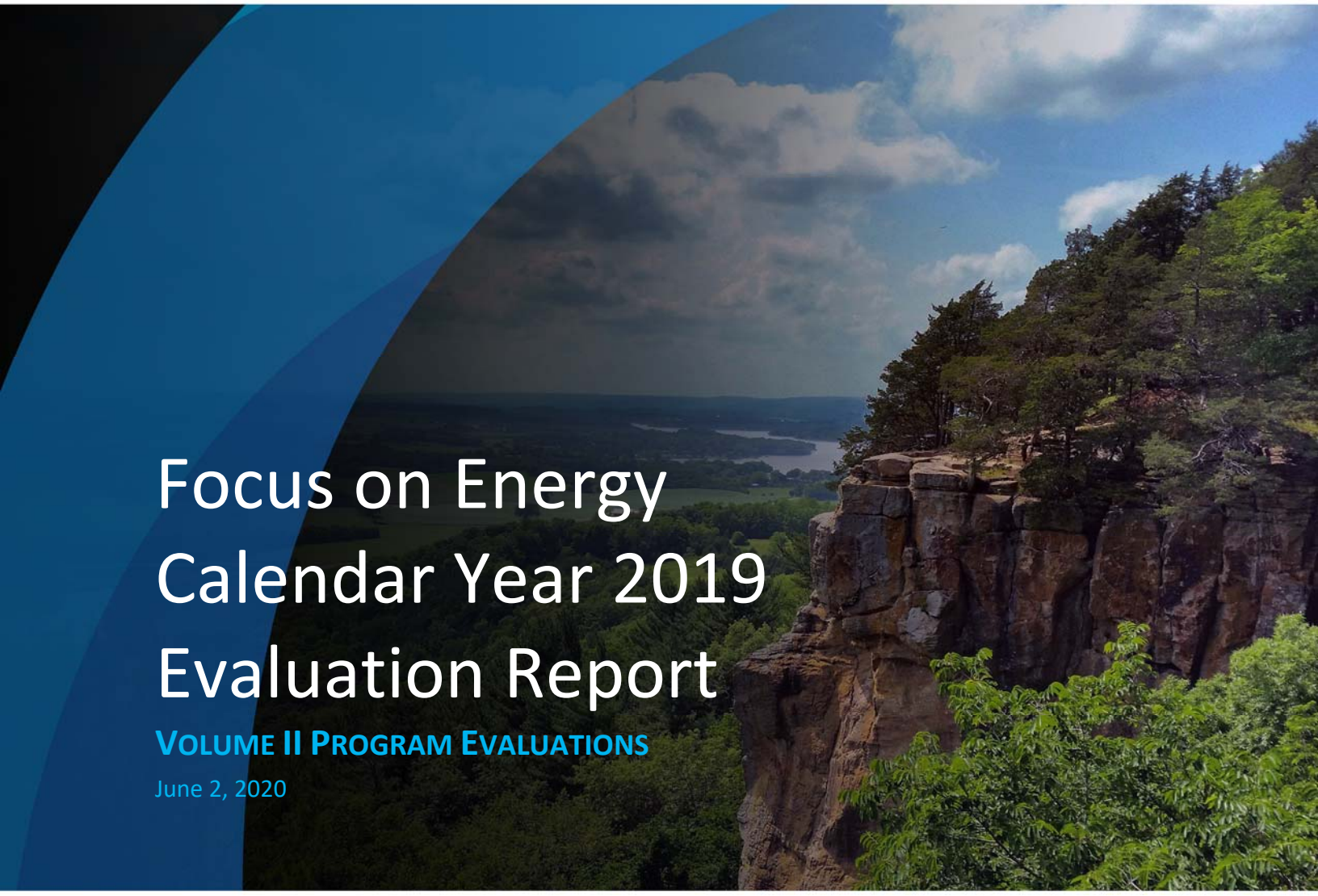

Focus on Energy Calendar Year 2019 Evaluation Report

VOLUME II PROGRAM EVALUATIONS

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Acronyms and Abbreviations

Acronym	Term
A/C	Air conditioner
AFUE	Annual fuel utilization efficiency
APS	Advanced power strip
ARCA	Appliance Recycling Centers of America
BPC	Building performance consultant
BPI	Building Performance Institute
CALP	Common Area Lighting Package
CBSO	Community Small Business Offering
CLI	Comprehensive lighting initiative
CPI	Communications Providers Initiative
COP	Coefficient of precision
CY	Calendar year
DHW	Domestic hot water
DOE NZER	U.S. Department of Energy Net Zero Ready
DSM	Demand-side management
ECM	Electronically commutated motor
EBTU	Express building tune-up
EER	Energy efficiency rating
EISA	Energy Independence and Security Act
EM&V	Evaluation, measurement, and verification
EUL	Effective useful life
FEMA	Federal Emergency Management Agency
GSHP	Ground-source heat pump
HVAC	Heating, ventilation, and air conditioning
IQT	Income-qualified track
ISR	In-service rate
KAM	Key account manager
KPI	Key performance indicator
Kw	Kilowatt
kWh	Kilowatt per hour
LLLC	Luminaire level lighting control
LPD	Lighting power density
MCIL	Midstream Commercial Kitchen Equipment Offering
MCKE	Midstream Commercial and Industrial Lighting Pilot
MMBtu	Million British thermal unit
MMID	Master measure identification
MOU	Memorandum of understanding
MThm	Thousand therms
MWh	Megawatt per hour
NLC	Networked lighting controls
NPS	Net promoter score
NTG	Net-to-gross
PPS	Probability proportional to size
PRISM	PRInceton Scorekeeping Method

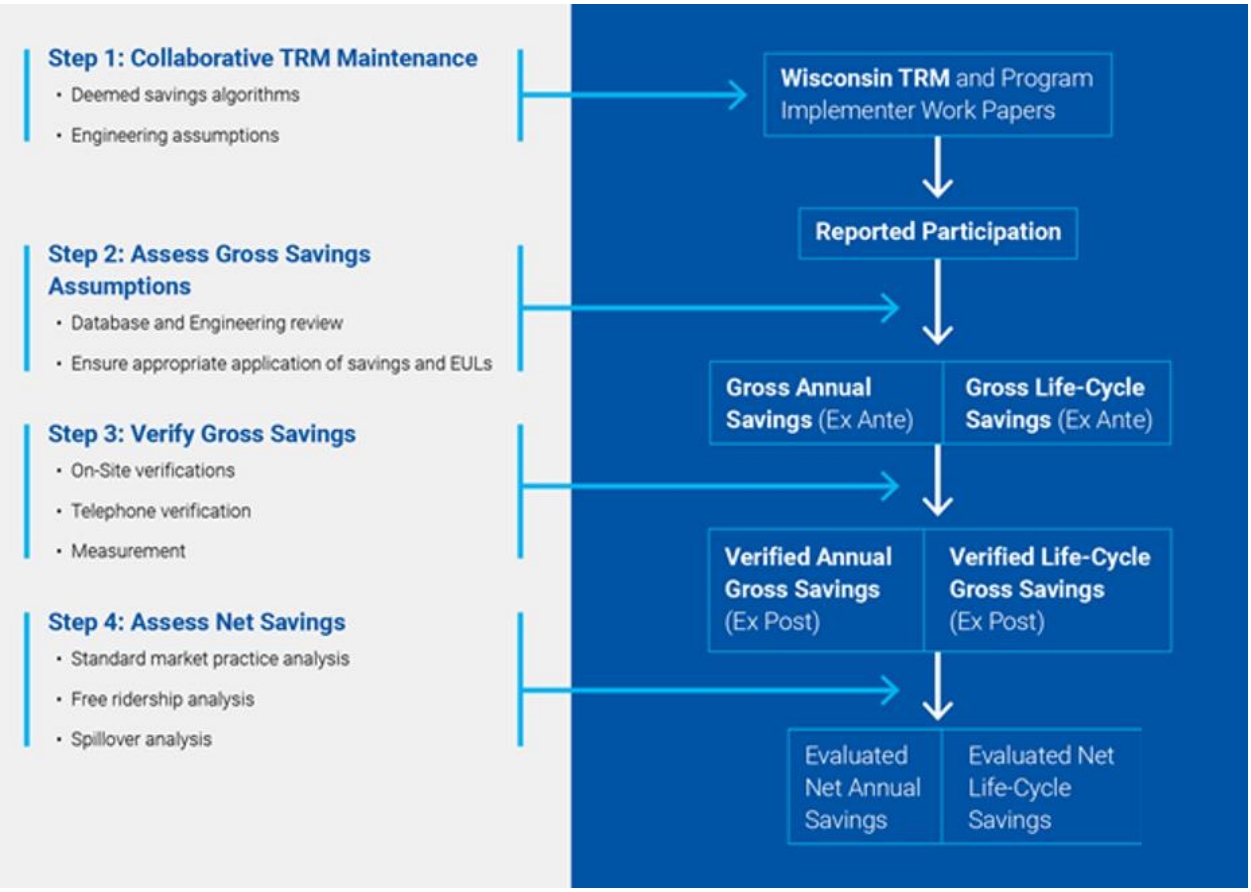
PSC	Public Service Commission of Wisconsin
PTAC	Packaged terminal air conditioner
PTHP	Packaged terminal heat pump
PV	Photovoltaic
RESNET	Residential Energy Services Network
RFP	Request for proposal
ROI	Return on investment
SEER	Seasonal energy efficiency rating
SPECTRUM	Statewide Program for Energy Customer Tracking, Resource Utilization, and Data Management
TRC	Total resource cost test
TRM	Wisconsin Technical Reference Manual
UEC	Unit energy consumption
UMP	Uniform Methods Project
UPC	Universal product code
WUDC	Wisconsin Uniform Dwelling Code

Introduction

Volume II of the Focus on Energy CY 2019 Evaluation Report presents program-specific evaluation findings and details about specific evaluation approaches and results for the residential and nonresidential programs. This introduction presents additional information on the overall roles and responsibilities of the Evaluation Team as well as descriptions of standard evaluation practices and approaches the Team used across multiple program evaluations.[1]

The diagram presented as Figure 2 of Volume I, and repeated here as Figure 1 in Volume II, is a useful summary of the steps involved in the calculation of net savings from the gross savings recorded in the program tracking databases. In addition to these steps, many planning and coordination activities are a part of the evaluation process. Following this introduction, Volume II presents program-specific evaluation findings and greater details about evaluation approaches and results.

Figure 1. Evaluation Steps to Determine CY 2019 Net Savings



[1] The Evaluation Team comprises Cadmus, Apex Analytics, and Nexant.

To accomplish evaluation steps 1 through 3, the Evaluation Team coordinates with staff from the Public Service Commission of Wisconsin (PSC), the Program Administrator, and Program Implementers to assess the measures expected to be installed across programs in future years. To determine priorities for additional research, the Evaluation Team also reviews the deemed savings or algorithms contained in the technical reference manual (TRM) and entered into Statewide Program for Energy Customer Tracking, Resource Utilization, and Data Management (SPECTRUM), the program tracking database.

The Evaluation Team prioritizes measures for evaluation, measurement, and verification (EM&V) that demonstrate the highest priority by meeting one or more of the following criteria:

- New to the programs
- Expected to contribute an increasing share of savings
- Have experienced technical or other market changes (such as increased energy codes or standards)
- Have significant uncertainty around the savings calculation (independent measurement of key assumptions are dated)

The Team then applies the findings from these activities to the savings calculations summarized in the Evaluation Report, which ultimately end up in the TRM.

Wisconsin Focus on Energy Technical Reference Manual

The Wisconsin Focus on Energy TRM is a document managed collaboratively by the Program Administrator, Program Implementers, Evaluation Team, and PSC staff. The information contained in the TRM presents the consensus calculations of the electric and gas energy savings and the electric demand reductions achieved from installing the energy efficiency and renewable energy technologies supported by Focus on Energy programs. The TRM is publicly available on the Focus on Energy website.[2]

The values presented in the TRM fall into one of two categories:

- **Deemed savings.** Specific per-unit savings (or demand reduction) the Program Administrator, Program Implementer, Evaluation Team, and the PSC have accepted as reliable because the measures, and the uses for these measures, are consistent and because sound research supports the savings achieved.
- **Savings algorithms.** The equations used for calculating savings (or demand reductions) based upon project- and measure-specific details. The TRM also makes these calculations transparent by identifying and justifying all relevant formulas, variables, and assumptions.

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[2] Public Service Commission of Wisconsin. May 2020. Wisconsin *Focus on Energy 2019 Technical Reference Manual.* Prepared by Cadmus. https://www.focusonenergy.com/sites/default/files/2019_TRM_Final_Update_0.pdf

The TRM is also a reference guide for how program stakeholders classify measures in SPECTRUM, the programs' tracking database. The Evaluation Team revises the document annually to account for any changes to the programs and technologies.

Deemed Savings Report

The annual deemed savings report details changes or updates to deemed savings or savings algorithms in the TRM based upon evaluation measurement and verification activities. The Evaluation Team prepares and circulates the report for review among the primary members of the Focus on Energy team including the Program Administrator, the Program Implementers, and the PSC. After this review process, the Evaluation Team incorporates the findings into the next iteration of the TRM.

Work Papers

Although evaluation activities often initiate updates to the TRM through the deemed savings report process, Program Implementers can also initiate revisions or additions to the TRM. Instead of a deemed savings report, Program Implementers prepare work papers to present the savings assumptions for new measures or, when appropriate, revisions to the savings calculations for existing measures. They submit these work papers to the Program Administrator, who forwards them to the Evaluation Team and the PSC for review, comment, and approval. Once a work paper receives final approval from the PSC, the Evaluation Team incorporates the work paper into the next iteration of the TRM.

Standard Evaluation Methods

The Evaluation Team uses several standard methods across evaluation cycles to assess the impact of Focus on Energy programs: tracking database review, project audits, and on-site inspections. This introduction details each of these methods. The individual program chapters that follow specify when the Evaluation Team applied these (or other methods) during the current or previous evaluation cycles.

Tracking Database Review

For each program, the Evaluation Team reviews the tracking database, SPECTRUM, for completeness and quality of data. The review includes the following activities:

- Download and review data for projects completed during the program year (January 1 to December 31 for each calendar year [CY], based on the "payment approved date" in SPECTRUM)
- Check program totals against program status reports generated by SPECTRUM
- Verify the presence and completeness of key data fields (savings, incentives, quantities, etc.)
- Check for duplicate entries
- Reassign adjustment measures to original application IDs (where possible) using supplemental tracking databases from the Program Administrator

Project Audits (Engineering Desk Review)

The Evaluation Team reviews SPECTRUM for complete and accurate key project documentation, including the following information:

- Project applications
- Savings workbooks
- Savings calculations performed by participants or third-party contractors (if applicable)
- Energy audits or feasibility studies
- Customer metered data
- Customer billing data (monthly utility bills)
- Invoices for equipment or contracting services
- Other documentation submitted to Focus on Energy

On-Site Inspections

For projects selected for evaluation, Evaluation Team inspectors verify the presence of equipment at a project site and collect data through a variety of methods such as installing data loggers or taking spot measurements of power usage. Inspectors may also gather data by reviewing daily operations and maintenance logs, gathering operations data from central energy management systems, and reviewing historical trend data. Inspectors may also ask customers to initiate trends during a site visit to collect real-time energy consumption data and then follow up with the customer several weeks later to obtain the results.

RESIDENTIAL PROGRAMS

This section presents the evaluation results for CY 2019 for these residential programs.

- Appliance Recycling
- Home Performance with ENERGY STAR
- Multifamily Energy Savings
- New Homes
- Online Marketplace
- Retail Lighting and Appliance
- Simple Energy Efficiency

Appliance Recycling Program

The Appliance Recycling Program offers customers incentives to expedite the retirement of old, inefficient appliances in order to reduce peak demand and increase annual energy savings. Through the CY 2019 Program, Focus on Energy offered customers free pick-up and recycling of old appliances, with a $20 incentive for each refrigerator or freezer recycled (limited to two per address every three years). To be eligible for pick-up through the Program, a customer's refrigerator or freezer had to be in working condition and between 10 and 30 cubic feet in size in addition to other logistical requirements. The Program Implementer arranged for these appliances to be dismantled and recycled in an environmentally responsible manner.

Appliance Recycling Centers of America, Inc. (ARCA) has implemented the Program since it relaunched in CY 2017, and APTIM serves as the Program Administrator.[3]

Table 1 lists actual Program spending, savings, participation, and cost-effectiveness in CY 2019 and CY 2018.

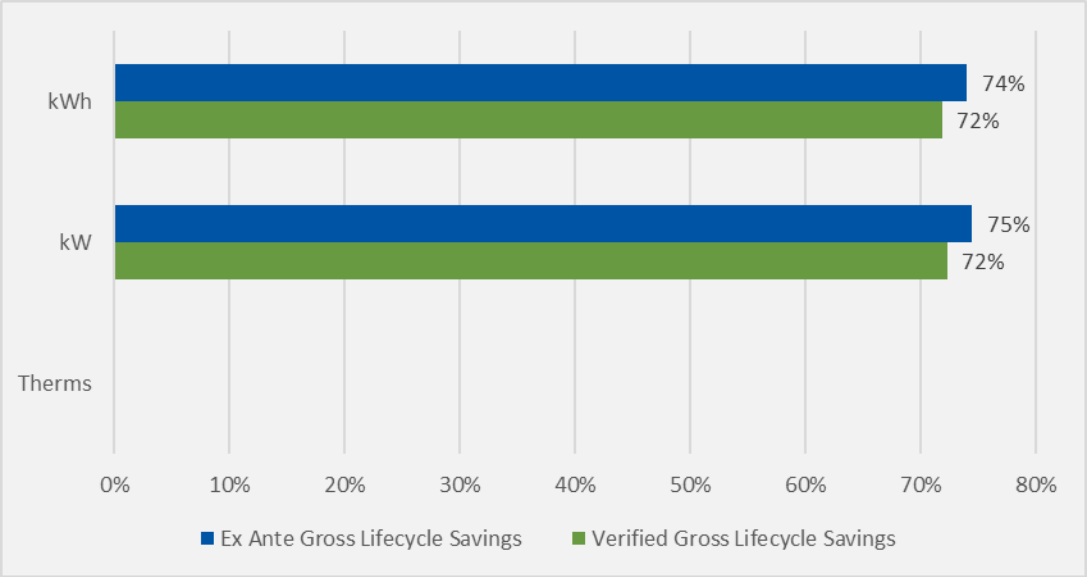
Table 1. Appliance Recycling Program Summary

Item	Units	CY 2018	CY 2019
Incentive Spending	$	$465,675	$218,725
Participation	Number of Participants	12,074	9,627
Verified Gross Lifecycle Savings	kWh	100,878,456	81,910,377
	kW	1,228	960
	therms	0	0
Verified Gross Lifecycle Realization Rate	% (MMBtu)	80%	97%
Annual NTG Ratio	% (MMBtu)	53%	43%
Net Annual Savings	kWh/year	5,389,308	3,560,424
	kW	654	418
	therms/year	0	0
Net Lifecycle Savings	MMBtu	184,079	121,482
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	1.92	1.31

Figure 2 shows the percentage of gross lifecycle savings goals achieved by the Appliance Recycling Program in CY 2019. The Program did not achieve its electric savings goals.

[3] The Appliance Recycling Program was suspended temporarily from November 2015 through December 2016 because of complications with the Program Implementer at that time. The Program relaunched in January 2017.

Figure 2. Appliance Recycling Program Achievement of CY 2019 Gross Lifecycle Savings Goals



The 100% *ex ante* gross lifecycle savings reflects the Program Implementer's contract goals for CY 2019. Verified gross lifecycle savings contribute to the Program Administrator's portfolio-level goals.

Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted process and impact evaluations of the CY 2019 Appliance Recycling Program. The Team designed its evaluation, measurement, and verification approach to integrate multiple perspectives in assessing Program performance. Table 2 lists specific data collection activities and sample sizes used in the evaluations.

Table 2. CY 2019 Data Collection Activities and Sample Sizes

Activity	CY 2019 Sample Size (n)
Program Actor Interview	1
Tracking Database Review	Census
Participant Surveys	170
Ongoing Participant Satisfaction Surveys	1,567

Program Actor Interviews

In October 2019, the Evaluation Team interviewed the Program Administrator about the status of the Program. The discussion focused on high-level changes in CY 2019 and their outcomes, general performance including areas of success and potential concerns, and potential changes for CY 2020.

Tracking Database Review

The Evaluation Team reviewed the census of Appliance Recycling Program records in the Focus on Energy's database, SPECTRUM. This review involved completing the following tasks:

- Thoroughly review the data to ensure SPECTRUM totals matched the Program Administrator's reported totals
- Check for complete and consistent application of information across data fields (e.g., measure names, first-year savings applications, effective useful life applications)

Participant Surveys

The Evaluation Team conducted telephone surveys with 170 customers who participated in the CY 2019 Program. The survey asked questions about the following:

- How the participant became aware of the Program
- How the units were used prior to being recycled (i.e., as a primary or secondary unit)
- Replacement of recycled units
- Attitudes toward energy usage
- Household demographics

The Team randomly selected customers from the total participants in the SPECTRUM database as of September 2019 and structured the sample to achieve 90% confidence at ±10% precision for participants who recycled refrigerators (100 surveys) and participants who recycled freezers (70 surveys).

Ongoing Participant Satisfaction Surveys

The PSC requested that the Evaluation Team conduct satisfaction surveys beginning in CY 2019 for the CY 2019–CY 2022 quadrennium, continuing the practice established for the previous quadrennium in CY 2015. There were two objectives for these satisfaction surveys:

- Understand customer satisfaction on an ongoing basis and respond to any changes in satisfaction before the end of the annual reporting schedule
- Help to facilitate timely follow-up with customers to clarify and address service concerns

The Team used SPECTRUM data to sample CY 2019 participants and administered web-based satisfaction surveys throughout the year. During the first half of CY 2019, the Team supplemented the web-based surveys with mailed paper surveys sent to participants without email addresses on file. The Team combined results from both modes for conducting the analysis. In total, 1,567 customers responded to the CY 2019 survey regarding several topics, such as these:

- Overall satisfaction
- Satisfaction with Program staff
- Likelihood of recommending the Program

- Likelihood of initiating another energy efficiency improvement
- Open feedback regarding the Program (comments and suggestions)

Impact Evaluation

To calculate gross savings, the Evaluation Team reviewed the Program tracking data provided by the Program Implementer then combined these data with part-use factor information gathered from participant surveys. To calculate net savings, the Team used participant survey data to determine freeridership.

This section provides impact evaluation findings for the Program, based on these methods:

- Tracking database reviews
- Participant surveys
- Multivariate regression modeling

Evaluation of Gross Savings

The Evaluation Team reviewed SPECTRUM as well as the Program Implementer's tracking database and applied the most recent research to estimating the gross savings, as described below.

Tracking Database Review

The Evaluation Team reviewed the CY 2019 data contained in SPECTRUM and the Program Implementer's tracking database for completeness and quality. The Program database review was necessary because SPECTRUM does not contain many of the appliance characteristics—most importantly, size, age, and configuration of Program units—that are necessary for estimating verified gross savings.

The Evaluation Team received preliminary Program tracking data in September 2019 and drew the sample for participant surveys. The Team made no other adjustments to the SPECTRUM *ex ante* savings after reviewing the tracking data.

Verified Unit Energy Savings

In CY 2019, as in prior evaluations, the Evaluation Team calculated gross savings for the Appliance Recycling Program following these steps:

1. Model unit energy consumption (UEC) by applying CY 2019 Program measure characteristics to regression models that are based on metered data
2. Apply part-use factors (derived through CY 2019 participant surveys) to the UEC to calculate the average per-unit gross savings for the CY 2019 appliances
3. Apply the per-unit energy savings to all measures in the tracking data to calculate gross Program savings.

A detailed explanation of the multivariate regression modeling and the part-use factor methodology and results can be found in *Appendix H. Measure Analysis* in Volume III.

Table 3 shows the modeled UEC and calculated part-use factors for refrigerators and freezers. The unit energy consumption increased from CY 2018 for both refrigerators and freezers. Refrigerator consumption increased from 943 kWh per unit to 1,014. Freezer consumption increased from 799 kWh per unit to 881 kWh per unit in CY 2019. The part-use factor for refrigerators decreased, from 0.86 in CY 2018 to 0.77 in CY 2019. The part-use factor for freezers increased from 0.76 in CY 2017 (the most recent Appliance Recycling Survey) to 0.84 in CY 2019. These changes in part-use factors between CY 2017 and CY 2019 were statistically significant for both appliance types.

Table 3. CY 2019 Appliance Recycling Program Gross Per-Unit Savings by Measure

Measure	Unit Energy Consumption (UEC) (kWh/Year)	CY 2019 Part Use Factors	Verified Gross Per-Unit Energy Savings (kWh/Year) (UEC x Part-Use Factor)
Refrigerator	1,014	0.77	783
Freezer	881	0.84	744

Verified Gross Savings Results

Table 4 lists the annual and lifecycle realization rates for the CY 2019 Program. Overall, the Program achieved a first-year evaluated realization rate of 97%, weighted by total (MMBtu) energy savings.

Table 4. CY 2019 Appliance Recycling Program Annual and Lifecycle Realization Rates

Measure	Annual Realization Rate				Lifecycle Realization Rate			
	kWh	kW	therms	MMBtu	kWh	kW	therms	MMBtu
Freezer, Recycling and Replacement, Reduced Incentive	106%	106%	N/A	106%	106%	106%	N/A	106%
Freezer, Recycling and Replacement	106%	106%	N/A	106%	106%	106%	N/A	106%
Refrigerator, Recycling and Replacement, Reduced Incentive	95%	95%	N/A	95%	95%	95%	N/A	95%
Refrigerator, Recycling and Replacement	95%	95%	N/A	95%	95%	95%	N/A	95%
Total	**97%**	**97%**	N/A	**97%**	**97%**	**97%**	N/A	**97%**

Table 5 lists the *ex ante* and verified annual gross savings for the Program for CY 2019 by measure type.

Table 5. CY 2019 Appliance Recycling Program First-Year Gross Savings Summary

Measure	*Ex Ante* Gross First Year			Verified Gross First Year		
	kWh	kW	therms	kWh	kW	therms
Freezer, Recycling and Replacement, Reduced Incentive	1,750,144	216	0	1,850,255	228	0
Freezer, Recycling and Replacement	71,104	9	0	75,171	9	0
Refrigerator, Recycling and Replacement, Reduced Incentive	6,316,626	729	0	5,979,103	689	0
Refrigerator, Recycling and Replacement	302,682	35	0	286,508	33	0
Total First Year	**8,440,556**	**988**	**0**	**8,191,038**	**960**	**0**

Table 6 lists the *ex ante* and verified gross lifecycle savings by measure type for the Program in CY 2019.

Table 6. CY 2019 Appliance Recycling Program Lifecycle Gross Savings Summary

Measure	*Ex Ante* Gross Lifecycle			Verified Gross Lifecycle		
	kWh	kW	therms	kWh	kW	therms
Freezer, Recycling and Replacement, Reduced Incentive	17,501,440	216	0	18,502,552	228	0
Freezer, Recycling and Replacement	711,040	9	0	751,713	9	0
Refrigerator, Recycling and Replacement, Reduced Incentive	63,166,260	729	0	59,791,028	689	0
Refrigerator, Recycling and Replacement	3,026,820	35	0	2,865,085	33	0
Total Lifecycle	**84,405,560**	**988**	**0**	**81,910,377**	**960**	**0**

Evaluation of Net Savings

The Evaluation Team employed a decision-tree approach, described in the Uniform Methods Project (UMP),[4] to calculate and present net Program savings. The decision tree—populated by the CY 2019 survey findings and information gathered from interviewed market actors from other appliance recycling program evaluations—presents all of the Program's possible savings scenarios.

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

To calculate the net-to-gross (NTG) ratio, the Team used the following equation to combine all of the net impacts.

$$Net\ Savings\ (MWh\ per\ year) = Gross\ Savings - Freeridership\ \&\ Secondary\ Market\ Impacts$$

The Evaluation Team applied the measure-level NTG ratios to the appliance recycling measures, resulting in a Program-level NTG of 44%. Table 7 lists these results. A detailed description of the net savings analysis is presented in *Appendix I*.

Table 7. Appliance Recycling Program Final NTG Ratio by Appliance

Measure	Freeridership and Secondary Market Impacts	NTG Ratio	Sample Size
Refrigerator	0.58	0.42	149
Freezer	0.53	0.47	70
Program Total	**0.56**	**0.44**	**219**

[4] U.S. Department of Energy. September 2017. *Uniform Methods Project for Determining Energy Efficiency Program Savings for Specific Measures.* "Chapter 7: Refrigerator Recycling Evaluation Protocol." https://www.nrel.gov/docs/fy17osti/68563.pdf

Responses to the CY 2019 participant survey showed a decrease in the percentage of respondents who would have kept or transferred their appliance absent the Program. Table 8 compares these percentages in CY 2019 and CY 2017. Though the percentage of respondents who would have transferred a freezer rose in CY 2019, this did not offset the drop in the percentage of participants who would have kept their freezer.

Table 8. Respondent Actions Absent the Program

Measure	Participant Would Have Kept Their Appliance		Participant Would have Transferred Their Appliance	
	CY 2017	CY 2019	CY 2017	CY 2019
Refrigerator	39%	35%	18%	12%
Freezer	59%	40%	9%	15%

The decrease in NTG from 2017 is likely the result of lower Program incentives in CY 2019. Program savings occur when appliances are removed from the grid that would have continued to operate in absence of the Program. Lower incentives are less likely to encourage customers who place value on their appliance to recycle their appliance through the Program.

Table 9 shows the Program's annual net demand and energy impacts (kWh, kW, and therms) by measure category. The Evaluation Team attributed these savings as net of what would have occurred naturally without the presence of the Program.

Table 9. Appliance Recycling Program Annual Net Savings

Measure	First-Year Net		
	kWh	kW	therms
Freezer	904,950	112	0
Refrigerator	2,655,473	306	0
Total First Year	**3,560,424**	**418**	**0**

Table 10 lists the Program's lifecycle net demand and energy impacts (kWh, kW, and therms) by measure category.

Table 10. Appliance Recycling Program Lifecycle Net Savings

Measure	Lifecycle Net		
	kWh	kW	therms
Freezer	9,049,505	112	0
Refrigerator	26,554,731	306	0
Total Lifecycle	**35,604,236**	**418**	**0**

Process Evaluation

The Evaluation Team focused the process evaluation on the following key topics:

- Customer satisfaction and experience
- Customers' awareness and perception of Focus on Energy
- Drivers of participation
- Program design, delivery, and coordination among the Program Administrator, Program Implementer, and utility partners
- Opportunities to streamline Program delivery

Program Design, Delivery, and Goals

The Evaluation Team interviewed key Program Administrator staff to obtain an overview of the Program's design and delivery processes and to identify any associated changes or challenges. The Program Implementer operated the CY 2019 Program as designed with no significant changes from CY 2018 other than a reduction in the amount of the incentive rebate.

According to the Program Administrator, the CY 2019 Program ran smoothly with few customer issues or complaints. The Program Administrator reported receiving positive feedback from customers regarding the Program's pick-up crews. This is consistent with improved ratings for Program staff from survey respondents (see *Annual Results from Ongoing Participant Satisfaction Survey* section). The Program Implementer has continued to show incremental improvements in customer service since subcontracting pick-up trucks and crews in CY 2017. These crews provide coverage statewide and reduce average pick-up times (see *Scheduling and Check Payment Cycle Times* section). The Program Administrator reported having a positive working relationship with the Program Implementer and frequent contact among staff members.

The Program Administrator said its data systems have been operating effectively with the Program Implementer's data systems. Though internal forecasts and reports have sometimes been delayed due to database issues, these issues do not affect the customer experience.

Program Changes

The most significant change to the CY 2019 program was lowering the incentive rebate to $20 per unit from $35 in CY 2018. The Program Administrator said this change was justified by previous research that showed that most participants would still have recycled a unit with a lower incentive. Otherwise, the Program Administrator said the Appliance Recycling Program has followed the same implementation model with the same Program Implementer and subcontractors as the previous year.[5]

[5] In CY 2019, Focus on Energy subcontracted with Verdant to handle digital marketing for the entire portfolio.

Program Management and Delivery Structure

In CY 2019, the Program Administrator was responsible for general management, submitting monthly reports to the PSC, and overseeing marketing. The Program Implementer oversaw all aspects of Program delivery, including appliance pick-up and recycling, producing and distributing marketing materials, managing the call center and online scheduler, and reporting data.

Toward the end of CY 2017, the Program Implementer hired a subcontractor to provide trucks and pick-up crews, which improved scheduling and logistics by distributing more drivers and dispatch points around the state. Two full years after this key change in Program delivery, waiting periods between scheduling and actual pick-up have been reduced to an average of 11.8 days in CY 2019 from 16.5 days in CY 2017.

Program Goals

In CY 2019, participants recycled 10,124 appliances through the Appliance Recycling Program. This represented a 24% decline from CY 2018, when the Program recycled 13,305 appliances.

The Program's overall objective is to encourage customers to recycle inefficient appliances. For CY 2019, Focus on Energy set the following savings goals:[6]

- Demand reduction of 1,326 kW
- Lifecycle electric savings of 113,968,600 kWh

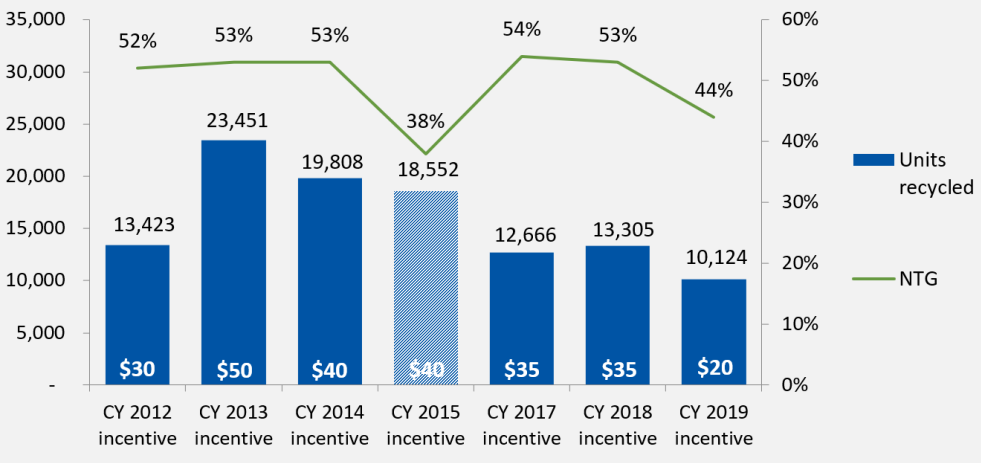
The Program did not meet its electric savings and demand goals in CY 2019 due to lower participation than expected.

Incentive levels have historically played a major role in the achievement of Program goals, as demonstrated by the relationship between incentive levels and recycled units over the last five years. Figure 3 shows a consistent pattern of recycling more units when incentives were higher and fewer when incentives were lower.

In CY 2019, there was also a decrease in NTG corresponding to the decrease in incentive levels. The only previous year with a low NTG was CY 2015, which was the year the Program's previous implementer went out of business. This decrease in NTG during a single year may not be indicative of a trend, but the Evaluation Team will continue to monitor this metric in CY 2020 when the Program incentive is discontinued.

[6] Metrics presented in this section represent Focus on Energy's targets for the Program and not contractual goals for the Program Implementer. The Program Implementer is required to meet a gross lifecycle MMBtu goal in addition to fuel-specific savings targets.

Figure 3. Appliance Recycling Program Annual Goals, Units Recycled, and Incentive Levels



The bar for CY 2015 is shaded to indicate that the Program was suspended during this year.
CY 2016 is not shown because the Program was not available that year.
Following the UMP, CY 2012-CY 2015 NTG analysis included an induced replacement factor. The Evaluation Team stopped applying the factor in CY 2017 when it was removed from the UMP protocols. If CY 2017-CY 2019 NTG analysis included induced replacement factors, NTG ratios would be about 5% less.
Source: SPECTRUM database and previous Program evaluations.

When the Appliance Recycling Program was relaunched in CY 2017, the Program Administrator established a lower incentive amount and lower unit goal in part out of concern that pent-up demand from the suspension could outpace the available incentive budget before December. In CY 2018, the Program offered the same incentives as in CY 2017, and participation remained relatively stable from the previous year. When the incentive was reduced in CY 2019, the number of units recycled fell by 24%, though other factors such as the level of marketing effort likely contributed to this decline.

Marketing and Outreach

The Program Implementer produced marketing materials for the Program, which convey Focus on Energy branding and are sometimes co-branded with participating utilities. The Program Implementer also purchased media for advertising. On some occasions, the Program Administrator and Program Implementer combined advertising budgets to achieve lower bulk rates. The Program Implementer also tracked the effectiveness of advertising and shifted funds to better-performing channels as needed.

The Program Administrator maintained the Focus on Energy website with content provided by the Program Implementer. In CY 2019, the Program Administrator routed digital advertising through the new subcontractor, Verdant. The Program Administrator reported that in CY 2019, the Program Implementer did not make any other significant changes to the marketing channels and messaging used to promote the Program in CY 2017 and CY 2018.

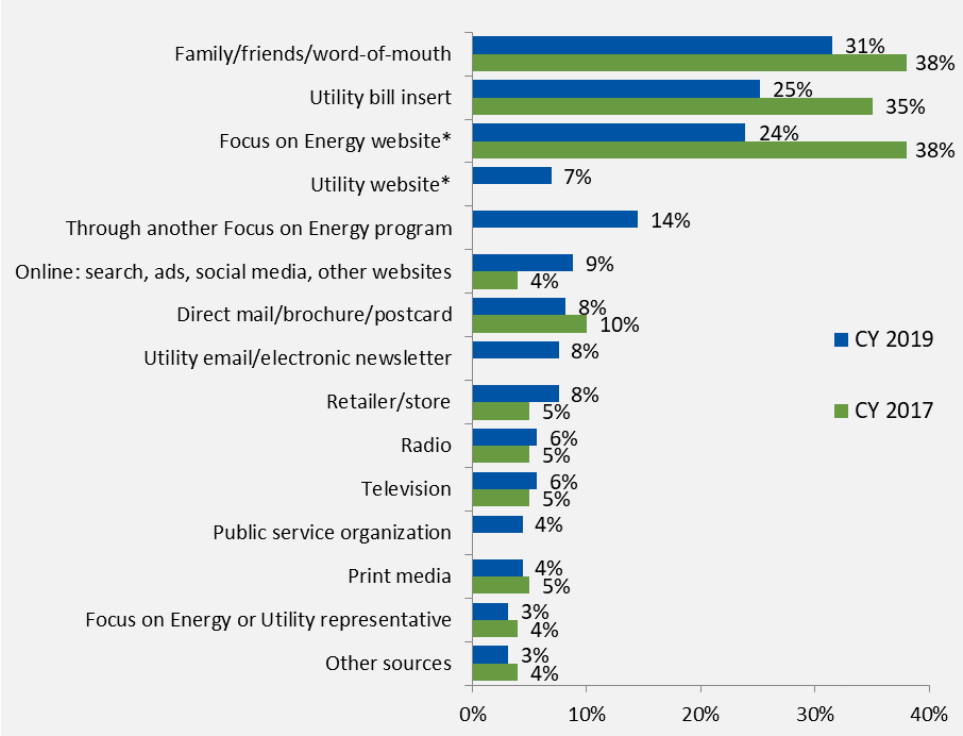
Program Awareness

The Evaluation Team surveyed 170 Program participants—100 who recycled a refrigerator and 70 who recycled a freezer—to gain a better understanding of the Program's marketing effectiveness and reach.

Survey results show that bill inserts remain an effective outreach method in CY 2019 as in past evaluations, with a quarter or more of respondents who said they learned about the Program through bill inserts in CY 2017, CY 2015, and CY 2013. Word-of-mouth (31%) and the Focus on Energy website (24%) were also common sources of awareness in CY 2019, as in CY 2017. Significantly more CY 2019 participants mentioned online search and advertising (9%, up from 4%) and participation in other Focus on Energy programs (14%, up from 0%), compared to CY 2017.[7]

Figure 4 shows sources of Program awareness in CY 2019 and CY 2017.

Figure 4. Customer Source of Awareness of Program



* The CY 2019 survey recorded Focus on Energy and utility websites separately, but the CY 2017 survey combined these responses (shown together as 38% Focus on Energy website for CY 2017).

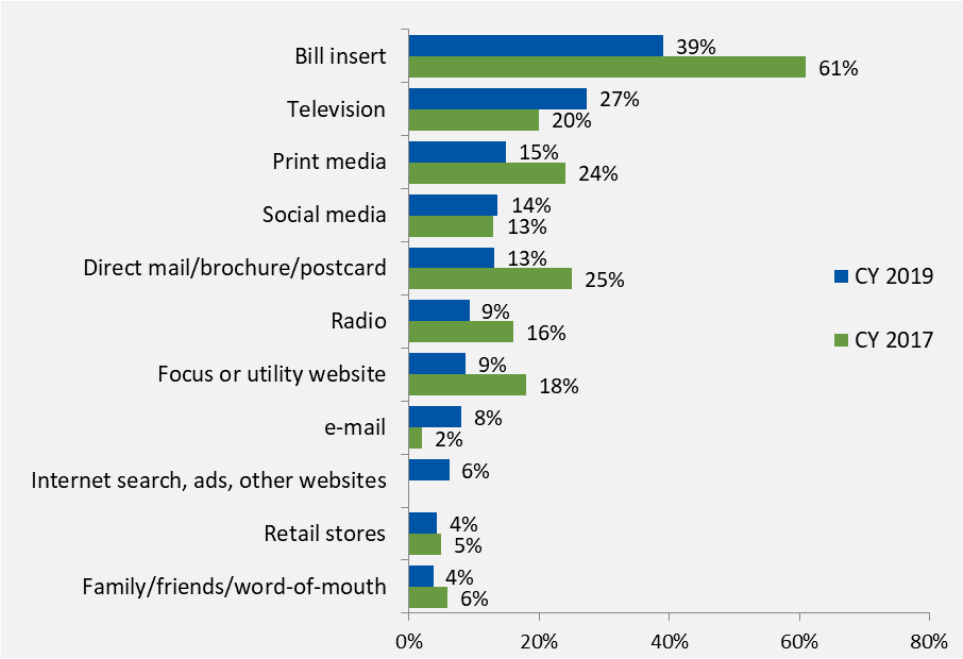
Source: 2019 Residential Appliance Recycling Program Participant Survey. Question B1: "Where did you most recently learn about Focus on Energy's Appliance Recycling Program?" and Question B2: "Are there any other ways you heard about the Program?" (n=159). 2017 Residential Appliance Recycling Program Participant Survey. Question B1: "Where did you MOST RECENTLY learn about Focus on Energy's appliance pick-up and recycling program?" and Identical Question B2 (n=165).
Responses total to more than 100% because multiple responses were allowed.

[7] Results using binomial t-tests: p=0.078 (online search and advertising), p=0.000 (participation in other programs). In the CY 2017 survey, none of the respondents reported learning about the Program through participation in other Focus on Energy programs, though 6% mentioned previous experience with the Appliance Recycling Program.

As shown in Figure 5, survey respondents in CY 2019 were less likely to mention bill inserts (39%), print media (15%), and direct mail (13%) as preferred sources for program information compared to CY 2017, although bill inserts were still the preference for the largest number of CY 2019 participants.

Most potential sources of information received fewer mentions than CY 2017, indicating that respondents tended to choose fewer options than during the previous survey. Two information sources that were mentioned significantly more often in CY 2019 were emails (8%, up from 2%) and internet search and advertising (6%, not enough responses to report separately in previous years).[8] However, preference for learning about programs from Focus on Energy or utility websites declined significantly from 18% in CY 2017 to 9% in CY 2019.[9]

Figure 5. Best Methods for Contacting Customers



Source: 2019 Residential Appliance Recycling Program Participant Survey. Question B7: "What do you think is the best way for Focus on Energy to inform the public about energy efficiency programs?" (n=161); Identical Question B7 from 2017 Residential Appliance Recycling Program Participant Survey (n=161). Responses total to more than 100% because multiple responses were allowed.

Awareness by Age Group

The Evaluation Team analyzed the relationship between participants' ages and how they heard about the Program and how they preferred to receive communications about programs. Table 11 shows the age distribution of survey respondents in this analysis. Most respondents (80%) were age 45 or older.

[8] Results using binomial t-tests: p=0.012 (email), p=0.001 (internet search and advertising).

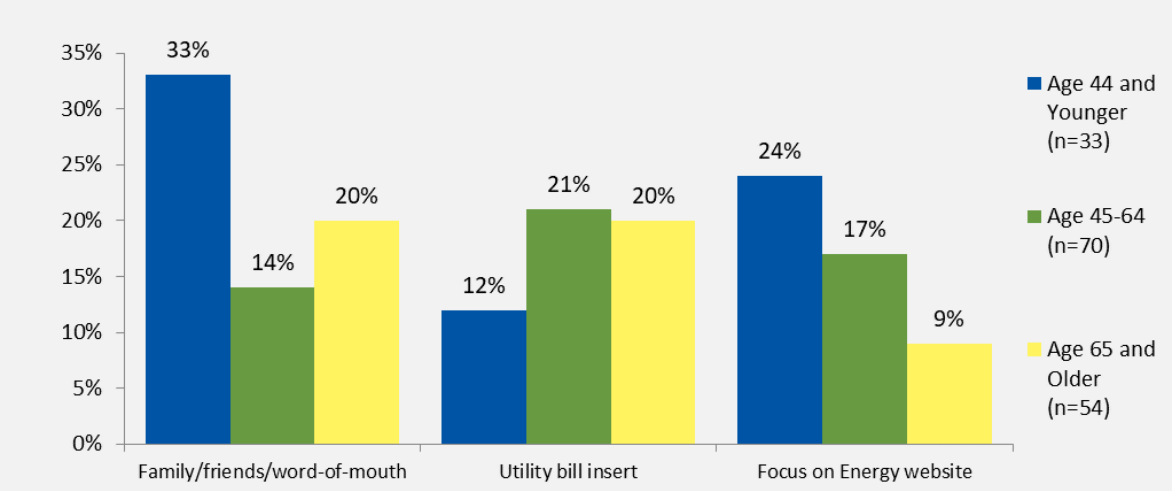
[9] p=0.014 using binomial t-test.

Table 11. Age Distribution

	Appliance Recycling Program Participant Survey Respondents (n=167)
Age 18-44	20%
Age 45-64	45%
Age 65 and older	35%

Figure 6 shows the top three sources of Program awareness by three age groups: 44 and younger, 45 to 64, and 65 and older. The youngest participants were most likely to hear about the Program through word-of-mouth (33%) or the Focus on Energy website (24%). Participants aged 45 to 64 reported nearly equal awareness from word-of-mouth (14%), bill inserts (21%), and the Focus on Energy website (17%). Participants over 65 were more likely to hear about the Program through word-of-mouth or bill inserts (20% each), compared to the Focus on Energy website (9%).

Figure 6. Most Recent Source of Program Awareness by Age Group

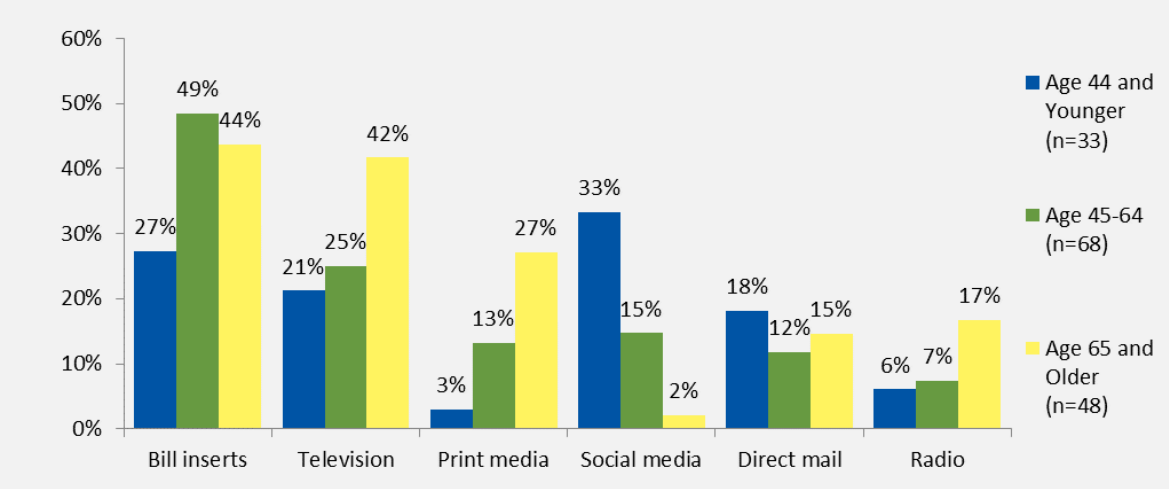


Source: 2019 Residential Appliance Recycling Program Participant Survey. Question B1: "Where did you most recently hear about the Focus on Energy's Appliance Recycling Program?" (n=157)

Figure 7 shows the six preferred sources of program information that were mentioned most frequently by age group. Bill inserts were much more popular with participants age 45 and older (47%) than those age 44 and younger (27%), corresponding to the difference between these age groups in terms of how they most recently heard about the Program (Figure 6, above). Participants age 65 and older mentioned television (42%), print media (27%), and radio (17%) much more frequently than the other age groups.

Print media was mentioned very rarely by participants age 44 and younger (2%). Preference for communications through social media showed the opposite pattern, being the most popular source of information for the youngest age group (33%) but rarely mentioned by the oldest (2%). Despite a strong skew towards older participants, television was still the second most mentioned source for participants age 45 to 64 (25%) and third most mentioned for participants age 44 and younger (21%).

Figure 7. Preferred Communication Sources by Age Group



Source: 2019 Residential Appliance Recycling Program Participant Survey. Question B7: "What do you think is the best way for Focus on Energy to inform the public about energy efficiency programs?" (n=149). Responses total to more than 100% because multiple responses were allowed.

Participation and Awareness of Other Focus on Energy Programs

The Evaluation Team asked participants about their awareness of and participation in other Focus on Energy programs. The results are shown in Figure 8.

The percentage of Appliance Recycling Program participants who participated in the Simple Energy Efficiency Program doubled from 9% in CY 2017 to 18% in CY 2019.[10] There was also substantial crossover participation (10%) and awareness (19%) with Home Performance with ENERGY STAR. Awareness of and participation in the Residential Lighting and Appliance Program decreased significantly from CY 2017 but were still higher than awareness and participation in CY 2015.[11] Few Appliance Recycling Program participants were aware of Renewable Rewards (4%), New Homes (2%), and the Online Store (1%).

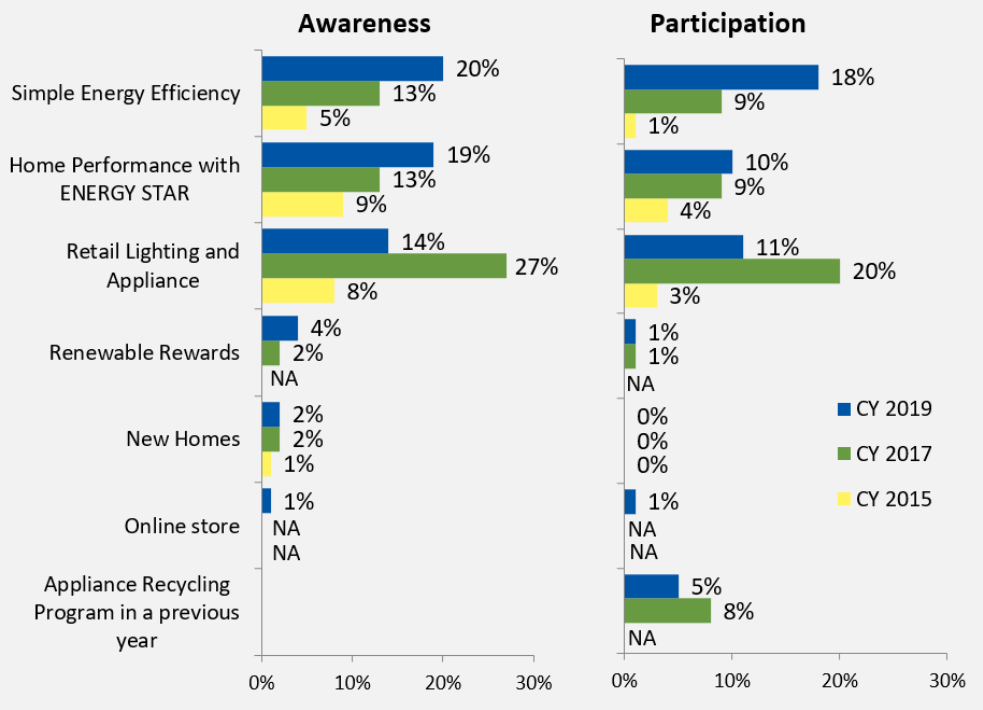
In CY 2019, 48% of survey respondents said they were aware of at least one other Focus on Energy program (compared to 45% in CY 2017). Of these, 83% had previously participated in a program (compared to 78% in CY 2017).

Overall, 40% of surveyed CY 2019 Appliance Recycling Program participants said they had participated in another Focus program, up slightly from 35% in CY 2017.

[10] p=0.015 using binomial t-test.

[11] Results using binomial t-tests (CY 2019 compared to CY 2017): p=0.003 (awareness), p=0.021 (participation).

Figure 8. Customer Awareness and Participation in Other Focus on Energy Programs



Source: CY 2019 Appliance Recycling Program Participant Survey. Question B4: "Which programs or rebates are you aware of?" and Question B6: "Which programs have you participated in?" (n=170); CY 2017 Appliance Recycling Program Participant Survey. Question B4: "Which programs, rebates or projects [are you aware of]?" and Question B6: "Which programs, rebates or projects [have you participated in]?" (n=170); CY 2015 Appliance Recycling Program Participant Survey. Identical Questions B4 and B6 (n=170).

Scheduling and Check Payment Cycle Times

The Evaluation Team analyzed scheduling and check payment cycle times from SPECTRUM, supplemental Program data from the Program Implementer, and satisfaction surveys with 1,567 participants. The Team measured cycle times for scheduling (number of days from Program enrollment to unit pick-up) and check payment (number of days from unit pick-up to check mailing, that is, days an incentive is outstanding). Results of both cycle times are shown in Table 12.

Table 12. Scheduling and Check Payment Cycle Times

Period	Scheduling Cycle Time[a]			Check Payment Cycle Time[b]		
	Valid Count	Average in Days	% 21 Days or More	Valid Count	Average in Days	% 30 Days or More
Q1	628	10.7	8%	628	36.5	86%
Q2	2,170	11.5	10%	2,170	33.9	63%
Q3	3,123	11.8	16%	3,123	34.5	67%
Q4	3,711	10.2	10%	3,711	38.9	74%
CY 2019 Total	**9,632**	**11.0**	**12%**	**9,632**	**36.2**	**70%**

[a] Scheduling cycle time is the difference in number of days between the Schedule/Enrollment Date and the Pick-Up Date in supplemental Program Implementer data.

[b] Check payment cycle time is the difference in the number of days between the Pick-Up Date in supplemental Program Implementer data and the Status Changed To Paid Date in SPECTRUM.

In CY 2019, the average scheduling cycle was 11.0 days, and only 12% of participants waited 21 days or more for unit pick-up. This was a dramatic improvement from an average wait time of 19.5 days in CY 2018, with 31% waiting more than 21 days for pick-up. This cycle consistently averaged between 10 days and 12 days for every quarter in CY 2019.

Check payment cycles were consistent between quarters in CY 2019, with averages ranging from 34 to 39 days by quarter. Overall, the average check cycle for CY 2019 was 36 days, similar to CY 2018 (32 days) and CY 2017 (34 days). More than two-thirds of CY 2019 participants (70%) waited longer than the portfolio goal of 30 days for check payment.

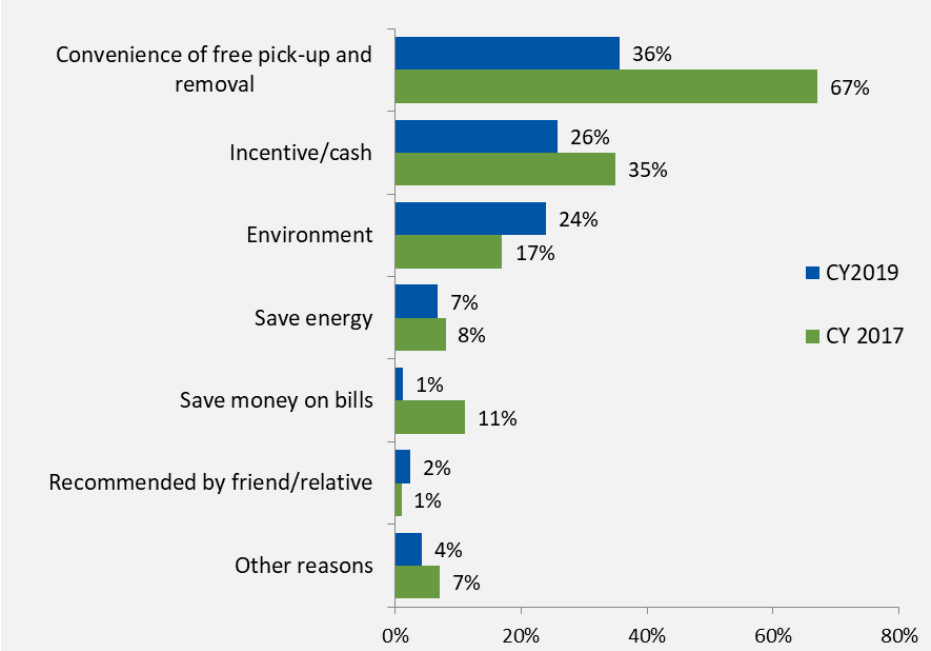
Customer Experience

The Evaluation Team conducted two surveys with Appliance Recycling Program participants in CY 2019. The telephone survey included a question about participants' motivation for recycling their appliances. The satisfaction survey asked participants about their satisfaction, impressions of their utility, and suggestions for improving the Program.

Motivation for Participation

Figure 9 shows that, as in 2017, CY 2019 participants most frequently mentioned the convenience of free pick-up and removal (36%) as motivation for recycling appliances through the Program. Other motivations were environmental concerns (26%) and the incentive (24%). These two motivations differ from CY 2017 when environmental concern was 17% and the incentive was 35%. The CY 2019 survey recorded only one reason per respondent for this question, while the CY 2017 survey recorded all reasons mentioned without ranking them. With this change in the survey question, saving money on bills fell from 11% (of all reasons mentioned) to 1% (most important reason), indicating this is usually a secondary motivation.

Figure 9. Customer Motivation for Participating in the Program



Note: The CY 2017 survey allowed respondents to choose more than one motivation (responses total to more than 100%), but the CY 2019 survey only allowed a single response.
Source: CY 2019 Appliance Recycling Program Participant Survey. Question B4: "What motivated you to participate in the Program?" (n=163); CY 2017 Appliance Recycling Program Participant Survey. Question B8: "What motivated you to participate in Focus on Energy's Appliance Recycling Program?" (n=168).

Annual Results from Ongoing Participant Satisfaction Survey

Throughout CY 2019, the Evaluation Team surveyed Program participants to measure their satisfaction with various aspects of the Program. Respondents answered satisfaction and likelihood questions on a scale of 0 to 10, where 10 indicates the highest satisfaction or likelihood and 0 the lowest.[12]

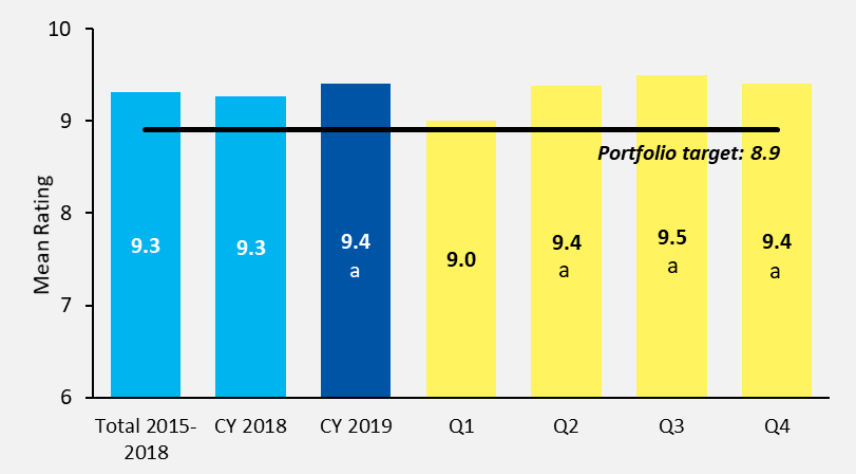
As shown in Figure 10, the average overall Appliance Recycling Program satisfaction rating among CY 2019 participants was 9.4, representing a significant increase from the average rating from CY 2018 participants (9.3). This Program's satisfaction rating was significantly higher than the portfolio target of 8.9 for CY 2019 and for the last three quarters of CY 2019.[13] Appliance Recycling Program participants gave this Program (and the Simple Energy Efficiency Program) the highest satisfaction ratings of any

[12] The number of participants who completed a survey does not always match the number of responses for each question, as some participants skipped questions, did not know answers to questions, or did not qualify to answer questions based on previous answers or other known data about the participant.

[13] The Program Administrator's contract established a portfolio target of 8.9 to maintain or increase customer satisfaction. The Evaluation Team found that some surveys did not include identifying information to match survey responses to Program participation dates. The Team included survey responses without participation dates in the year-end total but not in the quarterly breakdown.

Focus on Energy residential programs in CY 2019. The Appliance Recycling Program was also the highest-rated residential program in CY 2018 and over the previous quadrennium (CY 2015-CY 2018).

Figure 10. CY 2019 Overall Program Satisfaction



[a] This result is statistically significantly different from the portfolio target (p<0.10 or better using binomial t-tests).

Source: Appliance Recycling Program Ongoing Participant Satisfaction Survey Question. "Overall, how satisfied are you with the Focus on Energy Program?" (CY 2018 n=1,567, CY 2019 n=1,561, Q1 n=141, Q2 n=356, Q3 n=442, Q4 n=486) Total CY 2015–CY 2018 is the participation-weighted average of three annual results (the Appliance Recycling Program was suspended in CY 2016).

Table 13 shows the average satisfaction and likelihood ratings for CY 2019 and CY 2018. In CY 2019, ratings for satisfaction with program staff (9.4) and likelihood to recommend the Program (9.6) showed significant increases from the previous year (9.2 and 9.5, respectively). Participant ratings for their likelihood of making more energy-saving improvements (6.4) showed a significant decrease from CY 2018 (6.6).

Table 13. CY 2019 Average Ratings for Appliance Recycling Program

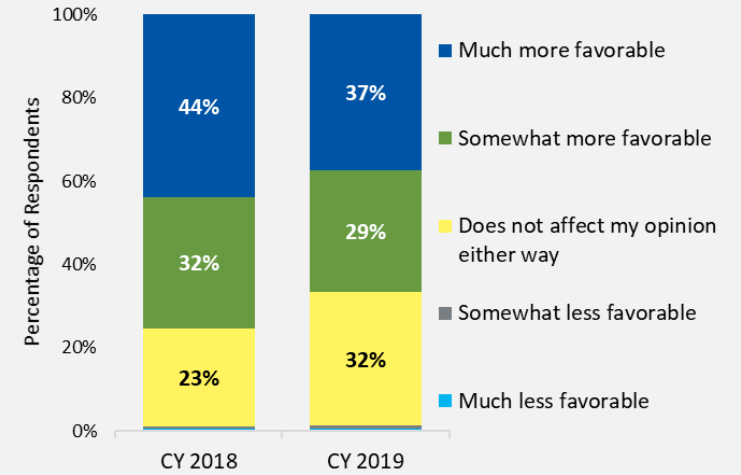
Item	CY 2018	CY 2019
Satisfaction with Program staff	9.2	9.4 [a]
Likelihood of making more improvements	6.6	6.4 [a]
Likelihood of recommending the Program	9.5	9.6 [a]

[a] This result is statistically significantly different from the result for CY 2018 (p<0.10 using a binomial t-test).

Using these survey data, the Evaluation Team calculated a Net Promoter Score (NPS) based on customers' likelihood to recommend the Program. The NPS is expressed as an absolute number between -100 and +100 that represents the difference between the percentage of promoters (respondents giving a rating of 9 or 10) and the percentage of detractors (respondents giving a rating of 0 to 6). The NPS for CY 2019 participants was +90, an improvement from +84 NPS in CY 2018 and CY 2017. The Appliance Recycling Program NPS was the highest in the residential portfolio for CY 2019.

CY 2019 Program participants were asked if Focus on Energy offerings affected their opinion of their utilities, and 37% gave the highest rating of *much more favorable* (Figure 11). Just 32% said that their opinion was not affected, and only 1% survey respondents (21 out of 1,457) reported that their opinion of their utility had become *somewhat less favorable* or *much less favorable*. However, significantly fewer CY 2019 respondents gave *much more favorable* ratings compared to CY 2018 (44%).[14]

Figure 11. CY 2019 Effect of Focus on Energy Offerings on Opinion of Utilities



Source: Appliance Recycling Program Ongoing Participant Satisfaction Survey Question.
"How have these offerings affected your opinion of your utility, if at all?" (CY 2019 n=1,457)

Program participants were asked to identify the factors that have the most influence on their purchase decisions (Figure 12). The most frequent response was product reviews from customers (53%) followed by deep discounts (30%) and new or innovative product and features (26%).

The customer satisfaction survey respondents also provided comments or suggestions for improving the Program. Of the 1,567 participants who responded to the survey, 30% provided open-ended feedback, which the Evaluation Team coded into a total of 594 mentions. Of these mentions, 370 were positive or complimentary comments (62%) and 224 were suggestions for improvement (38%).

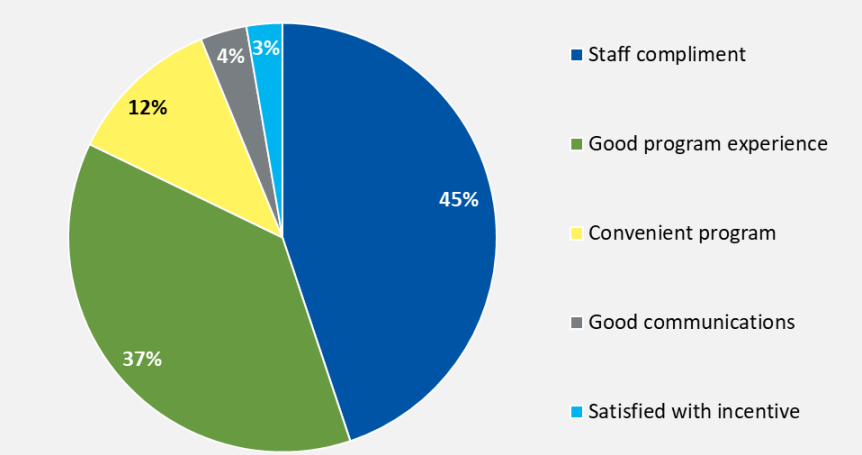
[14] Results using binomial t-test: p=0.001.

Figure 12. CY 2019 Most Valued Factors in Purchase Decisions

Source: Appliance Recycling Program Ongoing Participant Satisfaction Survey Question. "What most influences your decision to make a purchase (energy efficiency or otherwise)?" (CY 2019 n=1,485). Responses total more than 100% because multiple responses were allowed.

The positive responses are shown in Figure 13, with 45% complimenting the Program staff and pick-up crew. This represented a substantial increase in staff compliments, which were only 26% of positive comments in CY 2018, and corresponds with the significant increase in satisfaction for program staff in CY 2019. The other notable change was that in CY 2019 only 3% of these comments indicated satisfaction with the incentive amount, down from 7% in CY 2018 (corresponding to the decrease in the incentive amount from $35 to $20).

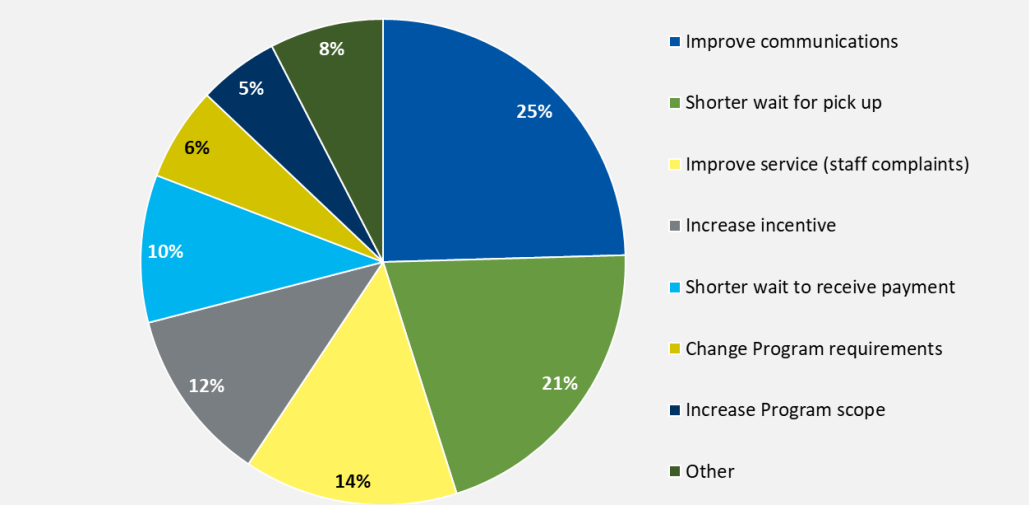
Figure 13. CY 2019 Positive Comments about the Program



Source: Appliance Recycling Program Ongoing Participant Satisfaction Survey Question. "Please tell us more about your experience and any suggestions." (CY 2019 total positive mentions n=370)

Participants' suggestions for improvement are shown in Figure 14. In CY 2019, the most frequent customer suggestions involved improving communications (25%), reducing the wait for pick-up (21%), improving service from Program staff (14%), and increasing the incentive (12%).

Figure 14. CY 2019 Suggestions for Improving the Program



Source: Appliance Recycling Program Ongoing Participant Satisfaction Survey Question. "Please tell us more about your experience and any suggestions." (CY 2019 total suggestions for improvement mentions n=224)

Changes in the character of suggestions from CY 2018 were related mainly to the Program's reduced incentive in CY 2019. More comments from CY 2019 participants suggested increasing incentives (12%, up from 5% of suggestions in CY 2018), and the increase in comments about improving communications (25%, up from 15% in CY 2018) was largely driven by confusion over the change to incentive amounts (that is, some customers had received communications stating the incentive was $35 and were disappointed to receive $20). Suggestions to improve customer service also fell by more than half (14%, down from 32% in CY 2018), corresponding to the significant increase in satisfaction ratings for Program staff (see Table 13 above).

Reducing wait times for pick-up and check payment were two categories of suggestion mentioned at equivalent rates in CY 2019 and CY 2018, despite a significant improvement in reducing the average days to schedule pick-up (see Table 12 above).

In addition to comments relating to confusion over the incentive amount, suggestions for improving communications tended to focus on three areas:

- Not receiving a call to confirm an appointment time
- Too many confirmation calls from the automated calling system
- Lack of promotion and awareness of the Appliance Recycling Program

A smaller number of suggestions about communication reflected a desire for more clear and accurate information about Program requirements, such as the acceptable condition of units for pick-up and whether somebody needed to be at home to meet the pick-up crew.

Program Cost-Effectiveness

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

Table 14 lists the CY 2019 incentive costs for the Appliance Recycling Program.

Table 14. Appliance Recycling Program Incentive Costs

	CY 2019
Incentive Costs	$218,725

The Evaluation Team found that the CY 2019 Appliance Recycling Program was cost-effective (1.31). Table 15 lists the evaluated costs and benefits.

Table 15. Appliance Recycling Program Costs and Benefits

Cost and Benefit Category	CY 2019
Costs	
Administration Costs	$0
Delivery Costs	$1,119,630
Incremental Measure Costs	$506,893
Total Non-Incentive Costs	**$1,626,523**
Benefits	
Electric Benefits (kWh)	$1,134,851
Electric Benefits (kW)	$511,083
Gas Benefits	$0
Emissions Benefits	$486,949
Total TRC Benefits	**$2,132,884**
Net TRC Benefits	**$506,360**
TRC B/C Ratio	**1.31**

Evaluation Outcomes and Recommendations

The Evaluation Team identified the following outcomes and recommendations for the Appliance Recycling Program.

Outcome 1. Improving communications was the most common suggestion for improvement from participants this year. Suggestions to improve communications increased from 15% of comments in CY 2017 to 25% in CY 2019. The driver of this increase was customer confusion over the rebate change from $35 to $20: several customers expected to receive the higher incentive amount the Program offered in previous years.

Recommendation 1. To manage customer expectations in CY 2020 when the Program discontinues Appliance Recycling Program incentives, the Evaluation Team recommends that communications with customers who enroll in the Program explicitly mention that participation in the Program does not

include an incentive. Customers may recall advertising from prior years and expect to receive an incentive if this is not called out.

Outcome 2. Older customers prefer traditional media sources like television, print, and radio. Though bill inserts were the most preferred method of communications about programs for customers age 45 to 64 (49%) and 65 and older (44%), television was the second most frequently mentioned channel for these groups (25% 45 to 64, 42% 65 and older). The next most popular sources for customers age 65 and up were print media (27%) and radio (17%). In contrast, customers under age 45 preferred to learn about programs from social media (33%) more than any other sources. The majority of Program participants are age 45 and older (80%).

Recommendation 2. The Team recommends that the Program consider advertising in local newspaper and radio to target older customers who make up the bulk of Appliance Recycling Program participants. These advertising channels are also targeted to narrow geographic areas and are not as expensive as television.

Home Performance with ENERGY STAR Program

The Home Performance with ENERGY STAR® Program encourages comprehensive energy efficiency retrofits in single-family homes with three or fewer units. Focus on Energy designed the Program to address customers' uncertainty about home improvements, possible costs, and potential energy savings by providing information and recommendations specific to each customer's home.

APTIM is the Program Administrator. CLEAResult is the Program Implementer.

The Program offered three participation paths in CY 2019:

- Whole Home path for building shell improvements
- HVAC path for heating and cooling improvements
- Renewable Energy path, available to residential and small business customers
- Includes a Rural Renewables bonus for residential customers in designated rural zip codes

The Whole Home and HVAC paths offer two incentive tiers for energy efficiency improvements:

- Tier 1, the standard track, offers incentives to all homeowners.
- Tier 2, the income-qualified track (IQT), offers enhanced incentives to homeowners with a household income at or below 80% of the state median income.

As part of the PSC's initiative to enhance Focus on Energy services to rural customers, the Home Performance Program offers a $2,000 Rural Renewables bonus to residential customers who installed a solar photovoltaic (PV) system through the Renewable Energy path in designated rural zip codes.[15]

In 2018, the PSC approved Focus on Energy's plan to provide relief to central and southern Wisconsin residential customers whose mechanical systems were destroyed in the August 2018 flooding.[16] The plan increased standard (Tier 1) HVAC incentives by 100% for equipment installed between August 17, 2018, and March 1, 2019.

In CY 2019, Focus on Energy also began offering training and resources to real estate professionals—as Real Estate Ambassadors—to help them educate home buyers about energy efficiency and the benefits of participating in the Home Performance Program.[17] This effort builds on the Home Energy Score

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[15] Focus on Energy designated rural zip codes according to U.S. Census Bureau data.

[16] Customers of these counties were eligible for increased flood relief incentives: Adams, Columbia, Dodge, Green Lake, Jefferson, Marquette, Ozaukee, Monroe, Fond du Lac, Juneau, La Crosse, Vernon, Dane, Richland, Crawford, and Sauk.

[17] In CY 2019, Focus on Energy began offering resources to real estate professionals—Real Estate Ambassadors—on its website. https://focusonenergy.com/ambassador/resources

initiative developed by the U.S. Department of Energy and was implemented as part of the Home Performance Program in CY 2018.[18]

This chapter provides aggregated and independent findings for all Program components and incentive tiers. Table 16 lists actual Program spending, savings, participation, and cost-effectiveness for the Whole Home and HVAC paths in CY 2019. These totals include Flood Relief projects, which comprised 279 participants and 285 units that would normally fall mostly under the HVAC path.

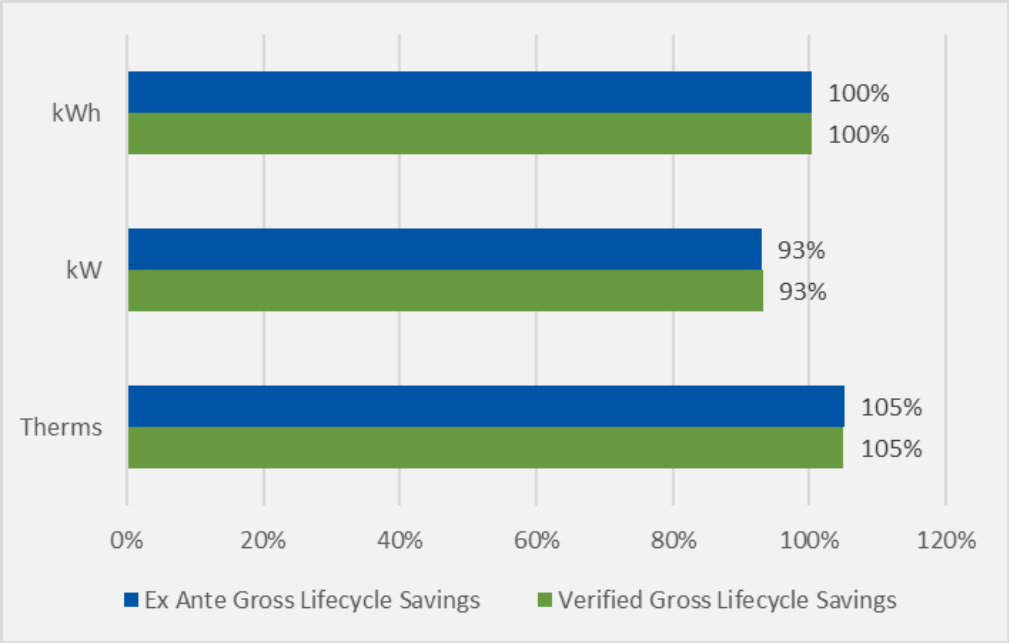
Table 16. Home Performance with ENERGY STAR Program Summary, Whole Home and HVAC Paths

Item	Units	CY 2018	CY 2019
Incentive Spending	$	$6,655,875	$8,955,491
Participation	Number of Participants	24,464	25,777
Verified Gross Lifecycle Savings	kWh	214,518,586	277,193,100
	kW	3,328	2,850
	therms	30,784,872	28,022,854
Verified Gross Lifecycle Realization Rate	% (MMBtu)	100%	100%
Annual NTG Ratio	% (MMBtu)	78%	84%
Net Annual Savings	kWh/year	9,869,621	12,855,340
	kW	2,639	2,344
	therms/year	1,453,499	1,308,724
Net Lifecycle Savings	MMBtu	3,712,504	3,195,039
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	1.14	0.97

Figure 15 shows the percentage of gross lifecycle savings goals achieved by the Whole Home and HVAC paths in CY 2019. The Program met or exceeded its electric energy and natural gas savings goals but did not achieve its demand reduction goal.

[18] More information is available on the website. U.S. Department of Energy. Better Buildings. "Home Energy Score." https://betterbuildingssolutioncenter.energy.gov/home-energy-score/

Figure 15. Home Performance with ENERGY STAR, Whole Home and HVAC Paths Achievement of CY 2019 Gross Lifecycle Savings Goals



The 100% *ex ante* gross lifecycle savings reflects the Program Implementer's contract goals for CY 2019. Verified gross lifecycle savings contribute to the Program Administrator's portfolio-level goals.

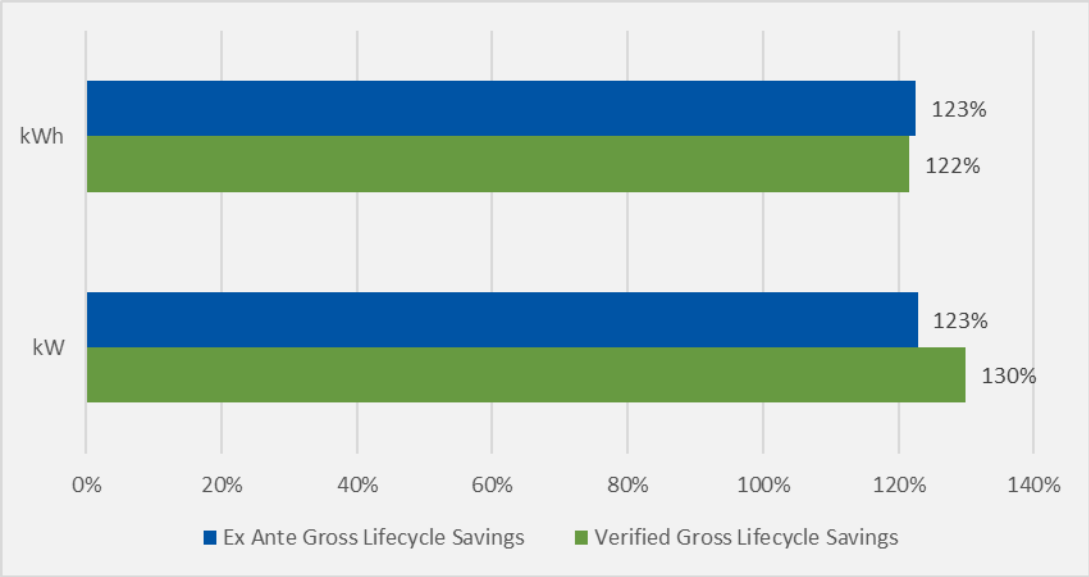
Table 17 lists actual Program spending, savings, participation, and cost-effectiveness for the Renewable Energy path in CY 2019. Incentives in this table include incentives for the core Renewable Energy path and $199,981 in Rural Renewables bonuses. All savings are attributable to the core Renewable Energy path.

Table 17. Home Performance with ENERGY STAR Program Summary, Renewable Energy Path

Item	Units	CY 2018	CY 2019
Incentive Spending	$	$1,766,638	$1,423,379
Participation	Number of Participants	819	902
Verified Gross Lifecycle Savings	kWh	285,473,328	251,104,351
	kW	3,978	3,561
	therms	0	0
Verified Gross Lifecycle Realization Rate	% (MMBtu)	100%	99%
Annual NTG Ratio	% (MMBtu)	72%	59%
Net Annual Savings	kWh/year	8,294,897	6,057,086
	kW	2,875	2,126
	therms/year	0	0
Net Lifecycle Savings	MMBtu	703,766	511,452
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	1.14	1.17

Figure 16 shows the percentage of gross lifecycle savings goals achieved by the Renewable Energy path in CY 2019. Program goals reflect anticipated participation in both the core Renewable Energy path and the Rural Renewables bonus. The Program exceeded its electric savings goals.

Figure 16. Home Performance with ENERGY STAR, Renewable Energy Path Achievement of CY 2019 Gross Lifecycle Savings Goals



The 100% *ex ante* gross lifecycle savings reflects the Program Implementer's contract goals for CY 2019. Verified gross lifecycle savings contribute to the Program Administrator's portfolio-level goals.

Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted impact and process evaluations of the Home Performance Program in CY 2019. The Team designed its evaluation, measurement and verification approach to integrate multiple perspectives in assessing Program performance. Table 18 lists specific data collection activities and sample sizes used in the evaluations.

Table 18. CY 2019 Home Performance with ENERGY STAR Program Data Collection Activities and Sample Sizes

Activity	Whole Home Path	HVAC Path	Renewable Energy Path	Rural Renewables Bonus
Program Actor Interviews	3			
Tracking Database Review	Census			
Participant Surveys	-	-	95	14
Ongoing Participant Satisfaction Surveys	225	3,425	225	
Trade Ally Surveys	11	8	-	-
Engineering Desk Reviews	-	-	70	-
Verification Site Visits	-	-	10	-

Program Actor Interviews

In September 2019, the Evaluation Team conducted three interviews, each lasting an hour, with the Program Administrator and the Program Implementer. Program actors were engaged with high-level changes in CY 2019 that incorporated lessons learned from changes in CY 2018. These changes involved general performance, areas of success and potential concerns, and potential changes for CY 2020, such as focusing Program messaging on home comfort. Interviews also addressed the new Real Estate Ambassador effort, which trains real estate professionals about how Program offerings can benefit homeowners purchasing existing homes, and Trade Ally outreach, which Focus on Energy continues to emphasize as an important aspect of the Program.

Tracking Database Review

The Evaluation Team reviewed the census of Home Performance Program records in the Focus on Energy database, SPECTRUM. This review involved completing the following tasks:

- Thoroughly review the data to ensure SPECTRUM totals matched the Program Administrator's reported totals
- Reassign savings from a number of database adjustment measures to corresponding Program measures
- Check for complete and consistent applications of information across data fields (e.g., measure names, first-year savings applications, effective useful life [EUL] applications)

Participant Surveys

The Evaluation Team surveyed 109 residential and nonresidential Renewable Energy path participants who had received a rebate through October 2019. The survey collected data to inform the process evaluation (Program satisfaction, equipment satisfaction, demographics) and the impact evaluation (freeridership and spillover).

The sample frame included all Renewable Energy participants to achieve 90% confidence at ±10% precision. The Team targeted 70 responses from residential solar PV and as many responses as possible for nonresidential solar PV and ground-source heat pumps because these populations were smaller.

Table 19 lists the sample targets and completes for the Renewable Energy participant survey.

Table 19. Renewable Energy Participation and Responses by Program Segment and Equipment

Program Segment	Solar PV		Ground-Source Heat Pump	
	Participants [a]	Completes	Participants [a]	Completes
Nonresidential	55	15	1	-
Residential	529	56	62	24
Rural Residential	126	14	-	-
Total	**710**	**85**	**63**	**24**

[a] Participation is through October 2019.

Ongoing Participant Satisfaction Surveys

The PSC requested that the Evaluation Team conduct satisfaction surveys beginning in CY 2019 for the CY 2019-CY 2022 quadrennium, continuing the practice established for the previous quadrennium in CY 2015. There were two objectives for these satisfaction surveys:

- Understand customer satisfaction on an ongoing basis and respond to any changes in satisfaction before the end of the annual reporting schedule
- Help to facilitate timely follow-up with customers to clarify and address service concerns

The Team used SPECTRUM data to sample CY 2019 participants and administered web-based satisfaction surveys throughout the year. The Team mailed paper surveys to participants with no email address on file. The Team combined results from both modes to conduct the analysis. A total of 3,875 Program participants (3,425 HVAC path, 225 Whole Home path, and 225 Renewable Energy path) responded to the CY 2019 survey. The Evaluation Team selected a random sample of 42% of HVAC path surveys (1,428 respondents) for reporting purposes. The survey covered several topics, such as the following:

- Overall satisfaction
- Satisfaction with Program staff and Trade Allies
- Likelihood of recommending the Program
- Likelihood of initiating another energy efficiency improvement
- Open feedback regarding the Program (comments and suggestions)

Trade Ally Interviews

The Evaluation Team conducted interviews with 19 Trade Allies to learn how they interact with the Program and to get their perspective on what Program areas are working well and what improvements can be made.

The Team divided the Whole Home path sample into thirds according to total number of jobs completed in CY 2019. As shown in Table 20, Trade Allies in the top third completed 5% to 11% of all jobs. The Trade Allies in the second third completed 3% to 4% of all jobs. The 90 Trade Allies in the bottom third completed less than 3% of jobs. The Team interviewed 11 Whole Home Trade Allies, six from the top two-thirds of the sample and five from the bottom third.

Table 20. Whole Home Path Trade Ally Interview Sampling

Participation Path	Trade Allies in Sample	Targeted Completes	Actual Completes
More than 4% of jobs (5% to 11%)	5	3	2
Between 3% to 4% of jobs	10	3	4
Less than 3% of jobs	90	4	5
Total	**105**	**10**	**11**

The Team divided the HVAC path into four quarters, as shown in Table 21, because the total number of HVAC Trade Allies (n=1,051) was much larger than the total number of Whole Home Trade Allies. The Team interviewed four Trade Allies from the top two quarters and four from the bottom two quarters.

Table 21. HVAC Path Trade Ally Interview Sampling

Criteria	Trade Allies in Sample	Targeted Completes	Actual Completes
Top 25% of jobs	20	3	3
Second 25% of jobs	46	3	1
Third 25% of jobs	111	2	4
Bottom 25% of jobs	874	2	0
Total	**1,051**	**10**	**8**

Engineering Desk Review

To calculate Renewable Energy path realization rates, the Evaluation Team randomly selected 10 ground-source heat pump (GSHP) applications, 92 residential solar PV applications, and 10 business solar PV applications. The Team verified energy savings for GSHP projects by performing engineering calculations based on system-specific application information paired with algorithms provided in the 2019 TRM. For solar PV participants, the Team verified gross savings by using the PVWatts calculator, available from the National Renewable Energy Laboratory,[19] and information from Program applications. For both GSHP and solar PV participants, the Team also verified that the *ex ante* calculations were conducted in accordance with the TRM.

Verification Site Visits

From the 102 solar PV applications included in the desk review, the Evaluation Team selected 10 for on-site inspections to verify the information on the application. The Team gave priority to sites that the desk review found to have realization rates greater or less than one standard deviation from the sample mean. During site visits, the Team verified the system components and system configuration reported on the project application, including site characteristics such as tilt, azimuth, and shading of the PV arrays. The Team also inspected the installation quality and workmanship, noting any obvious defects.

Impact Evaluation

The Evaluation Team used the following approaches to measure the impact of the CY 2019 Home Performance Program:

- Tracking database review
- Engineering desk reviews
- Verification site visits

[19] National Renewable Energy Laboratory. Accessed December 2019: http://pvwatts.nrel.gov/

Evaluation of Gross Savings

The Evaluation Team assessed gross Program savings through a tracking database review. For Renewable Energy measures, the Team then applied the results from engineering desk reviews (n=112) and verification site visits (n=10) to determine verified gross savings.

Tracking Database Review

The Evaluation Team reviewed the census of CY 2019 Home Performance Program data contained in SPECTRUM for appropriate and consistent application of unit-level savings and EULs in adherence with the TRM.

Whole Home Path

The Evaluation Team adjusted unit EUL for two measures, as shown in Table 22, in accordance with project completion measures in the TRM. The adjustments had a negligible effect on Whole Home path realization rates.

Table 22. CY 2019 Whole Home Path Database Tracking Review Adjustments

Measure (MMID)	Number of Projects	Value	SPECTRUM Per Unit	Adjusted Per Unit
Project Completion, 10% (MMID 3789)	1	EUL	19.6	20
Project Completion, 30% (MMID 3791)	1	EUL	20.5	20

HVAC Path

In accordance with the TRM, the Evaluation Team adjusted unit kWh savings for five measures, unit kW savings for six measures, unit therm savings for 14 measures, and unit EUL for two measures, as shown in Table 23. The adjustments had little effect on HVAC path realization rates because the changes affected a small number of installed units for each measure.

Table 23. CY 2019 HVAC Path Database Tracking Review Adjustments

Measure (MMID)	Number of Projects	Value	SPECTRUM Per Unit	Adjusted Per Unit
NG Furnace with ECM, 95%+ AFUE (Existing) (MMID 1981)	3	Therms	21	20
Furnace and A/C, ECM, 95% + AFUE, >= 16 SEER (MMID 2990)	21	Therms	29	33
		EUL	15 (kWh) 15 (therm)	21.31 (kWh) 20 (therm)
Air Source Heat Pump, >= 16 SEER (MMID 2992)	36	kW	0	0.2823
NG Furnace with ECM, 97%+ AFUE (MMID 3440)	7	Therms	38	39
Boiler, 95%+ AFUE, With DHW, NG (MMID 3559)	2	Therms	277	296
Smart Thermostat, Installed with 95% AFUE NG Furnace (MMID 3612)	1	kWh	70.46	439
		kW	0.117	0
		Therms	86.89	29
Smart Thermostat, Installed with Furnace and A/C (MMID 3614)	15	kWh	70.46	420
		kW	0.117	0
		Therms	86.89	29

Measure (MMID)	Number of Projects	Value	SPECTRUM Per Unit	Adjusted Per Unit
Furnace and A/C, Tier 2, ECM, 95% + AFUE, >= 16 SEER (MMID 3779)	1	Therms	191	172
		EUL	15 (kWh) 15 (therm)	21.31 (kWh) 20 (therm)
NG Furnace with ECM, 96%+ AFUE (MMID 3868)	41	Therms	30	29
NG Furnace with ECM, 98%+ AFUE (MMID 3869)	1	Therms	48	47
NG Furnace with ECM, Tier 2, 96%+ AFUE (MMID 3870)	7	Therms	174	167
NG Furnace with ECM, Tier 2, 98%+ AFUE (MMID 3872)	1	Therms	191	188
Smart Thermostat, Installed with 96% AFUE NG Furnace (MMID 4054)	15	kWh	70.46	439
		kW	0.117	0
		Therms	85.98	29
Smart Thermostat, Installed with 97% AFUE NG Furnace (MMID 4055)	5	kWh	70.46	439
		kW	0.117	0
		Therms	85.18	29
Smart Thermostat, Installed with 98% AFUE NG Furnace (MMID 4056)	1	kWh	70.46	439
		kW	0.117	0
		Therms	84.23	28

Renewable Energy Path

The Evaluation Team adjusted unit EUL for one measure, as shown in Table 24, in accordance with the TRM. The adjustments had a negligible effect on Renewable Energy path realization rates because of the small magnitude of change to a small number of installed units for each measure.

Table 24. CY 2019 Renewable Energy Path Database Tracking Review Adjustments

Measure (MMID)	Number of Projects	Value	SPECTRUM Per Unit	Adjusted Per Unit
Solar PV (MMID 2819)	1	EUL	26.18 (kWh)	25 (kWh)
	1	EUL	34.59 (kWh)	25 (kWh)
	1	EUL	37.55 (kWh)	25 (kWh)

Renewable Energy Path Savings

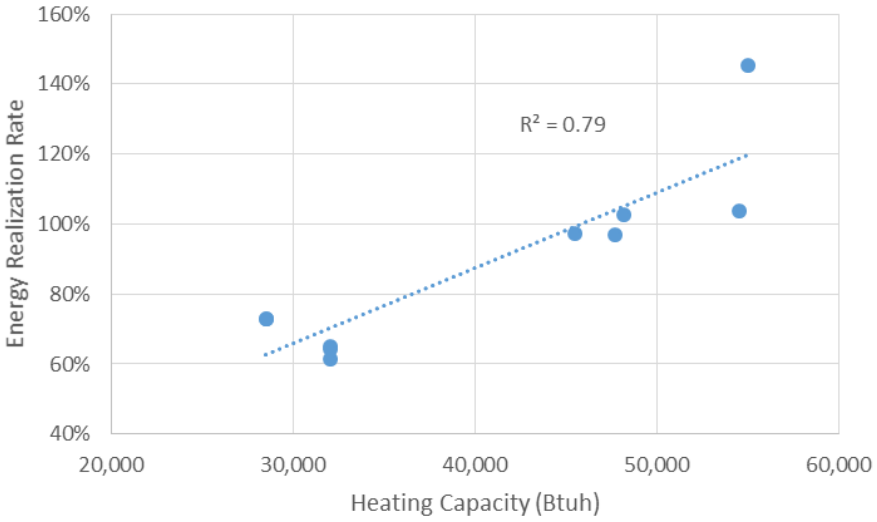
The Evaluation Team conducted 121 desk reviews and 10 site visits to verify Renewable Energy path savings. Those activities are further described below.

Engineering Desk Reviews – GSHPs

The Evaluation Team calculated verified gross energy and demand savings for 10 GSHP applications from the CY 2019 Renewable Energy path using algorithms provided in the TRM along with system- and location-dependent input variables. The Program applied deemed savings from the TRM for *ex ante* energy and demand that did not account for system performance specifications. Due to the differences between verified savings (using system and site-specific inputs) and *ex ante* savings (using deemed values), GSHP project-level energy realization rates ranged from 61% to 145%.

The Team found that energy savings and realization rates were strongly dependent on the heating capacity of the systems installed. Figure 17 shows that systems with lower heating capacity tended to have realization rates in the 60% to 75% range, while systems with higher capacity tended to have realization rates around 100%. The Team also found that average heating capacity was lower than expected, with the heating capacity of sampled sites at 88% of the deemed savings input. The Team confirmed that heating capacities of sampled projects were within 1% of capacities of the entire GSHP population, meaning the sample was representative of the population.

Figure 17. GSHP Realization Rate v. Heating Capacity



On average, the sample's cooling efficiency (EER) was 11% higher than the deemed TRM input, and cooling hours were 7% lower. Other savings inputs, such as heating efficiency (coefficient of precision [COP]) and heating hours, were aligned with the TRM.

As shown in Table 25, these variations in savings inputs resulted in energy and demand realization rates of 88% and 91%, respectively. Overall, the savings for GSHPs fell short of the *ex ante* values, due to smaller than expected system sizes.

Table 25. GSHP Realization Rates by Savings Type

Equipment	kWh Realization Rate	kW Realization Rate
Ground Source Heat Pump	88%	91%

Engineering Desk Reviews – Solar PV

The Evaluation Team also verified gross savings for 92 residential PV participants and 10 business PV participants. The Team reviewed each application for key system characteristics, such as tilt, system size, and azimuth, then identified the sites in Google Earth to confirm orientation details and the accuracy of reported shading. Finally, the Team entered the resulting parameters into PVWatts and created an

hourly generation profile that produced results for annual electricity generation and peak load reduction.

The Team's review of the commercial solar PV installations included a project with *ex ante* energy savings of 661 MWh, which accounted for over one-quarter of the total commercial PV *ex ante* savings. This project was placed into its own "large project" stratum to ensure that its performance did not bias results for the entire Home Performance Program.

Table 26 lists solar PV realization rates, by commercial stratum, total commercial projects, and residential projects. Overall, the evaluated electricity generation for PV systems in the Renewable Energy path aligned with the *ex ante* values, with energy realization rates of 100% for residential projects and 98% for commercial. The evaluated peak demand exceeded the *ex ante* values with 104% (residential) and 112% (commercial) realization rates. The Evaluation Team attributed this overage to a higher portion of systems installed facing mostly east (90° to 135°) and west (225° to 280°) with higher demand realization rates at these azimuths.

Table 26. Solar PV Realization Rates by Savings Type

Sector	Stratum [a]	kWh Realization Rate	kW Realization Rate
Solar PV, Commercial	Large	93%	106%
	Standard	100%	114%
Solar PV, Commercial Total		**98%**	**112%**
Solar PV, Residential Total		**100%**	**104%**
Solar PV, Combined		**100%**	**106%**

[a] Commercial solar PV projects are separated into stratum to account for the large project in the Evaluation Team's desk review that accounted for over one-quarter of the total commercial PV *ex ante* savings (see discussion above).

Verification Site Visits

During the engineering reviews of the Renewable Energy path, the Evaluation Team flagged 10 PV systems for verification site visit analysis because the realization rate was greater or less than one standard deviation from the mean (101% confidence at ±14% precision) or other anomalies were identified. During site visits, the Evaluation Team visually inspected the installation and all major components, measured the available solar resource/shading, and recorded meter readings. The Team also documented notable installation deficiencies (e.g., violations of electrical code, deviations from manufacturer instructions) and compared field observations to Renewable Energy path records.

The Evaluation Team found that, in general, PV arrays were installed and operating as expected, with only the following minor variations from application and SPECTRUM data:

- One site was found to have had an azimuth change on a new construction home that could not be verified through mapping software.
- One site was found with an array tilt inconsistency.

Verified Gross Savings Results

Table 27 lists the annual and lifecycle realization rates for the CY 2019 Program and Program paths. Overall, the Program achieved a first-year evaluated realization rate of 100%, weighted by total (MMBtu) energy savings.

Table 27. CY 2019 Home Performance with ENERGY STAR Program
Annual and Lifecycle Realization Rates

Program Component	Annual Realization Rate				Lifecycle Realization Rate			
	kWh	kW	therms	MMBtu	kWh	kW	therms	MMBtu
HVAC—Flood Relief	100%	101%	100%	100%	100%	101%	100%	100%
HVAC—Standard Track	100%	100%	100%	100%	100%	100%	100%	100%
HVAC—IQT	100%	100%	100%	100%	100%	100%	100%	100%
Whole Home—Standard Track	100%	100%	100%	100%	100%	100%	100%	100%
Whole Home—IQT	100%	100%	100%	100%	100%	100%	100%	100%
Renewable Energy[a]	99%	106%	N/A	99%	99%	106%	N/A	99%
Total	**100%**	**103%**	**100%**	**100%**	**100%**	**103%**	**100%**	**100%**

[a] Includes standard Renewable Energy path and Rural Renewables bonus

Table 28, Table 29, and Table 30 provide the annual and lifecycle realization rates for the CY 2019 Program paths and measure categories within the paths.

Table 28. CY 2019 Whole Home Path Annual and Lifecycle Realization Rates by Measure Category

Program Component	Measure	Annual Realization Rate				Lifecycle Realization Rate			
		kWh	kW	therms	MMBtu	kWh	kW	therms	MMBtu
Whole Home—Standard Track	Project Completion	100%	100%	100%	100%	100%	100%	100%	100%
	Water Heater	100%	100%	100%	100%	100%	100%	100%	100%
Whole Home—Standard Track Total		**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Whole Home—IQT	Project Completion	100%	100%	100%	100%	100%	100%	100%	100%
Whole Home—IQT Total		**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Whole Home Total		**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Table 29. CY 2019 HVAC Path Annual and Lifecycle Realization Rates by Measure Category

Program Component	Measure	Annual Realization Rate				Lifecycle Realization Rate			
		kWh	kW	therms	MMBtu	kWh	kW	therms	MMBtu
HVAC—Flood Relief	Air Source Heat Pump	100%	N/A	N/A	100%	100%	N/A	N/A	100%
	Boiler	N/A	N/A	100%	100%	N/A	N/A	100%	100%
	Ductless Mini-Split Heat Pump	100%	100%	N/A	100%	100%	100%	N/A	100%
	Furnace and A/C	100%	100%	100%	100%	100%	100%	100%	100%
	Furnace with ECM	100%	100%	100%	100%	100%	100%	100%	100%
	Water Heater	100%	100%	100%	100%	100%	100%	100%	100%
HVAC—Flood Relief Total		**100%**	**101%**	**100%**	**100%**	**100%**	**101%**	**100%**	**100%**
HVAC—Standard Track	Air Source Heat Pump	100%	N/A	N/A	100%	100%	N/A	N/A	100%
	Boiler	N/A	N/A	100%	100%	N/A	N/A	100%	100%
	Ductless Mini-Split Heat Pump	100%	100%	N/A	100%	100%	100%	N/A	100%
	ECM	100%	100%	N/A	100%	100%	100%	N/A	100%
	Furnace and A/C	100%	100%	100%	100%	100%	100%	100%	100%
	Furnace with ECM	100%	100%	100%	100%	100%	100%	100%	100%
	Smart Thermostat	100%	0%	99%	100%	100%	0%	99%	100%
	Tune-Up	100%	100%	100%	100%	100%	100%	100%	100%
	Water Heater	N/A	N/A	100%	100%	N/A	N/A	100%	100%
HVAC—Standard Track Total		**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
HVAC—IQT	Boiler	N/A	N/A	100%	100%	N/A	N/A	100%	100%
	Furnace	N/A	N/A	100%	100%	N/A	N/A	100%	100%
	Furnace and A/C	100%	100%	100%	100%	100%	100%	100%	100%
	Furnace with ECM	100%	100%	100%	100%	100%	100%	100%	100%
	Water Heater	N/A	N/A	100%	100%	N/A	N/A	100%	100%
HVAC—IQT Total		**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
HVAC Total		**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Table 30. CY 2019 Renewable Energy Path Annual and Lifecycle Realization Rates by Measure Category

Program Component	Measure	Annual Realization Rate				Lifecycle Realization Rate			
		kWh	kW	therms	MMBtu	kWh	kW	therms	MMBtu
Renewable Energy	Ground Source Heat Pump	88%	91%	N/A	88%	88%	91%	N/A	88%
	Solar PV[a]	100%	106%	N/A	100%	99%	106%	N/A	99%
Renewable Energy Total		**99%**	**106%**	**N/A**	**99%**	**99%**	**106%**	**N/A**	**99%**

[a] Includes standard Renewable Energy path and Rural Renewables bonus

Table 31 lists the *ex ante* and verified annual gross savings for CY 2019 by Program component. These savings are also listed for the Whole Home path (Table 32), HVAC path (Table 33), and Renewable Energy path (Table 34).

Table 31. CY 2019 Home Performance with ENERGY STAR Program First-Year Gross Savings Summary

Program Component	*Ex Ante* Gross First Year			Verified Gross First Year		
	kWh	kW	therms	kWh	kW	therms
HVAC—Flood Relief	160,390	28	9,284	160,390	28	9,282
HVAC—Standard Track	14,189,676	2,247	1,004,540	14,203,156	2,253	1,002,492
HVAC—IQT	409,300	100	165,573	409,300	100	165,502
Whole Home—Standard Track	963,102	408	292,968	963,102	408	292,968
Whole Home—IQT	128,957	61	74,754	128,957	61	74,754
Renewable Energy[a]	10,272,701	3,369	0	10,180,090	3,561	0
Total First Year	**26,124,127**	**6,213**	**1,547,119**	**26,044,996**	**6,411**	**1,544,998**

[a] Includes standard Renewable Energy path and Rural Renewables bonus

Table 32. CY 2019 Whole Home Path First-Year Gross Savings Summary by Measure Category

Program Component	Measure	*Ex Ante* Gross First Year			Verified Gross First Year		
		kWh	kW	therms	kWh	kW	therms
Whole Home—Standard Track	Project Completion	959,782	408	292,771	959,782	408	292,771
	Water Heater	3,321	0	197	3,321	0	197
Whole Home—Standard Track Total		**963,102**	**408**	**292,968**	**963,102**	**408**	**292,968**
Whole Home—IQT	Project Completion	128,957	61	74,754	128,957	61	74,754
Whole Home—IQT Total		**128,957**	**61**	**74,754**	**128,957**	**61**	**74,754**
Whole Home Total		**1,092,059**	**469**	**367,722**	**1,092,059**	**469**	**367,722**

Table 33. CY 2019 HVAC Path First-Year Gross Savings Summary by Measure Category

Program Component	Measure	*Ex Ante* Gross First Year			Verified Gross First Year		
		kWh	kW	therms	kWh	kW	therms
HVAC—Flood Relief	Air Source Heat Pump	928	0	0	928	0	0
	Boiler	0	0	2,424	0	0	2,424
	Ductless Mini-Split Heat Pump	50,782	2	0	50,782	2	0
	Furnace and A/C	13,986	7	891	13,986	7	891
	Furnace with ECM	93,184	18	5,395	93,184	18	5,393
	Water Heater	1,510	0	574	1,510	0	574
HVAC—Flood Relief Total		**160,390**	**28**	**9,284**	**160,390**	**28**	**9,282**
HVAC—Standard Track	Air Source Heat Pump	33,408	0	0	33,408	10	0
	Boiler	0	0	127,790	0	0	127,828
	Ductless Mini-Split Heat Pump	870,402	-208	0	870,402	-208	0
	ECM	41,500	8	0	41,500	8	0
	Furnace and A/C	2,015,538	1,078	128,319	2,015,538	1,078	128,403
	Furnace with ECM	7,167,680	1,365	453,671	7,167,680	1,365	453,619
	Smart Thermostat	4,060,675	4	279,308	4,074,155	0	277,190
	Tune-Up	473	1	1,636	473	1	1,636
	Water Heater	0	0	13,816	0	0	13,816

Program Component	Measure	*Ex Ante* Gross First Year			Verified Gross First Year		
		kWh	kW	therms	kWh	kW	therms
HVAC—Standard Track Total		**14,189,676**	**2,247**	**1,004,540**	**14,203,156**	**2,253**	**1,002,492**
HVAC—IQT	Boiler	0	0	5,506	0	0	5,506
	Furnace	0	0	12,480	0	0	12,480
	Furnace and A/C	65,268	35	21,691	65,268	35	21,672
	Furnace with ECM	344,032	65	125,280	344,032	65	125,228
	Water Heater	0	0	616	0	0	616
HVAC—IQT Total		**409,300**	**100**	**165,573**	**409,300**	**100**	**165,502**
HVAC Total		**14,759,367**	**2,375**	**1,179,396**	**14,772,846**	**2,382**	**1,177,276**

Table 34. CY 2019 Renewable Energy Path First-Year Gross Savings Summary by Measure Category

Program Component	Measure	*Ex Ante* Gross First Year			Verified Gross First Year		
		kWh	kW	therms	kWh	kW	therms
Renewable Energy	Ground Source Heat Pump	386,126	78	0	339,791	71	0
	Solar PV[a]	9,886,575	3,290	0	9,840,300	3,490	0
Renewable Energy Total		**10,272,701**	**3,369**	**0**	**10,180,090**	**3,561**	**0**

[a] Includes standard Renewable Energy path and Rural Renewables bonus

Table 35 lists the *ex ante* and verified gross lifecycle savings by Program component for the Program in CY 2019. These savings are also listed for the Whole Home path (Table 36), HVAC path (Table 37), and Renewable Energy path (Table 38).

Table 35. CY 2019 Home Performance with ENERGY STAR Program Lifecycle Gross Savings Summary

Program Component	*Ex Ante* Gross Lifecycle			Verified Gross Lifecycle		
	kWh	kW	therms	kWh	kW	therms
HVAC—Flood Relief	3,111,098	28	183,456	3,111,098	28	183,415
HVAC—Standard Track	243,860,980	2,247	17,196,144	243,995,776	2,253	17,179,412
HVAC—IQT	8,268,285	100	3,307,425	8,268,285	100	3,306,960
Whole Home—Standard Track	19,238,747	408	5,858,387	19,238,801	408	5,857,986
Whole Home—IQT	2,579,140	61	1,495,080	2,579,140	61	1,495,080
Renewable Energy[a]	253,123,772	3,369	0	251,104,351	3,561	0
Total Lifecycle	**530,182,022**	**6,213**	**28,040,491**	**528,297,451**	**6,411**	**28,022,854**

[a] Includes standard Renewable Energy path and Rural Renewables bonus

Table 36. CY 2019 Whole Home Path Lifecycle Gross Savings by Measure Category

Program Component	Measure	*Ex Ante* Gross First Year			Verified Gross First Year		
		kWh	kW	therms	kWh	kW	therms
Whole Home—Standard Track	Project Completion	19,195,578	408	5,855,820	19,195,632	408	5,855,420
	Water Heater	43,169	0	2,567	43,169	0	2,566
Whole Home—Standard Track Total		**19,238,747**	**408**	**5,858,387**	**19,238,801**	**408**	**5,857,986**
Whole Home—IQT	Project Completion	2,579,140	61	1,495,080	2,579,140	61	1,495,080
Whole Home—IQT Total		**2,579,140**	**61**	**1,495,080**	**2,579,140**	**61**	**1,495,080**
Whole Home Total		**21,817,887**	**469**	**7,353,467**	**21,817,941**	**469**	**7,353,066**

Table 37. CY 2019 HVAC Path Lifecycle Gross Savings by Measure Category

Program Component	Measure	*Ex Ante* Gross First Year			Verified Gross First Year		
		kWh	kW	therms	kWh	kW	therms
HVAC—Flood Relief	Air Source Heat Pump	16,704	0	0	16,704	0	0
	Boiler	0	0	48,480	0	0	48,480
	Ductless Mini-Split Heat Pump	914,076	2	0	914,076	2	0
	Furnace and A/C	298,053	7	17,820	298,053	7	17,820
	Furnace with ECM	1,863,680	18	107,900	1,863,680	18	107,860
	Water Heater	18,585	0	9,256	18,585	0	9,255
HVAC—Flood Relief Total		**3,111,098**	**28**	**183,456**	**3,111,098**	**28**	**183,415**
HVAC—Standard Track	Air Source Heat Pump	601,344	0	0	601,344	10	0
	Boiler	0	0	2,555,800	0	0	2,556,560
	Ductless Mini-Split Heat Pump	15,667,236	-208	0	15,667,236	-208	0
	ECM	747,000	8	0	747,000	8	0
	Furnace and A/C	42,884,100	1,078	2,563,335	42,884,100	1,078	2,568,060
	Furnace with ECM	143,353,600	1,365	9,073,420	143,353,600	1,365	9,072,380
	Smart Thermostat	40,606,755	4	2,793,077	40,741,550	0	2,771,900
	Tune-Up	946	1	3,272	946	1	3,272
	Water Heater	0	0	207,240	0	0	207,240
HVAC—Standard Track Total		**243,860,980**	**2,247**	**17,196,144**	**243,995,776**	**2,253**	**17,179,412**
HVAC—IQT	Boiler	0	0	110,120	0	0	110,120
	Furnace	0	0	249,600	0	0	249,600
	Furnace and A/C	1,387,645	35	432,865	1,387,645	35	433,440
	Furnace with ECM	6,880,640	65	2,505,600	6,880,640	65	2,504,560
	Water Heater	0	0	9,240	0	0	9,240
HVAC—IQT Total		**8,268,285**	**100**	**3,307,425**	**8,268,285**	**100**	**3,306,960**
HVAC Total		**255,240,363**	**2,375**	**20,687,024**	**255,375,158**	**2,382**	**20,669,787**

Table 38. CY 2019 Renewable Energy Path Lifecycle Gross Savings by Measure Category

Program Component	Measure	*Ex Ante* Gross First Year			Verified Gross First Year		
		kWh	kW	therms	kWh	kW	therms
Renewable Energy	Ground Source Heat Pump	5,791,890	78	0	5,096,863	71	0
	Solar PV[a]	247,331,882	3,290	0	246,007,488	3,490	0
Renewable Energy Total		**253,123,772**	**3,369**	**0**	**251,104,351**	**3,561**	**0**

[a] Includes standard Renewable Energy path and Rural Renewables bonus

Evaluation of Net Savings

The Evaluation Team calculated net savings for the Whole Home and HVAC paths by applying findings from previous NTG research to CY 2019 Program data. For the Renewable Energy path, the Team conducted surveys with CY 2019 Renewable Energy participants to assess measure-level NTG ratios. For

a detailed description of NTG analysis methodology and findings, refer to *Appendix I. Net Savings Analysis* in Volume III.

Whole Home Path

In CY 2019 the Program began applying prescriptive *ex ante* savings to air sealing and insulation completion projects. These savings were based on results from the CY 2017 billing analysis and a targeted review of billing data from 849 projects.

CY 2019 tracking data included prescriptive completion projects and modeled projects that were started in CY 2018. Because savings for the prescriptive projects already accounted for findings from the CY 2017 billing analysis, the Evaluation Team applied a 100% NTG ratio to these projects. For modeled projects, the Team continued to apply NTG results from the CY 2017 billing analysis.[20]

Table 39 lists NTG ratios the Evaluation Team applied to verified savings for whole-home projects.

Table 39. NTG Ratios Applied to CY 2019 Whole Home Projects

Track	Savings Type	NTG Modeled Projects	NTG Prescriptive Projects
Standard Track (Tier 1)	Electricity	105%	100%
	Natural Gas	39%	
Income-Qualified Track (Tier 2)	Electricity	153%	
	Natural Gas	43%	

HVAC Paths

The HVAC path did not undergo significant changes in CY 2019; therefore, the Evaluation Team continued to apply results from the CY 2017 standard market practice analysis to CY 2019 *ex ante* savings for furnaces, joint furnaces, air conditioners, and electronically commutated motors (ECMs). This meant applying the same net-of-freeridership savings to these measures as derived for CY 2017. In some cases, the *ex ante* savings had changed slightly from previous evaluation years, which altered the freeridership and NTG fractions for these measures.

For the remaining standard track HVAC path measures, the Evaluation Team continued to apply participant self-response freeridership and spillover scores from the CY 2015 Residential Rewards surveys and CY 2016 Smart Thermostat Pilot surveys to CY 2019 *ex ante* savings.

To calculate final NTG ratios, the Team combined self-reported freeridership and spillover for measures not in the standard market practice analysis using the following equation.

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

[20] More details regarding the billing analysis methods and findings can be found in the CY 2017 evaluation report. Cadmus. May 22, 2018. *Focus on Energy Calendar Year 2017 Evaluation Report. Volume II.* 99-105. https://focusonenergy.com/sites/default/files/WI%20FOE%20CY%202017%20Volume%20II%20FIN/AL.pdf

Table 40 lists the freeridership and spillover source by measure for the standard track HVAC path, including Flood Relief projects.

Table 40. CY 2019 NTG Source by Measure Type, Standard HVAC Track (Tier 1)

Measure	NTG Source	Freeridership	Spillover	NTG
Air-Source Heat Pump	CY 2015 Residential Rewards Participant Surveys	77%	6%	29%
Boiler	CY 2015 Residential Rewards Participant Surveys	77%	6%	29%
Ductless Mini-Split Heat Pump	CY 2015 Residential Rewards Participant Surveys	77%	6%	29%
ECM	Standard Market Practice [a]	Varies	6%	Varies
Furnace and Air Conditioner	Standard Market Practice [a]	Varies	6%	Varies
Furnace with ECM	Standard Market Practice [a]	Varies	6%	Varies
HVAC Tune-Up	CY 2015 Residential Rewards Participant Surveys [b]	100%	0%	0%
Indirect Water Heater	CY 2015 Residential Rewards Participant Surveys	77%	6%	29%
Smart Thermostat, Existing HVAC System	CY 2016 Smart Thermostat Pilot Surveys	29%	1%	72%
Smart Thermostat, Installed w/ HVAC Measure	CY 2016 Smart Thermostat Pilot Surveys	29%	1%	72%

[a] Freeridership scores were determined using standard market practice, which varies by savings and measure type.
[b] HVAC Tune-ups were new measures in CY 2019. In absence of measure-specific NTG research, the Team applied freeridership and spillover assumptions from the CY 2015 participant surveys.

As in past years, the Team assumed a 100% NTG ratio for measures installed through the income-qualified track (Tier 2).

Renewable Energy Path

The Evaluation Team used CY 2019 participant surveys to assess net savings for the Renewable Energy path. The survey's self-report NTG battery included questions that allowed the Team to calculate freeridership (measures that would have been purchased without the Program's influence) and spillover (Program-induced energy-saving actions).

To calculate the measures' final NTG ratios, the Evaluation Team then combined self-reported freeridership and spillover results using the following equation. *Appendix I* provides a complete review of the Team's self-report NTG analysis and findings.

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

Table 41 shows freeridership and spillover results and final NTGs for Renewable Energy measures.

Table 41. Renewable Energy Path Freeridership and Spillover Results

Measure	Freeridership	Spillover	NTG (1 – Freeridership + Spillover)
Ground Source Heat Pump	56%	1%	45%
Solar PV	40%	0%	60%

Net Savings Results

By combining the NTG approaches for all three paths, the Evaluation Team calculated a Program-wide NTG of 85% for CY 2019. Table 42 shows freeridership, spillover, and NTG results at the measure and path levels, and the whole Program's final NTG.

Table 42. CY 2019 Home Performance with ENERGY STAR Program Spillover, Freeridership, and Net-to-Gross Values by Measure

Program Component	Measure	Spillover	Freeridership	NTG Ratio
HVAC—Standard Track	Air-Source Heat Pump	6%	77%	29%
	Boiler	6%	77%	29%
	Ductless Mini-Split Heat Pump	6%	77%	29%
	ECM	6%	18%	88%
	Furnace and Air Conditioner	6%	3%	103%
	Heat Pump Water Heater	0%	0%	100%
	LP Furnace with ECM	6%	19%	87%
	Natural Gas Furnace with ECM, 95%	6%	0%	106%
	Natural Gas Furnace with ECM, 96%	6%	2%	104%
	Natural Gas Furnace with ECM, 97%	6%	-2%	108%
	Natural Gas Furnace with ECM, 98%	6%	-11%	117%
	Smart Thermostat	1%	29%	72%
	Tune-Up	0%	0%	100%
	Water Heater, Indirect	6%	77%	29%
	Water Heater, NG	0%	0%	100%
HVAC—IQT	IQT Measures	0%	0%	100%
HVAC Path Total				**87%**
Whole Home—Standard Track	Whole Home Measure	N/A	N/A	68%
Whole Home—IQT	Whole Home Measure	N/A	N/A	70%
Whole Home Path Total				**100%**
Renewable Energy	Ground Source Heat Pump	1%	56%	45%
	Solar PV	0%	40%	60%
Renewable Energy Total				**59%**
Program Total				**85%**

Table 43 through Table 46 show the annual net demand and energy impacts (kWh, kW, and therms) by measure category and Program path. The Evaluation Team attributed these savings as net of what would have occurred naturally without the presence of the Program.

Table 43. Home Performance with ENERGY STAR Program Annual Net Savings

Measure	First-Year Net		
	kWh	kW	therms
HVAC—Flood Relief	109,871	21	8,124
HVAC—Standard Track	11,211,463	1,741	896,743
HVAC—IQT	409,300	100	165,502
Whole Home—Standard Track	980,992	415	187,761
Whole Home—IQT	143,713	67	50,594
Renewable Energy [a]	6,057,086	2,126	0
Total First Year	**18,912,426**	**4,470**	**1,308,724**

[a] Includes standard Renewable Energy path and Rural Renewables bonus

Table 44. Whole Home Path Annual Net Savings by Measure Category

Program Component	Measure	First-Year Net		
		kWh	kW	therms
Whole Home—Standard Track	Project Completion	977,672	415	187,564
	Water Heater	3,321	0	197
Whole Home—Standard Track Total		**980,992**	**415**	**187,761**
Whole Home—IQT	Project Completion	143,713	67	50,594
Whole Home—IQT Total		**143,713**	**67**	**50,594**
Whole Home Total		**1,124,706**	**482**	**238,355**

Table 45. HVAC Path Annual Net Savings by Measure Category

Program Component	Measure	First-Year Net		
		kWh	kW	therms
HVAC—Flood Relief	Air Source Heat Pump	269	0	0
	Boiler	0	0	703
	Ductless Mini-Split Heat Pump	14,727	1	0
	Furnace and A/C	11,869	4	1,001
	Furnace with ECM	81,496	16	6,097
	Water Heater	1,510	0	324
HVAC—Flood Relief Total		**109,871**	**21**	**8,124**
HVAC—Standard Track	Air Source Heat Pump	9,688	3	0
	Boiler	0	0	37,070
	Ductless Mini-Split Heat Pump	252,417	-60	0
	ECM	36,376	7	0
	Furnace and A/C	1,710,507	597	144,184
	Furnace with ECM	6,268,611	1,193	510,269
	Smart Thermostat	2,933,392	0	199,577
	Tune-Up	473	1	1,636
	Water Heater	0	0	4,007

Program Component	Measure	First-Year Net		
		kWh	kW	therms
HVAC—Standard Track Total		**11,211,463**	**1,741**	**896,743**
HVAC—IQT	Boiler	0	0	5,506
	Furnace	0	0	12,480
	Furnace and A/C	65,268	35	21,672
	Furnace with ECM	344,032	65	125,228
	Water Heater	0	0	616
HVAC—IQT Total		**409,300**	**100**	**165,502**
HVAC Total		**11,730,634**	**1,862**	**1,070,369**

Table 46. Renewable Energy Path Annual Net Savings by Measure Category

Program Component	Measure	First-Year Net		
		kWh	kW	therms
Renewable Energy	Ground Source Heat Pump	152,906	32	0
	Solar PV [a]	5,904,180	2,094	0
Renewable Energy Total		**6,057,086**	**2,126**	0

[a] Includes standard Renewable Energy path and Rural Renewables bonus

Table 47 through Table 50 list the lifecycle net demand and energy impacts (kWh, kW, and therms) by measure category and by Program path.

Table 47. Home Performance with ENERGY STAR Program Lifecycle Net Savings

Measure	Lifecycle Net		
	kWh	kW	therms
HVAC—Flood Relief	2,171,368	21	161,516
HVAC—Standard Track	196,473,769	1,741	15,889,603
HVAC—IQT	8,268,285	100	3,306,960
Whole Home—Standard Track	19,596,600	415	3,753,840
Whole Home—IQT	2,874,265	67	1,011,880
Renewable Energy[a]	149,898,081	2,126	0
Total Lifecycle	**379,282,368**	**4,470**	**24,123,799**

[a] Includes standard Renewable Energy path and Rural Renewables bonus

Table 48. Whole Home Path Lifecycle Net Savings by Measure Category

Program Component	Measure	Lifecycle Net		
		kWh	kW	therms
Whole Home—Standard Track	Project Completion	19,553,431	415	3,751,274
	Water Heater	43,169	0	2,566
Whole Home—Standard Track Total		**19,596,600**	**415**	**3,753,840**
Whole Home—IQT	Project Completion	2,874,265	67	1,011,880
Whole Home—IQT Total		**2,874,265**	**67**	**1,011,880**
Whole Home Total		**22,470,865**	**482**	**4,765,720**

Table 49. HVAC Path Lifecycle Net Savings by Measure Category

Program Component	Measure	Lifecycle Net		
		kWh	kW	therms
HVAC—Flood Relief	Air Source Heat Pump	4,844	0	0
	Boiler	0	0	14,059
	Ductless Mini-Split Heat Pump	265,082	1	0
	Furnace and A/C	252,946	4	20,010
	Furnace with ECM	1,629,912	16	121,941
	Water Heater	18,585	0	5,507
HVAC—Flood Relief Total		**2,171,368**	**21**	**161,516**
HVAC—Standard Track	Air Source Heat Pump	174,390	3	0
	Boiler	0	0	741,402
	Ductless Mini-Split Heat Pump	4,543,498	-60	0
	ECM	654,767	7	0
	Furnace and A/C	36,394,031	597	2,883,687
	Furnace with ECM	125,372,221	1,193	10,205,374
	Smart Thermostat	29,333,916	0	1,995,768
	Tune-Up	946	1	3,272
	Water Heater	0	0	60,100
HVAC—Standard Track Total		**196,473,769**	**1,741**	**15,889,603**
HVAC—IQT	Boiler	0	0	110,120
	Furnace	0	0	249,600
	Furnace and A/C	1,387,645	35	433,440
	Furnace with ECM	6,880,640	65	2,504,560
	Water Heater	0	0	9,240
HVAC—IQT Total		**8,268,285**	**100**	**3,306,960**
HVAC Total		**206,913,422**	**1,862**	**19,358,079**

Table 50. Renewable Energy Path Lifecycle Net Savings by Measure Category

Program Component	Measure	Lifecycle Net		
		kWh	kW	therms
Renewable Energy	Ground Source Heat Pump	2,293,588	32	0
	Solar PV [a]	147,604,493	2,094	0
Renewable Energy Total		**149,898,081**	**2,126**	**0**

[a] Includes standard Renewable Energy path and Rural Renewables bonus

Process Evaluation

The Evaluation Team focused the process evaluation on the following key topics:

- Renewable Energy participant satisfaction and experience
- Rural Renewables participant satisfaction and experience

- Whole Home and HVAC Trade Ally satisfaction and experience
- Customers' perceptions of Focus on Energy and participation drivers

Program Design, Delivery, and Goals

The Evaluation Team reviewed information from stakeholder interviews, participant survey responses, and Trade Ally interviews to identify Program changes or challenges in CY 2019.

During CY 2019, the Program focused on extending its relationship with Trade Allies. It also developed resources for Real Estate Ambassadors to obtain support from real estate professionals in promoting the Program to new homeowners. Trade Allies and Real Estate Ambassadors received training and marketing materials so they could directly inform customers about the benefits of Program participation, such as greater home comfort and higher energy savings. The Program also sought to increase participation by offering larger incentives to income-qualified Whole Home and HVAC customers and a Rural Renewables bonus to residential customers who installed solar PV in designated rural zip codes.

Program Management and Delivery Structure

The Home Performance with ENERGY STAR Program consists of three main paths: Whole Home, HVAC, and Renewable Energy. In general, each path kept the same offerings and implementation design in CY 2019 as in CY 2018. This section describes the management and delivery structure for each path.

Whole Home Path

The Whole Home path is designed for customers who are planning to complete comprehensive upgrades to their home. First, participants must use a participating Trade Ally who is certified through the Building Performance Institute (BPI) to conduct a home energy assessment that includes a comprehensive walk-through of the customer's home.

Through April 2019, all customers received a written report with an overview of the home's energy use as well as recommendations for building shell and/or HVAC measures to improve energy efficiency in the home. Customers could then select a combination of building shell and/or HVAC measures they want to complete or install in their home to receive a rebate.

Starting in May 2019, the Program began offering prescriptive rebates for insulation measures. With that transition, the Program did not require that customers receive a report for insulation measures. However, a report was still required for customers to receive a rebate for ENERGY STAR-qualified air sealing measures.

HVAC Path

In the HVAC path, residential customers are eligible to participate without completing the home energy assessment and can work directly with a participating HVAC Trade Ally. Participation is limited to heating and cooling equipment such as air conditioners and furnaces. Building shell equipment, such as attic insulation, is reserved for the Whole Home path participants.

The Whole Home and the HVAC paths offer two tiers of participation:

- Tier 1, the standard track, is available to all Focus on Energy customers who own residential properties with three units or less.
- Tier 2, the income-qualified track, offers higher incentives for most upgrades to owners of the same property types. Household incomes must be at or below 80% of the state median household income.

Both tiers offer the same equipment. Tier 2 offers higher incentives for the qualified measure installation; in this tier, customers are required to verify their income to determine eligibility. Table 51 shows the Tier 1 and Tier 2 equipment offerings and incentives for the Whole Home and HVAC paths.

Table 51. CY 2019 Home Performance with ENERGY STAR Whole Home and HVAC Path Equipment and Incentives

Equipment	Tier 1 Incentive	Tier 2 Incentive
Prescriptive Offerings		
Air sealing [a]	$600	$900
Boiler 95%+ AFUE with DWH	$500	$675
Duct sealing [a]	$50	
Ductless mini-split heat pump, replacing electric resistance	$500	
ECM for furnace (new or replacement)	$100	
Furnace 95%+ AFUE, A/C 16+ SEER, and ECM	$250	$750
HVAC tune-up	$125-$175	
Heat pump water heater	$300	
Hot water boiler 95%+ AFUE	$400	$550
Insulation – attic [a]	$500	$600
Insulation – foundation [a]	$100	$150
Insulation – wall [a]	$300	
LP furnace 90%+ AFUE with ECM	$100	$300
NG furnace 95%+ AFUE with ECM	$125	$525
NG furnace 96%+ AFUE with ECM	$125	$525
NG furnace 97%+ AFUE with ECM	$125	$525
NG furnace 98%+ AFUE with ECM	$125	$525
NG furnace 95%+ AFUE	-	$350
Smart thermostat with existing ASHP, boiler, or furnace	$75	
Smart thermostat with 95%+ AFUE boiler or furnace	$125	
Water heater, indirect	$100	$125
Water heater, NG, EF of 0.67+	$200	
Whole Home Path Bonus Savings		
Energy assessment fee [a]	$150	
Project completion 10% reduced energy use [a]	$850	$1,000
Project completion 20% reduced energy use [a]	$1,250	$1,500
Project completion 30% reduced energy use [a]	$2,000	$2,250

[a] Available only for Whole Home path participants

Renewable Energy Path

The Home Performance Program offers incentives to residential, multifamily, and small business customers for installing renewable energy measures (solar PV or ground-source heat pumps). To increase uptake in rural communities, the Program also offers a Rural Renewables bonus to residential customers who install solar PV in designated rural zip codes.

Table 52 shows the Renewable Energy equipment offerings and incentives offered to Focus on Energy customers.

Table 52. CY 2019 Home Performance with ENERGY STAR Renewable Energy Path Equipment and Incentives

Measure	Residential Incentives (including Multifamily dwellings with three or less units)	Rural Renewables Bonus (in addition to Residential Incentive)
GSHP	$650 (no additional rural incentive)	
Solar PV (Between 45 degrees to 90 degrees of due south)	12% of installed cost, up to $1,500	12% of installed cost, up to $1,500
Solar PV (Within 45 degrees of due south)	12% of installed cost, up to $2,000	12% of installed cost, up to $2,000
Measure	**Nonresidential (commercial and Multifamily housing with more than three units)**	
GSHP	$650	
Solar PV (Between 45 degrees to 90 degrees of due south)	12% of installed cost, up to $3,000	
Solar PV (Within 45 degrees of due south)	12% of installed cost, up to $4,000	

Program Changes

Focus on Energy made several changes to the Home Performance with ENERGY STAR Program for CY 2019 to drive greater participation across the different paths. It updated the incentive structure, customer targeting, and marketing and outreach tactics. Focus on Energy made a further change in CY 2019 by allowing customers to receive a rebate through the Whole Home path based on the equipment they installed rather than using a test-in/test-out blower-door method to calculate infiltration reduction. These Program changes are described below.

Prescriptive Whole Home Path Updates

In CY 2019, the whole-home path changed to a prescriptive structure. The Whole Home path's prescriptive incentives build on prescriptive measures that have historically been offered through the HVAC path and now include building shell measures such as insulation, air sealing, and duct sealing.

Whole Home customers can now receive rebates for measures without the need for blower-door testing. Previously, participants could receive a rebate only if a participating Trade Ally conducted a blower-door test before and after measures were completed or installed to confirm that the new measures reduced air infiltration. A blower-door test can be optionally completed and additional incentives are available when air infiltration is reduced 10% to 30%; however, the blower-door test is not tied to incentives for what the customer has already installed.

The Evaluation Team asked Whole Home Trade Allies about the customer response to the changes. Overall, Trade Allies said customer feedback has been positive because they are no longer required to complete the infiltration test and can pick the measures they want installed while still receiving the rebate. The Program Implementer also noted an uptake in air sealing and attic insulation in CY 2019.

Only one Trade Ally expressed dissatisfaction with the prescriptive change, citing it as a loss of opportunity to install more comprehensive measures. The Trade Ally said customers can neglect small incentive measures (such as duct sealing) that add up to big energy savings and recommended looking into the possibility of bundling measures for incentives so smaller measures can still be part of the discussion with customers about home upgrades.

Rural Renewables Bonus

The Renewable Energy path expanded its outreach by offering rural residential participants who install solar PV an additional $2,000 incentive and allowing a maximum incentive of $4,000 instead of the $2,000 offered to statewide residential customers.[21]

In CY 2019, 175 participants received the Rural Renewables bonus; representing 21% of all residential Renewable Energy participants. Of the 14 rural respondents to the Renewable Energy participant survey, three said the rebate was their top motivator to participate, and five said it was their second highest motivator after environment reasons.

Participants who received the bonus are primarily considered core Renewable Energy path participants; therefore, savings from rural bonus participants are counted toward the core Renewable Energy path. However, bonus incentives are dispensed from Focus on Energy's budget for rural programs.

Real Estate Ambassadors

A new approach to marketing in CY 2019 included engaging real estate experts, as Real Estate Ambassadors, to introduce customers to Focus on Energy, help customers understand specifics about the Home Performance Program, and encourage participation for new homeowners. Training includes two main topics:

- Program-specific information, such as incentives and walking through the various paths
- Basic home energy efficiency training

The Program Implementer said introducing the Real Estate Ambassador effort was successful, with such high demand and engagement from the real estate industry that it is changing from recruiting and training to relationship maintenance.

On behalf of Focus on Energy, in April 2019 Real Estate Ambassadors began sending welcome kits to new homeowners about four to six weeks after their closing date. The kits include a booklet on how to

[21] The rural path was designed as part of Focus on Energy's effort to address the PSC's initiative to enhance Focus on Energy services to rural customers. In CY 2018, the Home Performance Program targeted rural customers by offering increased incentives in the Whole Home path.

save energy in the home and a voucher for a $125 HVAC tune-up that can be used through the Home Performance Program. The Program Implementer intends for the tune-up voucher to add value to the real estate Ambassadors and their clients and is a way to introduce potential Program participants to a Trade Ally who could engage them further.

Ambassadors distributed 1,176 kits to new homeowners in CY 2019. Of those, 107 customers used their tune-up voucher in CY 2019. Though Program staff admitted that tune-up voucher use was lower than expected, the Program Implementer hoped customers would take advantage of them within a year or two of moving in, especially in the colder winter months. Despite lower than expected tune-up voucher use, in April 2020 the Program Implementer reported around 20,000 website hits from customers who engaged with Focus on Energy through the Real Estate Ambassador initiative. Focus on Energy can use contact information from these customers for future marketing and cross-promotional efforts.

Recruitment for Real Estate Ambassadors started in January 2019 and continued throughout the year. The Program Implementer initially began with outreach to recruit real estate professionals, but as the months passed, more real estate professionals showed strong interest. The Program Implementer reported positive feedback, especially for learning more about energy efficiency opportunities.

Program Goals

The Program's overall objective is to encourage customers to use more energy-efficient products. Table 53 shows the savings goals for the CY 2019 Home Performance Program set by Focus on Energy.[22]

Table 53. Home Performance with ENERGY STAR Program Goals

Program Path	Demand Reduction Goal (kW)	Lifecycle Electric Reduction Goal (kWh)	Lifecycle Natural Gas Goal (Therm)
Home Performance with ENERGY STAR	3,059	276,433,208	26,685,408
Renewable Energy - Business	701	53,448,378	-
Renewable Energy - Residential[a]	2,041	153,135,543	-
Total	**5,801**	**483,017,129**	**26,685,408**

[a] Includes goals for the standard Renewable Energy path and the Rural Renewables bonus.

The Home Performance with ENERGY STAR path met its energy and gas saving goals in CY 2019, but did not meet its demand reduction goal. The Renewable Energy path met both of its electric savings goals.

[22] Metrics presented in this section represent Focus on Energy's targets for the Program, and not contractual goals for the Program Implementer. The Program Implementer is required to meet a gross lifecycle MMBtu goal in addition to fuel-specific savings targets.

Marketing and Outreach

Home Performance marketing is managed by the Program Implementer. Trade Allies provide support by promoting the Program directly to their customers as part of their business. The Program Implementer also uses traditional utility marketing outlets such as online ads, bill inserts, and social media to promote the Program. This section discusses the Home Performance Program's marketing and outreach for CY 2019.

Program Staff Marketing Tactics

In 2019, Focus began initial steps to identify and market customer testimonials from highly satisfied program participants. Trade Allies submit contact information to Focus on Energy staff from customers who were highly satisfied with their Program participation. Customers are asked to discuss the positive benefits of participation in the Home Performance Program, which the Program uses to create video testimonials for marketing use on the Program website and social media. Customer testimonials are expected to be released in 2020.

To raise awareness of the Rural Renewables bonus, the Program Implementer increased direct-mail efforts in CY 2019 and used search ads that were geographically targeted to rural zip codes.

In addition to partnering with contractors and Trade Allies, the Program Implementer discussed partnering with other utilities and real estate agents (see *Real Estate Ambassadors* section above). Focus on Energy also shares marketing materials with utilities to co-brand advertisements to further the Program's marketing outreach.

Trade Ally Marketing

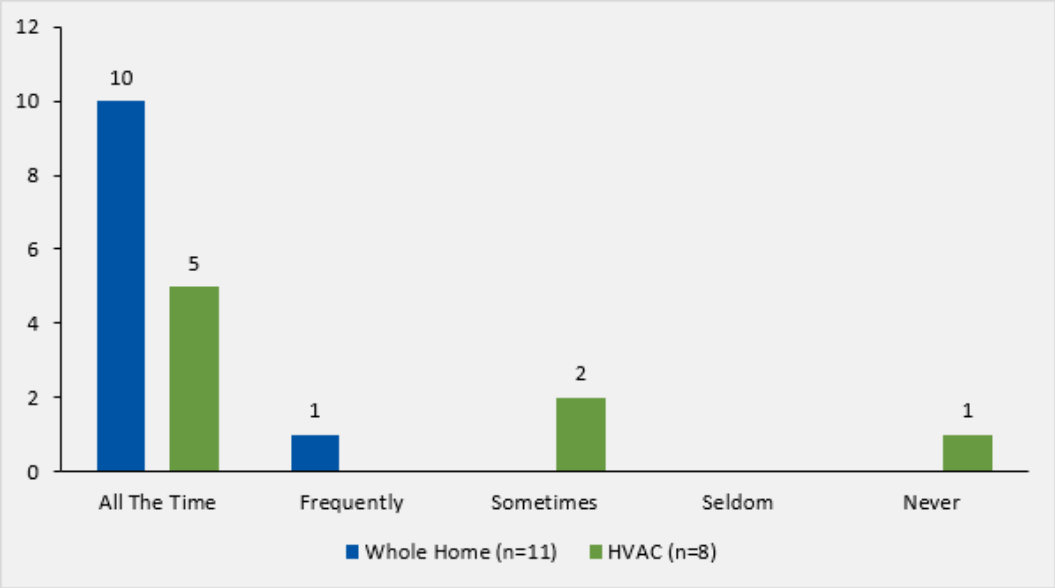
In interviews with the Evaluation Team, Trade Allies provided information about Program marketing and messaging. Of the 11 Whole Home Trade Allies, four promoted the rebate as a main marketing message to customers and three promoted home comfort. Four of eight HVAC Trade Allies said home comfort and bill savings were two of the best marketing tools, while another emphasized company experience and reputation. Five HVAC contractors said they did not use many marketing materials.

Most Trade Allies promoted the Program through their business advertising. Of 11 Whole Home path Trade Allies, 10 said they marketed the Program to customers *all the time,* and one marketed the Program *frequently* through methods like radio and Facebook advertisements. Additionally, four Whole Home respondents said they have used Focus on Energy co-branding in their marketing materials.

Among HVAC path Trade Allies, five (78%) said they advertised the Program *all the time,* two said *sometimes,* and one *never* marketed the Program as a Focus on Energy Program but displayed the incentives as a discount to the customer. This reflects CY 2016 Trade Ally survey results, where 76% (n=54) of Trade Allies said they promoted the Program *all the time.*

Figure 18 shows the frequency of Trade Ally promotion for the Home Performance Program.

Figure 18. How Frequently Trade Allies Promote the Home Performance with ENERGY STAR Program



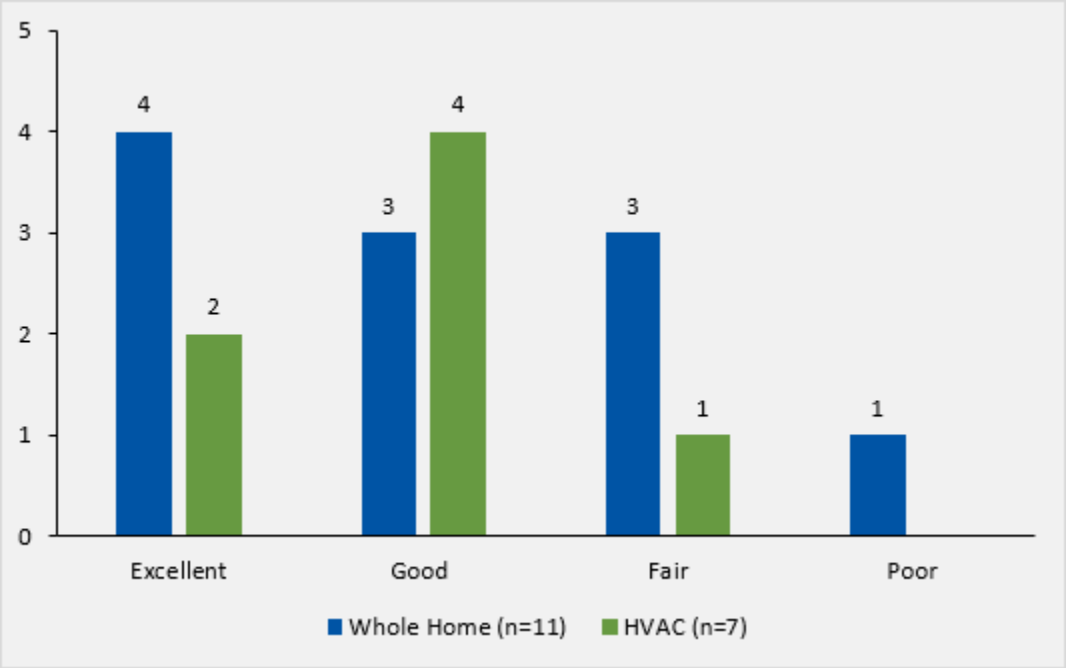
Source: Home Performance Program Trade Ally Interview Question: "How Often Does Your Company Promote the Home Performance Program to Customers?"

The Evaluation Team asked Trade Allies how well they thought Focus on Energy was doing when it comes to providing them with tools and resources to effectively market the Program to their customers. Four Whole Home and two HVAC Trade Allies said Focus on Energy was doing an *excellent* job. Three Whole Home and four HVAC Trade Allies said Focus on Energy was doing a *good* job. Three Whole Home and one HVAC Trade Ally said Focus on Energy was doing a *fair* job.

One Whole Home Trade Ally said Focus on Energy did a *poor* job in this respect, explaining that Focus on Energy was not doing as well as it could to assist in customer uptake and Program participation. This Trade Ally is in a very rural area and believes there is not as much marketing support in this area compared to more urban parts of Wisconsin. One HVAC Trade Ally did not answer the question based on the type of interaction with the Program.

Figure 19 shows Trade Allies' opinions about how Focus on Energy is doing in terms of providing tools and resources so they can effectively market the Program to their customers.

Figure 19. Trade Allies' Opinions on Provided Marketing Tools and Resources



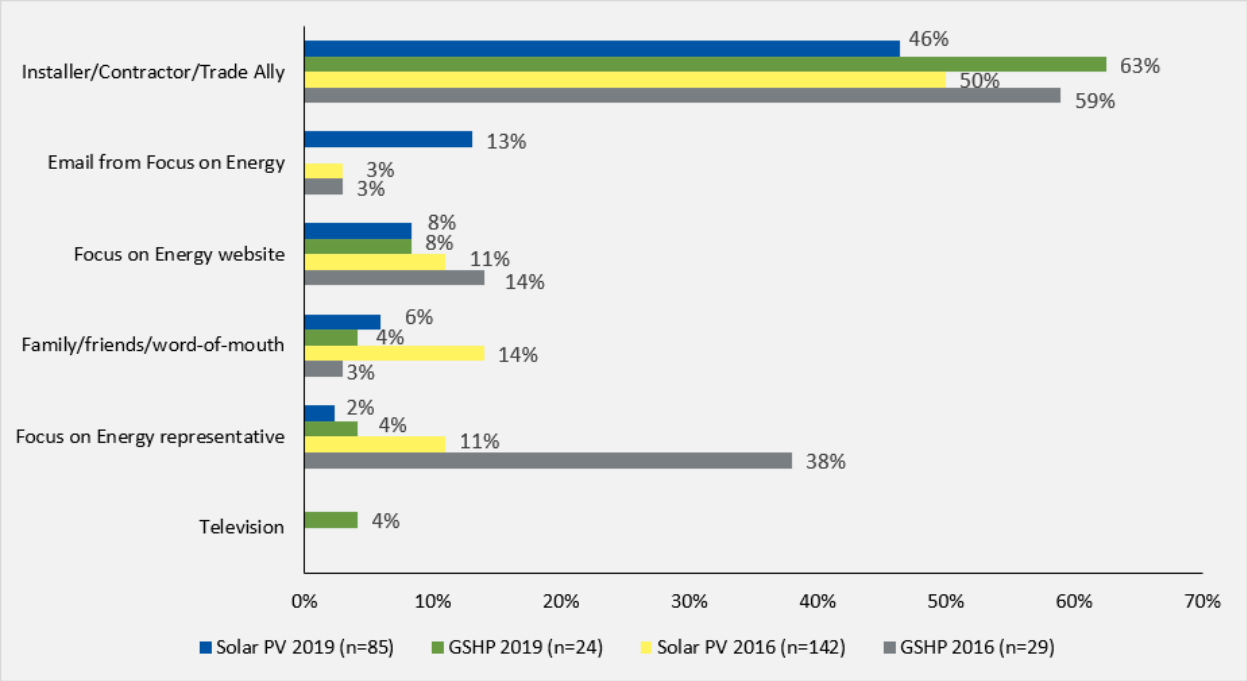
Source: Home Performance Program Trade Ally Interview Question: "How would you say Focus on Energy is doing when it comes to providing you with tools and resources to effectively market programs to your customers?"

Program Awareness

Renewable Energy path participant surveys asked how customers became aware of the Program. Of 109 respondents, 84 installed solar PV and 24 installed a ground-source heat pump. The most common source for information about the Program continued to be a contractor or Trade Ally, according to 46% of solar PV respondents and 63% of GSHP respondents.

Figure 20 shows the most common ways customers learned about the Renewable Energy path by equipment type in CY 2019 and CY 2016. Though responses were generally consistent between CY 2019 and CY 2016, a notable difference was that only 4% of GSHP respondents said they became aware of the Program from a Focus on Energy representative in CY 2019, down from 38% in CY 2016.

Figure 20. Renewable Energy Path Respondents Program Awareness by Equipment Type



Source: Wisconsin Focus on Energy Renewable Energy CY 2019 Participant Survey. B6: Where did you most recently hear about the Focus on Energy's Renewable Rewards Program? (n=109)

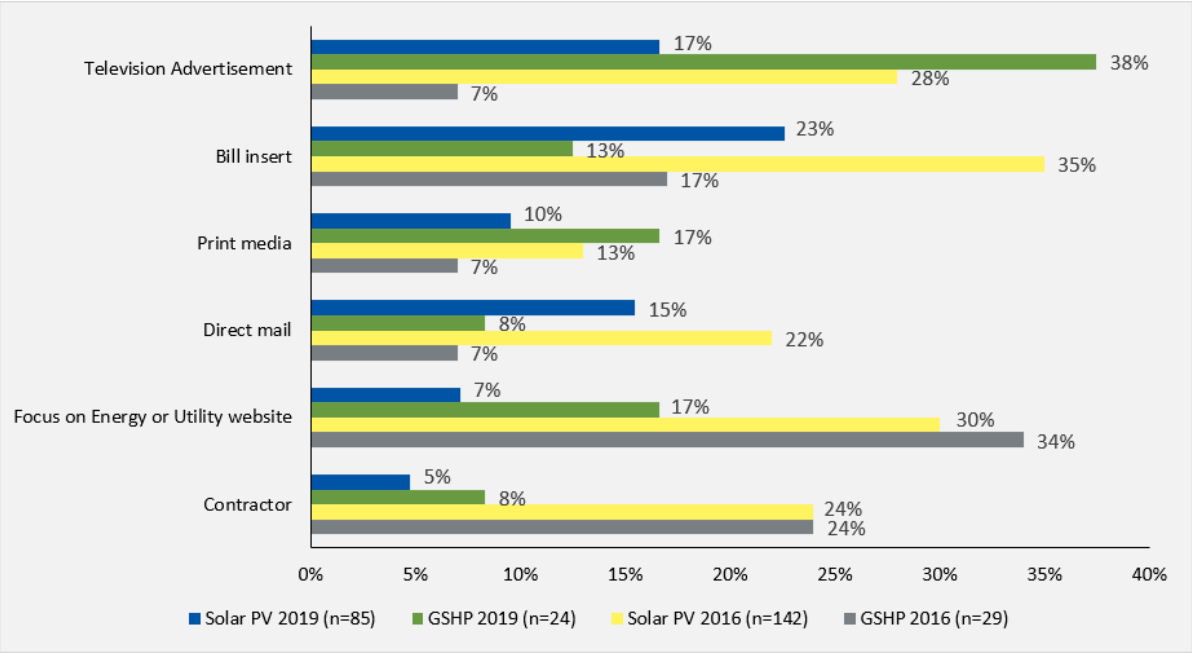
The survey also asked Renewable Energy path participants how Focus on Energy could best keep them informed about energy efficiency programs. Across all 109 respondents, the top two preferred sources of information were television advertisements (21%) and bill inserts (20%). Other top ways customers preferred to be kept informed were direct mailers (14%), social media (12%), print media (11%), and the Focus on Energy or other utility website (9%).

As shown in Figure 21, the top six preferred information sources varied notably by equipment type. Similar to 2016, Solar PV respondents were more likely to prefer bill inserts (23%), television advertisements (17%), and direct mail (15%).

Ground-source heat pump respondents were more likely to prefer television advertisements (38%), print media (17%), and the Focus on Energy website (17%), a decrease from 34% in 2016.

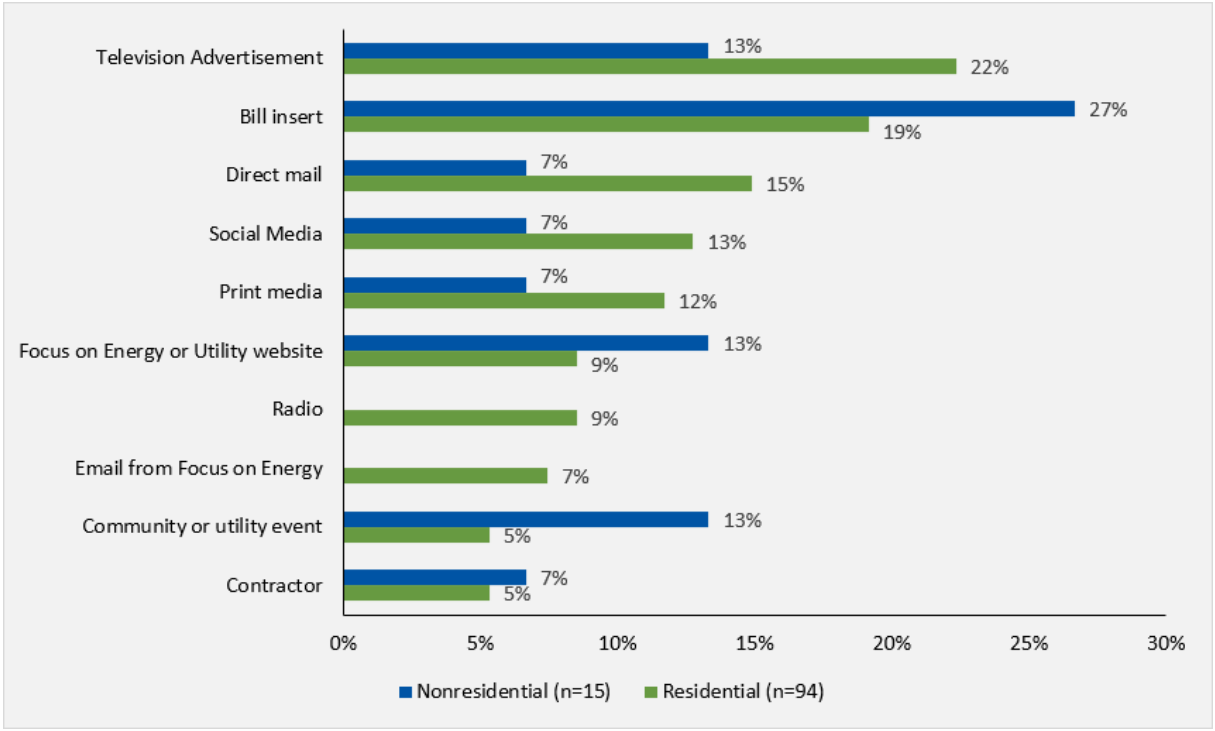
Figure 22 shows awareness preferences by customer type. Nonresidential customers most preferred learning about potential programs from bill inserts, television advertisements, Focus on Energy or utility websites, or a community or utility event. Residential customers were more likely to prefer learning about potential programs through television advertisements, bill inserts, and direct mail. Rural residential responses were similar to residential responses for ways to stay informed.

Figure 21. Renewable Energy Path Respondents Most Preferred Awareness Sources by Equipment Type



Source: Wisconsin Focus on Energy Renewable Energy CY 2019 Participant Survey. B8: What do you think is the best way for Focus on Energy to inform the public about energy efficiency programs? (n=109) Multiple responses allowed.

Figure 22. Renewable Energy Path Respondents Most Preferred Awareness Sources by Customer Type

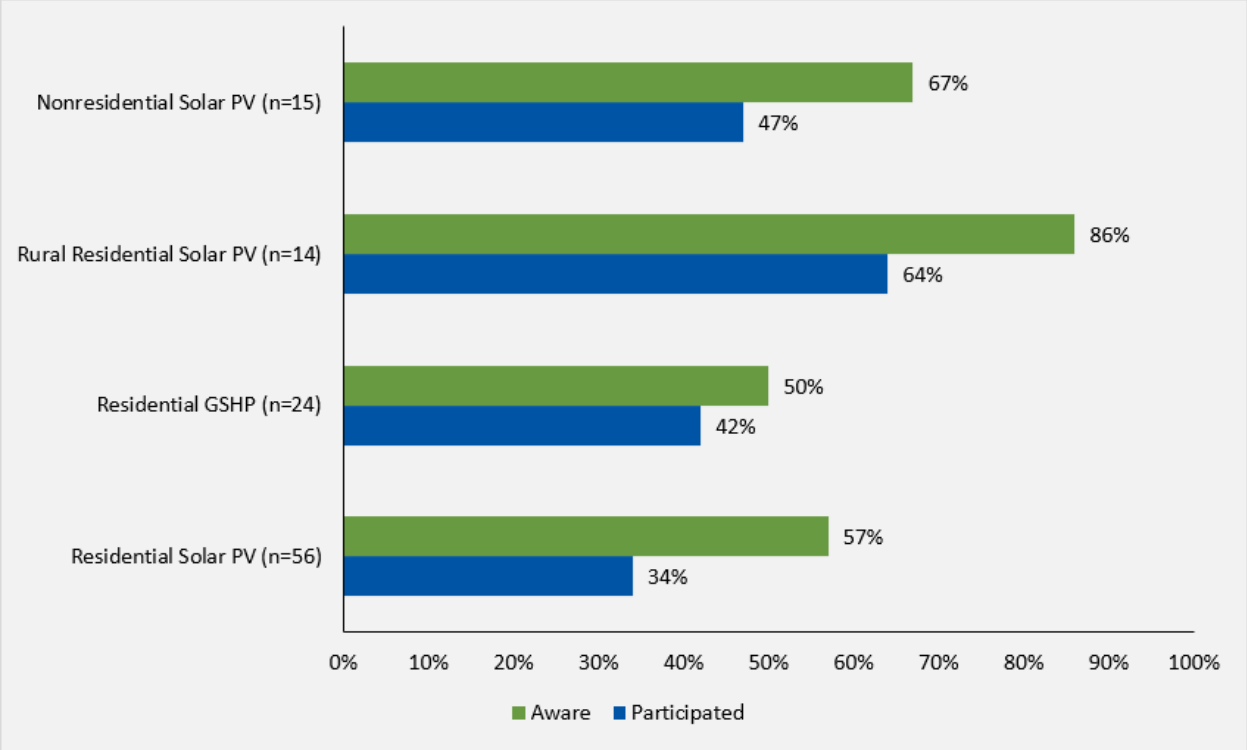


Source: Wisconsin Focus on Energy Renewable Energy CY 2019 Participant Survey. B8: What do you think is the best way for Focus on Energy to inform the public about energy efficiency programs? (n=109) Multiple responses allowed.

Renewable Energy path respondents were asked if they were aware of any other programs or rebates offered by Focus on Energy and if they had participated in any other programs. Overall, 66 respondents (61%) had heard of another program or rebate offered by Focus on Energy, and 45 respondents (41%) had previously participated in one.

Figure 23 shows the percentage of awareness broken out by customer type. Of rural residential respondents, 12 (86%) were aware of another Focus on Energy program and nine (64%) reported participating in one. Ten nonresidential, 32 residential solar PV, and 12 residential GSHP respondents were also aware of another Focus on Energy program, with seven nonresidential, 19 residential solar PV, and 10 residential GSHP respondents participating in another Focus on Energy program.

Figure 23. Awareness and Participation of Another Focus on Energy Program by Customer Type

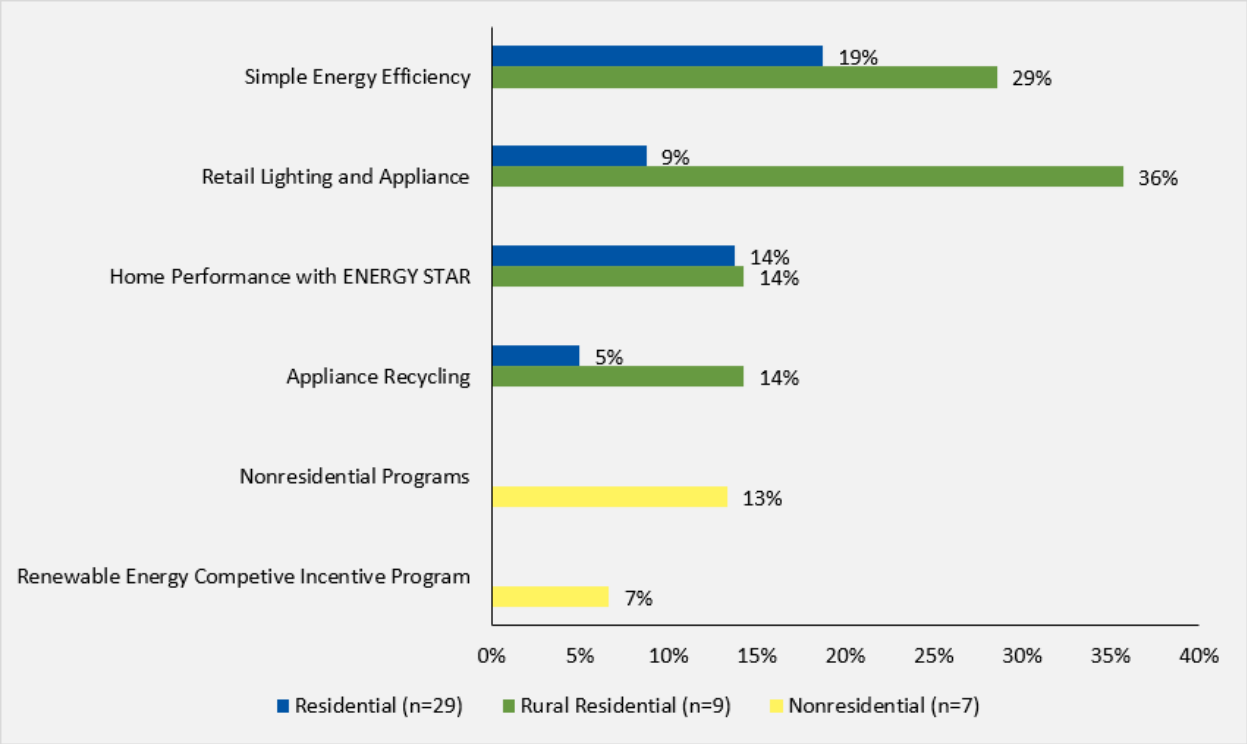


Source: Wisconsin Focus on Energy Renewable Energy CY 2019 Participant Survey. B9: Other than Focus on Energy's Renewable Rewards Program, are you aware of any other Focus on Energy programs or rebates? (n=109)

Figure 24 shows which Focus on Energy programs Renewable Energy path respondents previously participated in, broken out by customer type.

- Nonresidential respondents reported participating in both nonresidential programs and the Renewable Energy Competitive Incentive Program.
- Residential respondents most commonly participated in the Simple Energy Efficiency Program, followed by the Home Performance Program.
- Rural residential customers most commonly participated in the Lighting and Appliance Program, followed by the Simple Energy Efficiency Program.

Figure 24. Renewable Energy Path Respondents Historical Program Participation by Customer Type



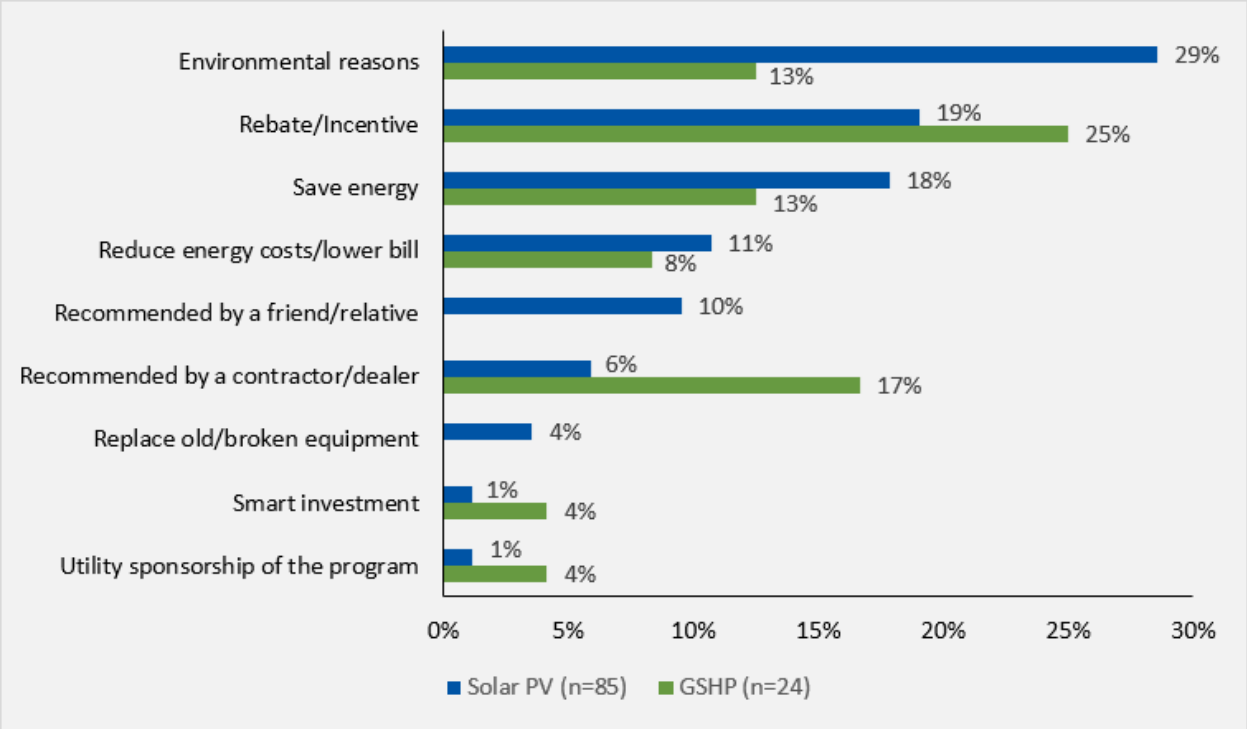
Source: Wisconsin Focus on Energy Renewable Energy CY 2019 Participant Survey. B12: Which [Focus on Energy] programs have you participated in? (n=45) Multiple responses allowed.

Participant Motivation

Renewable Energy survey respondents were asked what their top motivation was to participate in the Program. Though responses varied by customer type, the top responses across all respondents included environmental reasons, the rebate, and saving energy. Other motivations included reducing energy costs and a recommendation by a friend, relative, or contractor.

Twenty-nine percent of solar equipment respondents (n=24) said environmental reasons was their top choice, but one-fourth (n=6) of GSHP equipment respondents selected the rebate as their top motivation to participate in the Renewable Energy path. Figure 25 shows the breakout of respondent motivation by measure.

Figure 25. Renewable Energy Path Respondents Program Motivation by Customer Type



Source: Wisconsin Focus on Energy Renewable Energy CY 2019 Participant Survey. B2: What motivated you to participate in the program? (n=109) Multiple responses allowed.

Customer Experience

This section details the customer experience based on results from the ongoing participation satisfaction survey distributed to all Program participants.

Annual Results from Ongoing Participant Satisfaction Survey

Throughout CY 2019, the Evaluation Team surveyed participants in the Home Performance with ENERGY STAR Program to measure their satisfaction with various aspects of each Program path. Respondents answered questions related to satisfaction and likelihood on a scale of 0 to 10, where 10 indicates the highest degree of satisfaction or likelihood and 0 the lowest.[23]

The following sections provide complete results of these satisfaction surveys by Program path and by quarter for CY 2019 and compares these with previous years.[24]

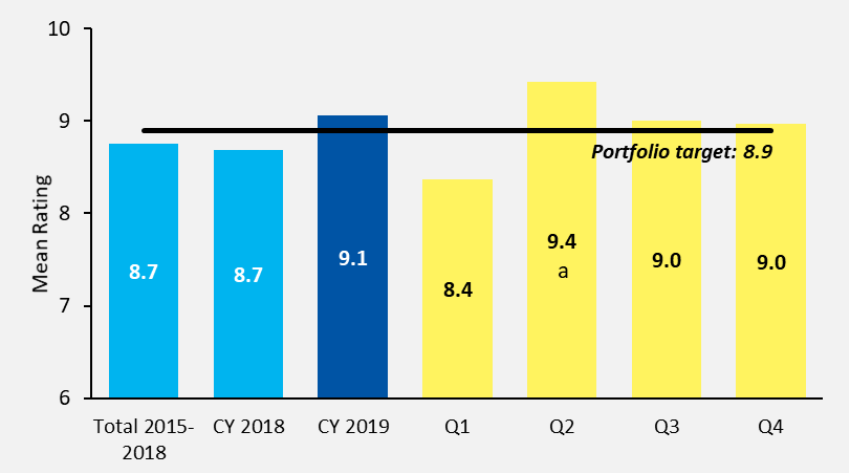
[23] The number of participants who completed a survey does not always match the number of responses for each question, as some participants skipped questions, did not know answers to questions, or did not qualify to answer questions based on previous answers or other known data about the participant.

[24] CY 2019 Renewable Energy path surveys include customers who received the Rural Renewables bonus.

Whole Home Path

Figure 26 shows that whole home participants gave the Home Performance with ENERGY STAR Program an overall satisfaction rating of 9.1 in CY 2019, which was a statistically significant improvement from CY 2018 (8.7).[25] This rating was statistically higher than the portfolio target in Q2, but was equivalent to the target in the other three quarters and for the year overall.[26]

Figure 26. CY 2019 Overall Satisfaction with the Home Performance with ENERGY STAR Program Whole Home Path



Source: Home Performance with ENERGY STAR Whole Home Program Participant Satisfaction Survey Question. "Overall, how satisfied are you with the Program?" (CY 2018 n=250, CY 2019 n=224, Q1 n=11, Q2 n=38, Q3 n=91, Q4 n=65). Total CY 2015-CY 2018 is the participation-weighted average of four annual results.

[a] This result is statistically significantly different from the portfolio target (p<0.10 or better using binomial t-tests).

Table 54 shows the average satisfaction and likelihood ratings for the Whole Home path in CY 2019 and CY 2018. In CY 2019, all these ratings were statistically equivalent to the corresponding CY 2018 ratings.

Table 54. CY 2019 Average Ratings for Home Performance with ENERGY STAR Program Whole Home Path

Item	CY 2018	CY 2019
Satisfaction with Focus on Energy staff	*Not asked*	9.1
Satisfaction with Trade Ally	9.1	8.9
Likelihood of more improvements	5.3	5.6
Likelihood of recommending the Program	9.1	9.3

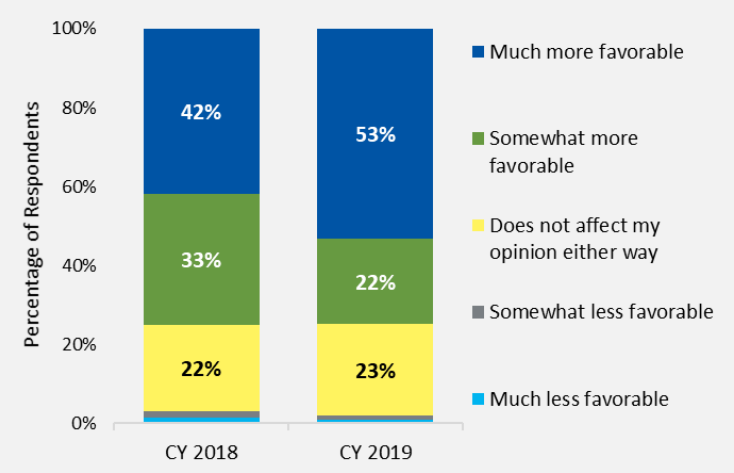
[25] p<0.05 using binomial t-test.

[26] The Program Administrator's contract established a portfolio target of 8.9 to maintain or increase customer satisfaction. The Evaluation Team found that some surveys did not include identifying information to match survey responses to Program participation dates. The Team included survey responses without participation dates in the year-end total but not in the quarterly breakdown.

Using these survey data, the Evaluation Team calculated a Net Promoter Score (NPS) based on customers' likelihood to recommend the Program. The NPS is expressed as an absolute number between -100 and +100 that represents the difference between the percentage of promoters (respondents giving a rating of 9 or 10) and detractors (respondents giving a rating of 0 to 6). The Whole Home path NPS was +78 for CY 2019, which was a small increase from +73 in CY 2018.

CY 2019 Program participants were asked if Focus on Energy offerings affected their opinion of their utilities, and more than half (53%) gave the highest rating of *much more favorable*, representing an increase from CY 2018 (42%; Figure 27). Only 23% said their opinion was not affected, and 2% of survey respondents reported that their opinion of their utility had become less favorable.

Figure 27. CY 2019 Effect of Focus on Energy Offerings on Home Performance with ENERGY STAR Program Whole Home Path Participants' Opinion of Utilities



Source: Home Performance with ENERGY STAR Whole Home Program Participant Satisfaction Survey Question. "Your energy utility partners with Focus on Energy to offer energy efficiency programs to its customers. How have these offerings affected your opinion of your utility, if at all?"
(CY 2018 n=234, CY 2019 n=199)

Program participants were asked to identify the two factors they value most in making purchase decisions (Figure 28). The most frequent response was approval from an expert (44%), followed by deep discounts (40%) and reviews from other customers who purchased the same thing (34%).

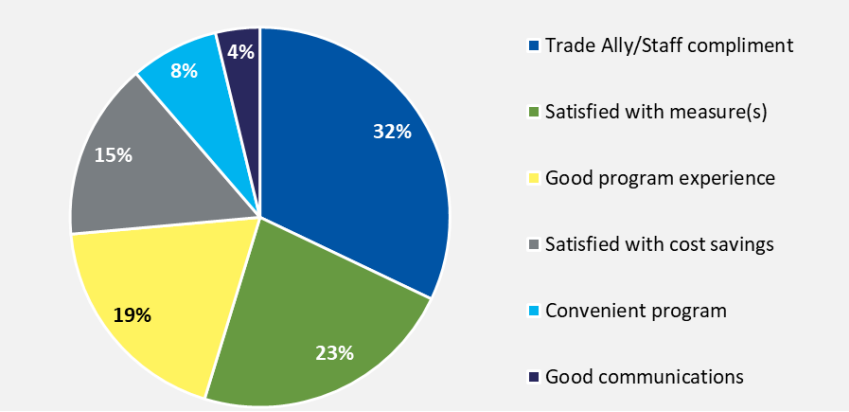
Figure 28. CY 2019 Home Performance with ENERGY STAR Program Whole Home Path Participants' Most Valued Factors in Purchase Decisions

Source: Home Performance with ENERGY STAR Whole Home Program Ongoing Participant Satisfaction Survey Question. "What do you value the most in making a purchase decision (energy efficiency or otherwise)? Choose your top two from the list below." (n=215)

During the customer satisfaction surveys, the Evaluation Team also asked participants if they had any comments or suggestions for improving the Program. Of the 225 participants who responded to the survey, 35% provided open-ended feedback, which the Evaluation Team coded into a total of 98 mentions. Of these mentions, 53 were positive or complimentary comments (54%), and 45 were suggestions for improvement (46%).

The positive responses are shown in Figure 29, with most comments reflecting compliments for Trade Allies and Focus on Energy staff (32%) or satisfaction with the measures installed (23%). In CY 2018, only 7% of positive comments expressed satisfaction with measures installed.

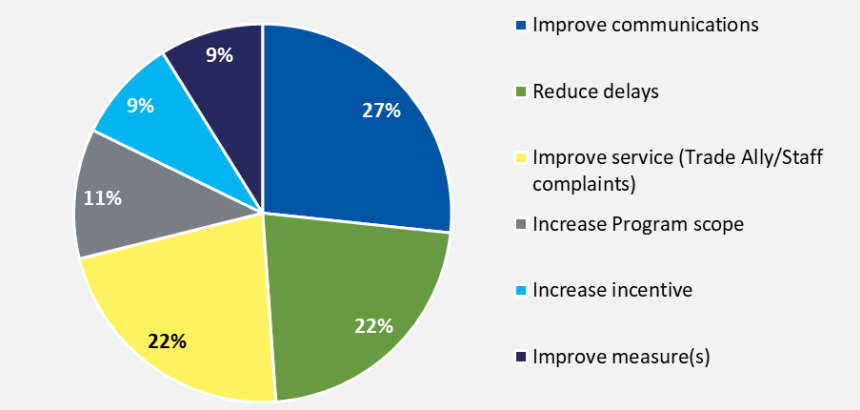
Figure 29. CY 2019 Positive Comments about the Home Performance with ENERGY STAR Program Whole Home Path



Source: Home Performance with ENERGY STAR Whole Home Program Participant Satisfaction Survey Question. "Please tell us more about your experience and any suggestions." (Total positive mentions n=53)

Suggestions for improvement are shown in Figure 30; the most common suggestions were to improve communications (27%), reduce delays (22%), and improve service from Trade Allies or Focus on Energy staff (22%). Compared to CY 2018, there were fewer CY 2019 suggestions about reducing delays (22% down from 35%) and more suggestions about improving service (22% up from 11%). Suggestions about improving communications typically focused on a lack of follow-up after a project was completed or after a rebate application was submitted, which was similar to CY 2018.

Figure 30. CY 2019 Suggestions for Improving the Home Performance with ENERGY STAR Program Whole Home Path



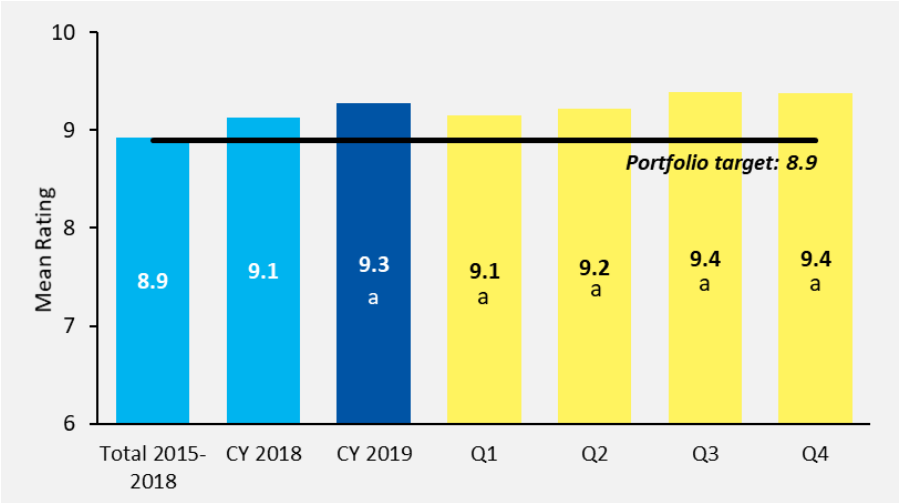
Source: Home Performance with ENERGY STAR Whole Home Program Participant Satisfaction Survey Question. "Please tell us more about your experience and any suggestions."
(Total suggestions for improvement mentions n=45)

HVAC Path

Figure 31 shows the overall satisfaction ratings for the HVAC path, which averaged 9.3 in CY 2019, representing a statistically significant improvement over CY 2018 (9.1). This Program's satisfaction rating was significantly higher than the portfolio target during every quarter of CY 2019 and for the year overall.[27]

[27] The Program Administrator's contract established a portfolio target of 8.9 to maintain or increase customer satisfaction. The Evaluation Team found that some surveys did not include identifying information to match survey responses to Program participation dates. The Team included survey responses without participation dates in the year-end total but not in the quarterly breakdown.

Figure 31. CY 2019 Overall Satisfaction with Home Performance with ENERGY STAR Program HVAC Path



Source: Home Performance with ENERGY STAR HVAC Program Participant Satisfaction Surveys Question. "Overall, how satisfied are you with the Program?" (CY 2018 n=1,035, CY 2019 n=1,405, Q1 n=322, Q2 n=404, Q3 n=363, Q4 n=263). Total CY 2015-CY 2018 is the participation-weighted average of four annual results.

[a] This result is statistically significantly different from the portfolio target ($p<0.05$ or better using binomial t-tests).

Table 55 shows the average satisfaction and likelihood ratings for CY 2019 and CY 2018. In CY 2019, there were significant increases in average satisfaction ratings for Trade Allies (9.5) and the likelihood of recommending the Program (9.4), though there was a significant decrease in the likelihood of making more improvements (5.0).

Table 55. CY 2019 Average Ratings for Home Performance with ENERGY STAR Program HVAC Path

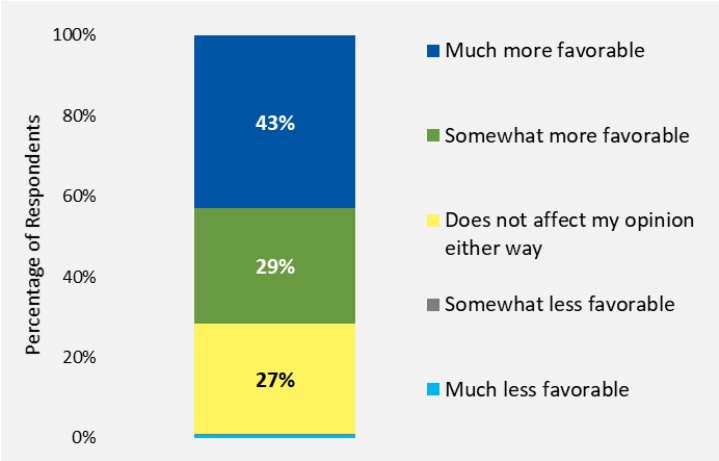
Item	CY 2018	CY 2019
Satisfaction with Focus on Energy staff	*Not asked*	9.3
Satisfaction with Trade Ally	9.4	9.5 [a]
Likelihood of more improvements	5.4	5.0 [a]
Likelihood of recommending the Program	9.2	9.4 [a]

[a] This result is statistically significantly different from the result for CY 2018 ($p<0.05$ using a binomial t-test).

Using these survey data, the Evaluation Team calculated a NPS based on customers' likelihood to recommend the Program. The NPS is expressed as an absolute number between -100 and +100 that represents the difference between the percentage of promoters (respondents giving a rating of 9 or 10) and detractors (respondents giving a rating of 0 to 6). The Home Performance with ENERGY STAR HVAC path's NPS was +82 for CY 2019, which was an increase from CY 2018 (+74) and CY 2017 (+64).

CY 2019 HVAC path participants were asked if Focus on Energy offerings affected their opinion of their utilities, and almost half (43%) gave the highest rating of *much more favorable* (Figure 32). Only 27% said their opinion was not affected, and 1% said their opinion of their utility had become less favorable. These results were very similar to CY 2018.

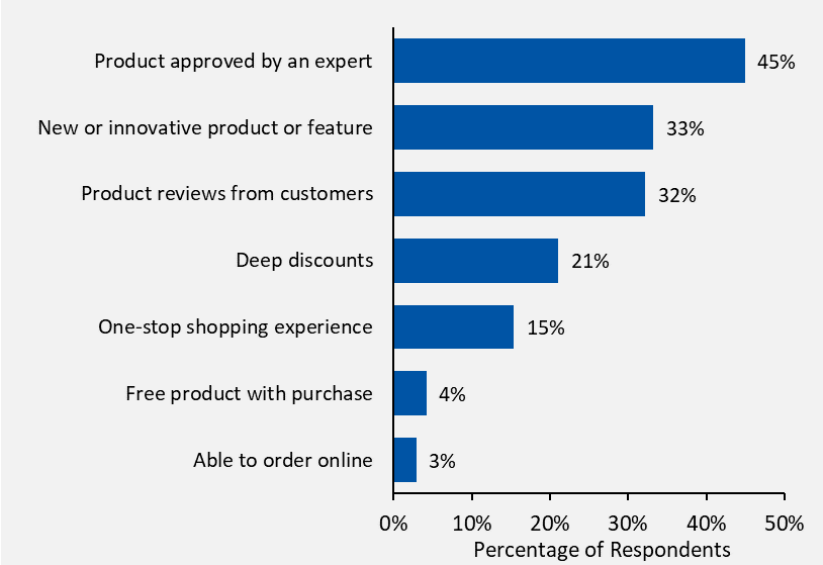
Figure 32. CY 2019 Effect of Focus on Energy Offerings on Home Performance with ENERGY STAR Program HVAC Path Participants' Opinion of Utilities



Source: Home Performance with ENERGY STAR HVAC Program Participant Satisfaction Survey Question. "Your energy utility partners with Focus on Energy to offer energy efficiency programs to its customers. How have these offerings affected your opinion of your utility, if at all?" (n=1,336)

Program participants were asked to identify the two factors they value most in making purchase decisions (Figure 33). The most frequent responses from HVAC path participants were approval from an expert (45%), followed by innovative product features (33%) and reviews from other customers (32%).

Figure 33. CY 2019 Home Performance with ENERGY STAR Program HVAC Path Participants' Most Valued Factors in Purchase Decisions

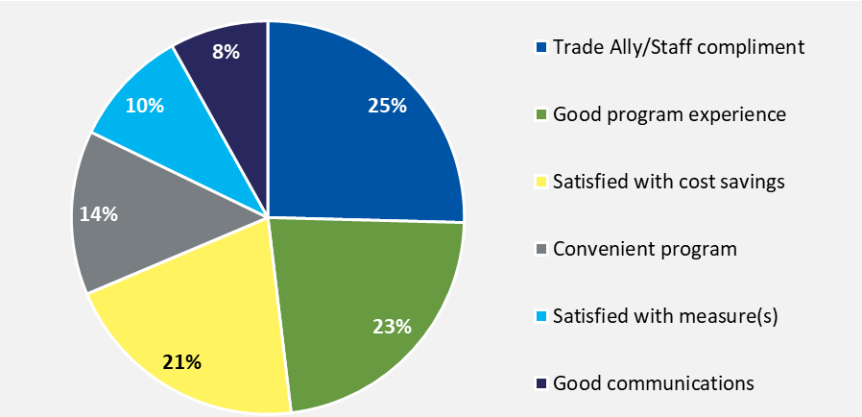


Source: Home Performance with ENERGY STAR HVAC Program Ongoing Participant Satisfaction Survey Question. "What do you value the most in making a purchase decision (energy efficiency or otherwise)? Choose your top two from the list below." (n=1,412)

During the customer satisfaction surveys, the Evaluation Team asked participants if they had any comments or suggestions for improving the Program. Of the 1,428 respondents selected for reporting, 20% provided open-ended feedback, which the Evaluation Team coded into a total of 313 mentions. Of these mentions, 185 were positive or complimentary comments (59%) and 128 were suggestions for improvement (41%).

The positive responses are shown in Figure 34, with 25% complimenting Trade Allies or Focus on Energy staff, 23% reflecting a generally positive experience, and 21% satisfaction with cost savings. These were also the three most frequent categories of positive comments in CY 2018.

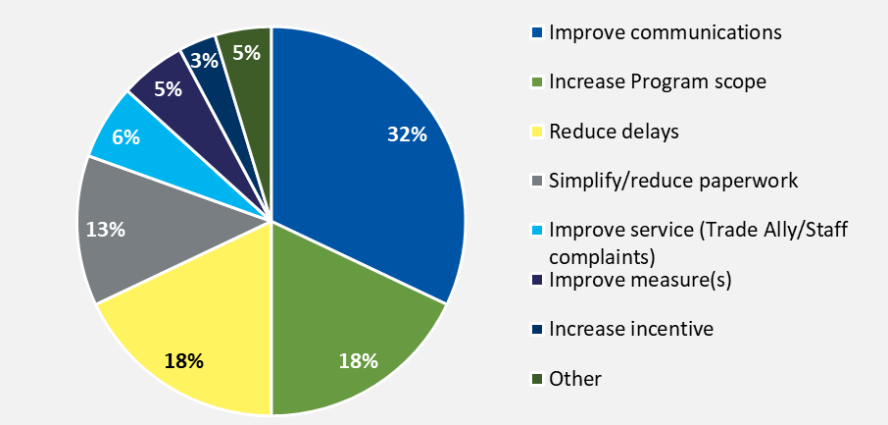
Figure 34. CY 2019 Positive Comments about the Program—HVAC Path



Source: Home Performance with ENERGY STAR HVAC Program Participant Satisfaction Survey Question. "Please tell us more about your experience and any suggestions." (Total positive mentions n=185)

Suggestions for improvement are shown in Figure 35. The three most common suggestions were improving communications (32%), increasing the Program's scope (18%) and reducing delays (18%). Suggestions about improving communications were also the most frequent suggestions in CY 2018, and as in the previous year these comments related to miscommunications about incentive amounts, not being able to track rebate status, and increasing promotion for the Program. Compared to CY 2018, more CY 2019 respondents suggested reducing delays (18% up from 10%) and fewer mentioned increasing incentives (3% down from 16%).

Figure 35. CY 2019 Suggestions for Improving the Program—HVAC Path

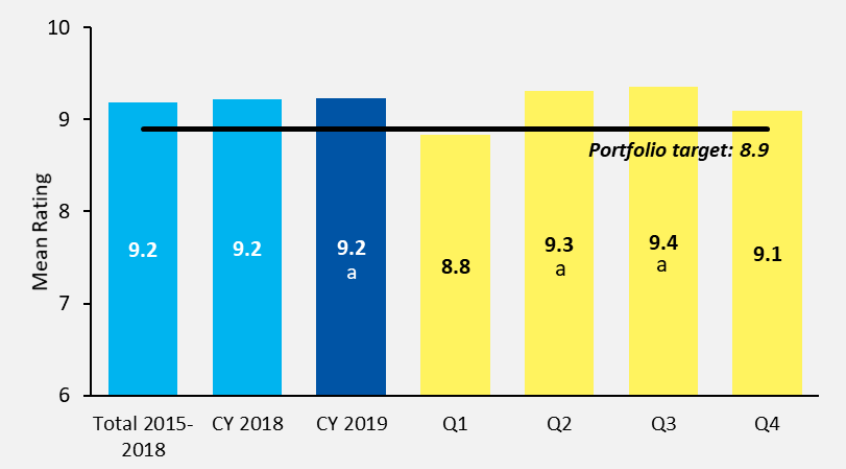


Source: Home Performance with ENERGY STAR HVAC Program Participant Satisfaction Survey Question. "Please tell us more about your experience and any suggestions." (Total suggestions for improvement mentions n=128)

Renewable Energy Path

Figure 36 shows that the average overall satisfaction rating among CY 2019 Renewable Energy path participants was 9.2, which was statistically unchanged from CY 2018 (9.2). This path's average satisfaction rating was significantly above the portfolio target of 8.9 in Q2, Q3, and for CY 2019 overall, and was equivalent to the target in Q1 and Q4.[28]

Figure 36. CY 2019 Overall Satisfaction with the Program—Renewable Energy Path



Source: Renewable Energy Participant Satisfaction Survey Question. "Overall, how satisfied are you with the Program?" (CY 2018 n=216, CY 2019 n=225, Q1 n=12, Q2 n=52, Q3 n=65, Q4 n=72). Total CY 2015-CY 2018 is the participation-weighted average of three annual results (this Program and its survey began in CY 2016).

[a] This result is statistically significantly different from the portfolio baseline ($p<0.10$ or better using binomial t-tests).

[28] The Program Administrator's contract established a portfolio target of 8.9 to maintain or increase customer satisfaction. The Evaluation Team found that some surveys did not include identifying information to match survey responses to Program participation dates. The Team included survey responses without participation dates in the year-end total but not in the quarterly breakdown.

Table 56 shows the average satisfaction and likelihood ratings for CY 2019 and CY 2018. In CY 2019, all these ratings were statistically equivalent to the corresponding ratings from the previous year.

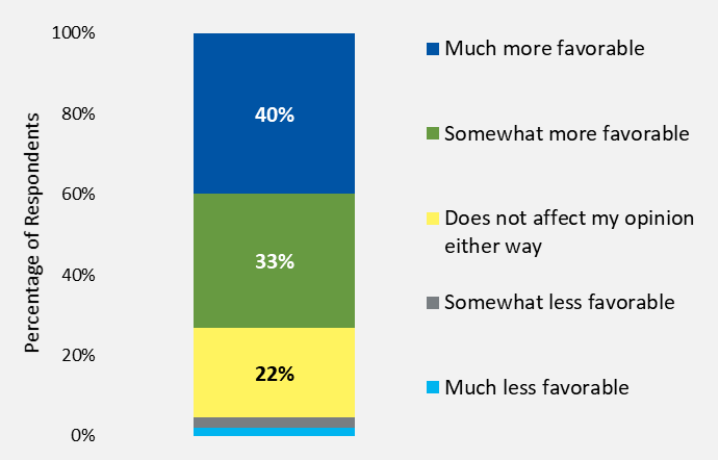
Table 56. CY 2019 Average Ratings for the Program—Renewable Energy Path

Item	CY 2018	CY 2019
Satisfaction with Focus on Energy staff	*Not asked*	8.7
Satisfaction with Trade Ally	9.0	9.1
Likelihood of more improvements	5.5	5.8
Likelihood of recommending the Program	9.5	9.4

Using these survey data, the Evaluation Team calculated a NPS based on customers' likelihood to recommend the Program. The NPS is expressed as an absolute number between -100 and +100 that represents the difference between the percentage of promoters (respondents giving a rating of 9 or 10) and detractors (respondents giving a rating of 0 to 6). The Home Performance with ENERGY STAR Program NPS rating among CY 2019 Renewable Energy path participants was +83, consistent with this path's NPS of +84 in CY 2018.

CY 2019 Program participants were asked if Focus on Energy offerings affected their opinion of their utilities, and 40% gave the highest rating of *much more favorable* (Figure 37). Only 22% said their opinion was not affected, and 5% of survey respondents reported that their opinion of their utility had become less favorable.

Figure 37. CY 2019 Effect of Focus on Energy Offerings on Renewable Energy Path Participants' Opinion of Utilities



Source: Renewable Energy Participant Satisfaction Survey Question. "Your energy utility partners with Focus on Energy to offer energy efficiency programs to its customers. How have these offerings affected your opinion of your utility, if at all?" (n=213)

Program participants were asked to identify the two factors they value most in making purchase decisions (Figure 38). The most frequent response was innovative products or features (42%), followed by reviews from other customers who purchased the same thing (34%), approval from an expert (32%) and deep discounts (31%).

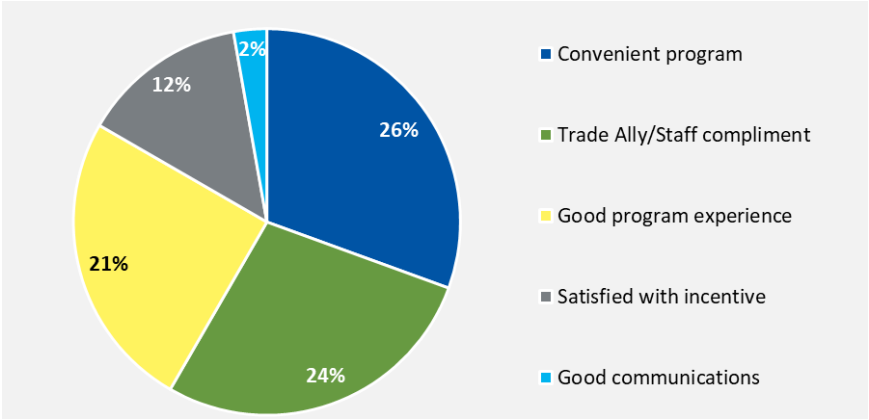
Figure 38. CY 2019 Renewable Energy Path Participants' Most Valued Factors in Purchase Decisions

Source: Renewable Energy Ongoing Participant Satisfaction Survey Question. "What do you value the most in making a purchase decision (energy efficiency or otherwise)? Choose your top two from the list below." (n=214)

During the customer satisfaction surveys, the Evaluation Team asked participants if they had any comments or suggestions for improving the Program. Of the 225 Renewable Energy path participants who responded to the survey, 31% provided open-ended feedback, which the Evaluation Team coded into a total of 81 mentions. Of these, 42 were positive or complimentary comments (52%), and 39 were suggestions for improvement (48%).

The positive responses are shown in Figure 39, with 26% commenting on the Program's convenience and 24% complimenting Trade Allies or Program staff.

Figure 39. CY 2019 Positive Comments about the Renewable Energy Path

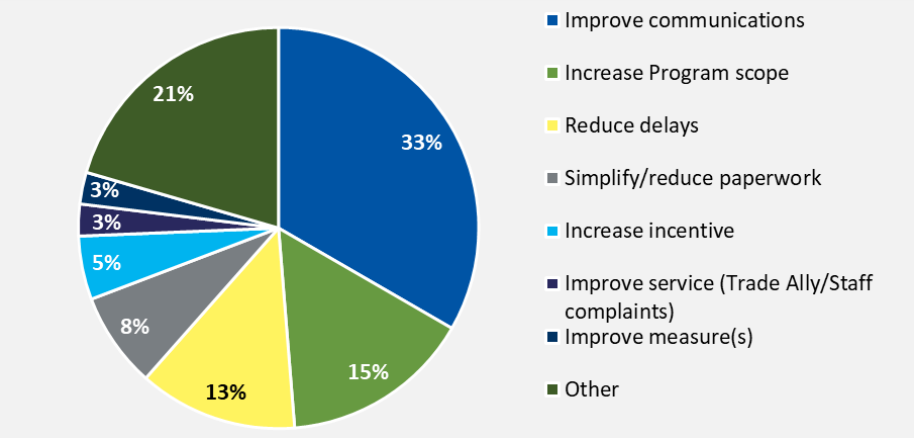


Source: Renewable Energy Customer Satisfaction Survey Question. "Please tell us more about your experience and any suggestions." (Total positive mentions n=42)

Suggestions for improving the Program are shown in Figure 40. The most common suggestions involved improving communications about the Program (33%), which was also the most common response in CY 2018 (29%). These suggestions related to miscommunications about incentive amounts, not being

able to track rebate status, and increasing promotion for the Program. A substantial portion of suggestions from Renewable Energy path respondents were categorized as "other" miscellaneous comments (21%); most of these suggestions related to utilities' adoption of renewable energy and their billing policies for customers with solar power.

Figure 40. CY 2019 Suggestions for Improving the Renewable Energy Path



Source: Renewable Energy Customer Satisfaction Survey Question. "Please tell us more about your experience and any suggestions." (Total suggestions for improvement mentions n=39)

Trade Ally Experience

The Evaluation Team conducted in-depth interviews with 11 Whole Home and eight HVAC Trade Allies to understand how Trade Allies are interacting with the Program. The Evaluation Team sought to learn what aspects of the Program are working well for Trade Allies and identify possible areas of improvement. The Evaluation Team focused on two specific areas of Trade Ally-Program interaction: satisfaction and customer experience.

Recruitment and Satisfaction

Seven Whole Home Trade Allies and four HVAC Trade Allies have been participating contractors for five or more years. Trade Allies who had been participating contractors for less than five years were asked about their motivation for joining the Program. All four new Whole Home Trade Allies said their motivation for joining the Program was to expand their business and stay competitive with other businesses, and three additionally said it was to help the customer get the rebate. Two new HVAC Trade Allies said helping their customers with a rebate and increasing business through the Program seemed like a win-win situation. Two other HVAC Trade Allies said their main motivations were to help their customers, increase their business, and stay competitive.

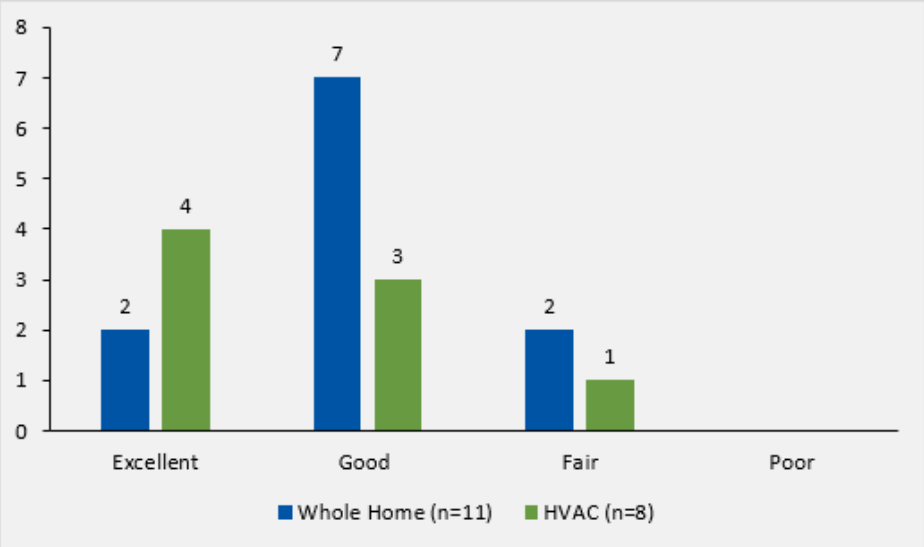
Ten Whole Home Trade Allies offer an instant rebate to their customers, but one requires customers to apply for the rebate through Focus on Energy. Two Trade Allies allow customers to apply for the rebate themselves, based on their needs and preferences. The other six HVAC Trade Allies require their customers to apply for the rebate through Focus on Energy. One HVAC Trade Ally fills out most applications for the customers but has customers submit their own applications.

The Evaluation Team asked Trade Allies to rate Focus on Energy as *excellent*, *good*, *fair*, or *poor* on certain components of Program implementation. Trade Allies were asked to rate how effective the Program was at the following:

- Reaching out to you and keeping you informed about programs and offerings
- Making the paperwork easy to submit
- Providing you with tools and resources to effectively market programs to your customers
- Providing educational opportunities or training resources
- Providing the right amount of support so you can confidently sell and install energy efficiency equipment

Figure 41 shows that most Trade Allies reported that the Program was doing a *good* or *excellent* job with outreach and sharing Program updates. Two Whole Home and one HVAC Trade Ally rated Program communication as *fair*. One Whole Home Trade Ally who rated outreach and Program notifications as *fair* reported that communications have "been a consistent issue" and mentioned issues with staying informed with both residential and commercial incentive changes. Another HVAC Trade Ally said process changes are more frequent than the communication of those changes. This Trade Ally mentioned specifically issues regarding understanding the online application process and said a lot of little changes within the Program can have a big impact on the business.

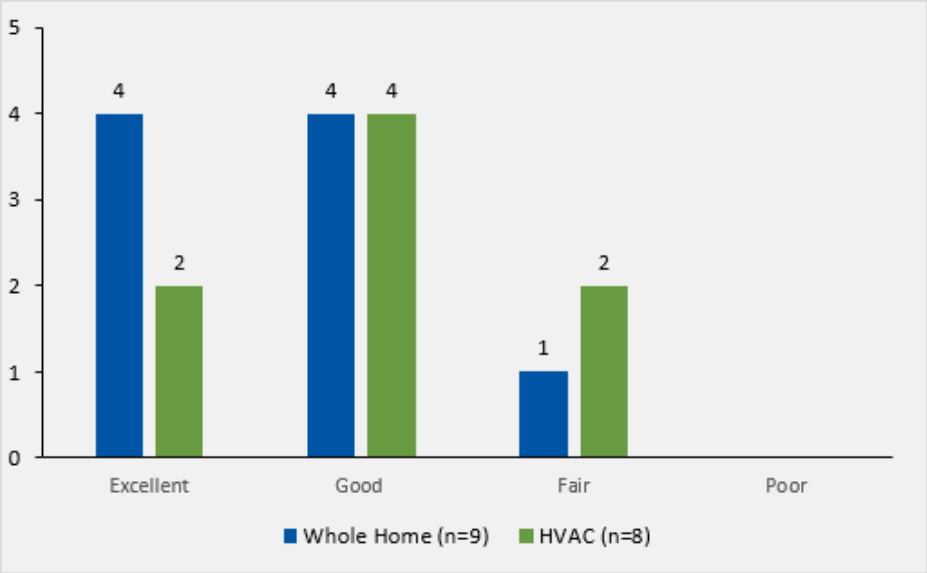
Figure 41. Trade Ally Opinion on Outreach and Program Notifications from Focus on Energy



Source: Home Performance Program Trade Ally Interview Question: "How would you say Focus on Energy is doing when it comes to reaching out to you and keeping you informed about programs and offerings?"

When asked if Focus on Energy made it easy to submit paperwork, most Trade Allies said Focus on Energy was doing an *excellent* or *good* job, as shown in Figure 42. One Whole Home Trade and two HVAC Trade Allies said Focus on Energy was doing a *fair* job. They would like the Program to streamline the paperwork process and make the process easier overall. Two Whole Home Trade Allies did not answer because the question did not apply to them based on how they interact with the Program.

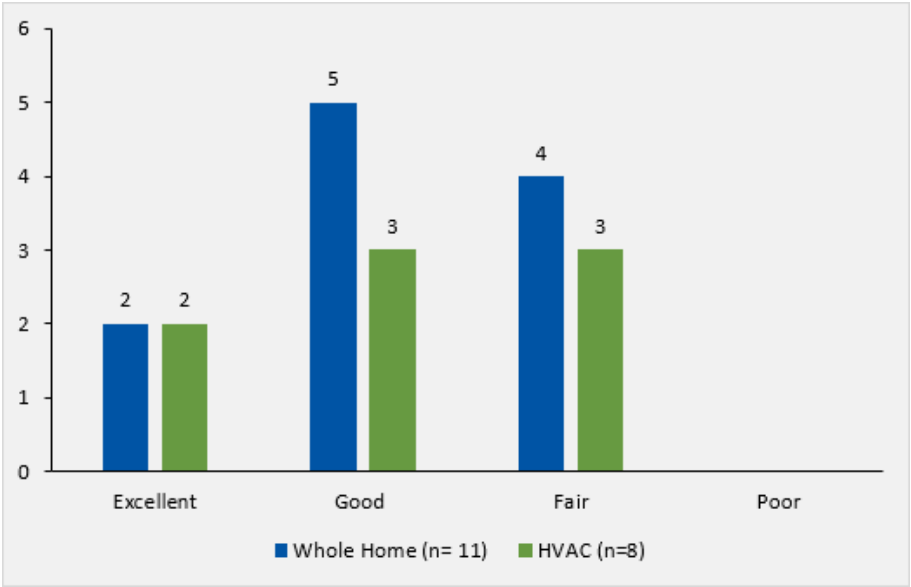
Figure 42. Trade Ally Opinion on Ease of Submitting Paperwork



Source: Home Performance Program Trade Ally Interview Question: "How would you say Focus on Energy is doing when it comes to making the paperwork easy to submit?"

Figure 43 shows Trade Ally opinion about how well Focus on Energy provides educational opportunities or training resources. Twelve Trade Allies said Focus on Energy did an *excellent* or *good* job on education and training. Seven thought Focus was doing a *fair* job, and one suggested it "could offer more online trainings and put together some PowerPoints for my team so we can go at our own pace." Four of the Trade Allies are located in rural areas and expressed similar thoughts because training opportunities are often offered far from their business location.

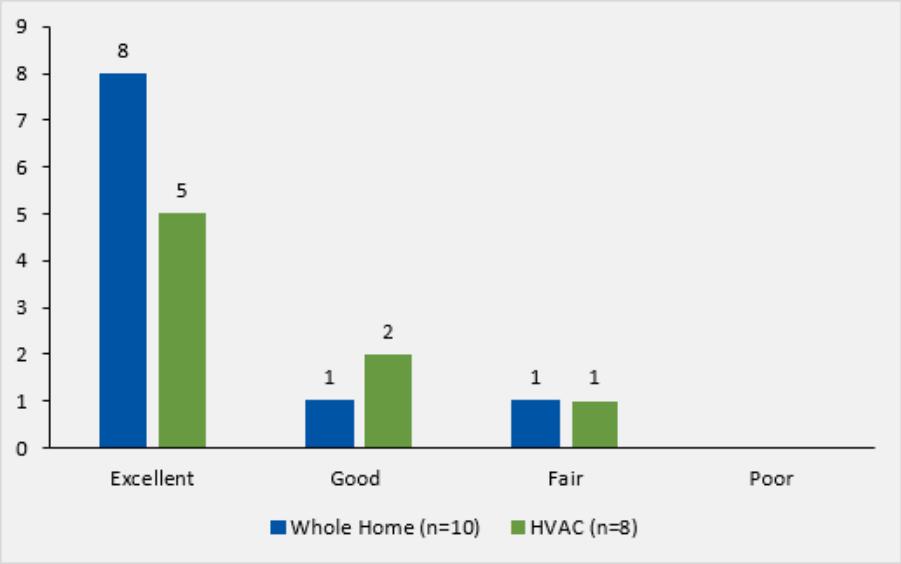
Figure 43. Trade Ally Opinion on Education and Training Resources



Source: Home Performance Program Trade Ally Interview Question: "How would you say Focus on Energy is doing when it comes to providing educational opportunities or training resources?"

The Evaluation Team also asked Trade Allies if Focus on Energy gave the right amount of support so they could confidently sell and install energy efficiency equipment. Thirteen of the Trade Allies interviewed said Focus on Energy was doing an *excellent* or *good* job, as shown in Figure 44. One Whole Home and one HVAC Trade Ally said Focus on Energy was doing a *fair* job. This HVAC Trade Ally mentioned that outreach and engagement felt limited; he only remembered meeting with his regional representative once. The Whole Home Trade Ally discussed issues with marketing to customers in areas that Focus on Energy marketing does not cover (along the mid-western border).

Figure 44. Trade Ally Opinion on Support Provided by Focus on Energy



Source: Home Performance Program Trade Ally Interview Question: "How would you say Focus on Energy is doing when it comes to providing the right amount of support so you can confidently sell and install energy efficiency equipment?"

The Evaluation Team asked about the recent Program design change from a tiered structure to a prescriptive rebate design. All of the Whole Home Trade Allies said they were well informed and given adequate advanced notice of the prescriptive changes before they took place. Seven of 11 Whole Home Trade Allies reacted positively to the new Program design and implementation; none expressed dissatisfaction with the Program change. The other four Trade Allies said the Program changes had a neutral effect on their business.

As discussed in the *Program Changes* section, one Trade Ally was concerned that prescriptive rebates are not tied to savings but rather to participation in more desired measures, such as duct sealing, which could translate to lower kWh per dollar savings for the home overall. Because of the low incentive, this Trade Ally thought customers might be less likely to install measures such as duct sealing and insulation that would help them save energy. Another Trade Ally said the change to prescriptive rebates makes it harder to bundle measures to customers. This Trade Ally pointed out that having a "menu approach" of incentives makes it easier for customers to install fewer measures and could hurt sales and potential customer savings.

Whole Home Trade Allies provided multiple suggestions of how the Program could help their businesses. Several mentioned adding online training resources for rural Trade Allies who are unable to travel to training and more online support for rebate applications. Others suggested lower rebate requirements for attic insulation and other measures so customers who are in need of improvements but who do not currently qualify can participate and get a rebate. One Trade Ally specifically noted completing attic insulation jobs that did not qualify for the rebate but that created savings for the customer. Another complained about frequent Program changes, wishing that the Program was more stable from year to year and that more stability would benefit both Trade Allies and customers.

HVAC Trade Allies offered similar suggestions for improvements. One wanted better communication about Program changes so it would be easier to explain the changes to customers. Other suggestions included more in-person or direct communication with Trade Allies as well as raising incentive amounts or at least not lowering the existing amounts.

Program Barriers

Ten Whole Home Trade Allies have been in the Program for many years and were unable to identify any current barriers to participation. One Trade Ally who joined within that last three years said there is a learning curve when first joining, and another said the invoicing process took longer than expected. Another Trade Ally agreed it took time to adjust to the length of incentive processing and to the application process and availability of incentives. HVAC Trade Allies cited many of the same barriers, noting a learning curve for understanding available incentives, application forms, and online tools.

The Evaluation Team asked Trade Allies about their customers' experiences with the Home Performance Program. One Whole Home Trade Ally who joined in 2019 said no customer had ever declined the opportunity to participate. The other Whole Home Trade Allies reported that while most of their customers participate in the Program, the largest participation barrier is the perception that improvement costs are too expensive.

Other barriers to participation included customers, specifically elderly customers, who did not think the improvements were worth their investment because they might not stay in the home much longer or were worried they would not receive their return on investment given the amount of time they planned to stay in the home.

HVAC Trade Allies reported similar barriers for their customers, specifically noting that elderly customers were often more averse than other demographics to energy-efficient options and more worried about return on investment. Other reported barriers were that some customers just wanted the cheapest equipment option while others did not want to deal with participating in the Program.

One Trade Ally mentioned working on only a few Tier 2 projects because most customers who qualify could not afford to make upgrades even with the higher incentives. A second Trade Ally stated that an additional barrier to Tier 2 customers is their having to pay full price for the energy assessment and that this may be a barrier for some customers.

To mitigate participation barriers, most Trade Allies suggested more marketing efforts, especially in rural areas, and higher rebate amounts. Whole Home Trade Allies did not suggest other Program improvements; however, as noted earlier, one mentioned wanting more stability and that too many changes in the Program could be burdensome.

Among HVAC Trade Allies, suggestions for improvement included more resources for Tier 2 participants, more Trade Ally training opportunities either online or as recorded video uploaded after in-person training, more frequent updates about the Program or incentives when they are modified, and better communication from Focus on Energy for both customers and Trade Allies. One Trade Ally suggested implementing a bonus system for number of jobs completed and upon reaching a specific level of satisfaction among those jobs. Another Trade Ally said streamlining the application process and removing redundancies would be an improvement.

Program Cost-Effectiveness

Evaluators commonly use cost-effectiveness tests to compare the benefits and costs of a DSM offering. The benefit/cost test used in Wisconsin is a modified version of the total resource cost (TRC) test. *Appendix F* includes a description of the TRC test.

Table 57 lists the CY 2019 incentive costs for the Home Performance with ENERGY STAR Program.

Table 57. Home Performance with ENERGY STAR Program Incentive Costs

	CY 2019
Incentive Costs	$8,955,491

The Evaluation Team found that the CY 2019 Home Performance with ENERGY STAR Program was not cost-effective (0.97), but was very close. Table 58 lists the evaluated costs and benefits.

Table 58. Home Performance with ENERGY STAR Program Costs and Benefits

Cost and Benefit Category	CY 2019
Costs	
Administration Costs	216,196.10
Delivery Costs	$3,391,170
Incremental Measure Costs	$45,997,774
Total Non-Incentive Costs	**$49,605,140**
Benefits	
Electric Benefits (kWh)	$13,845,668
Electric Benefits (kW)	$14,541,115
Gas Benefits	$13,525,323
Emissions Benefits	$6,027,423
Total TRC Benefits	**$47,939,528**
Net TRC Benefits	**($1,665,611)**
TRC B/C Ratio	**0.97**

Evaluation Outcomes and Recommendations

The Evaluation Team compiled the following outcomes and recommendations to improve the Home Performance with ENERGY STAR Program.

Outcome 1: Limited education and awareness about HVAC tune-ups may have contributed to low tune-up voucher usage distributed by Real Estate Ambassadors to new homeowners. The Program Administrator and Program Implementer said the Real Estate Ambassador effort grew within the past year to the point they reduced efforts to recruit ambassadors. Although the Program Implementer reported a significant share of website views from the Ambassador welcome kits, which suggests positive customer engagement, Program staff reported lower than expected redemption of the HVAC tune-up vouchers included in the welcome packet. The Program Implementer said customers may not know what an HVAC tune-up is and that the voucher provides no information to explain how a tune-up could save energy.

Recommendation 1: Consider including text on the voucher to explain the reason for getting an HVAC tune-up, the potential annual bill savings, and when is the best time of year to get a tune-up.

Outcome 2: Whole Home and HVAC Trade Allies located in rural areas expressed the desire for better and more specific marketing. Trade Allies were mostly satisfied with marketing efforts in general; however, some expressed interest in different Program marketing tactics in their areas. Rural-area Trade Allies thought metro or urban area Trade Allies received a greater benefit from Program marketing that did not extend into rural areas or areas close to the western border of Wisconsin. Non-rural Trade Allies mentioned increasing the use of general marketing campaigns on television and radio as well as creating and posting informative videos on social media sites such as Facebook and YouTube.

Recommendation 2: Consider extending the marketing and outreach strategies that customers have expressed interest in to learn about Program opportunities (i.e., television advertisements or print media) and that Trade Allies in rural areas can use to attract more customer attention.

Recommendation 3: Investigate creating more video content for social media sites that explains how the Home Performance Program paths work and demonstrates the blower door test and comprehensive walk-through of the home to show the potential benefits of Program participation. The Evaluation Team supports the Program's efforts to post video testimonials on the Focus on Energy website.

Outcome 3: Trade Allies would benefit from more accessible training opportunities. Trade Allies were generally satisfied with training opportunities offered through the Program. However, rural Trade Allies explained that it is very difficult for them to attend trainings when they have to travel long distances, and other Trade Allies explained that they sometimes cannot attend trainings because of their heavy workload or emergency appointments.

Recommendation 4: Consider expanding online resources for Trade Allies to include easily accessible online versions of current training. By doing this, all Trade Allies can access resources for their businesses and ensure that all Program participants have an equal opportunity to expand their knowledge.

Outcome 4: Trade Allies noted that concern about return on investment was a large barrier for certain demographic populations, such as the elderly and people who were not staying in their home long-term. Trade Allies said elderly customers and customers who would not be in the home long were reluctant to participate in the Home Performance Program and to spend the money required for energy-efficient upgrades because they worried about the lasting value of their purchase. Trade Allies said these potential customers recognized the long-term savings but did not understand the immediate benefits of increased comfort or energy and bill savings from installing new energy-efficiency equipment through the Program.

Recommendation 5: Consider expanding marketing and educational tools that already emphasize home comfort and energy bill savings to demonstrate the immediate benefits of Home Performance Program participation.

Outcome 5: Deemed savings for GSHPs do not accurately reflect system-specific savings. *Ex ante* GSHP savings reflected deemed savings from the TRM, which are based on average assumptions about GSHP systems and site locations. The Evaluation Team calculated verified savings by applying project-specific inputs to the TRM algorithm. The Team found that deemed *ex ante* savings may under- or overstate GSHP savings based on the location and performance specifications of the rebated GSHP system.

Recommendation 6: Improve the accuracy of *ex ante* savings estimates by using system-specific performance inputs and representative installation locations. Calculate project-specific GSHP energy and demand savings using algorithms provided in the TRM and regional equivalent full load hour estimates for heating and cooling, paired with system-specific capacities and efficiencies listed on the AHRI certificate.

Multifamily Energy Savings Program

Through the Multifamily Energy Savings Program, Focus on Energy provides multifamily property owners and managers with education and incentives for energy-efficient upgrades. Focus on Energy offers two reward types through the Multifamily Energy Savings Program: prescriptive incentives for eligible measures, typically installed under standardized building operating conditions, and custom incentives for projects with unique or varying performance.

In CY 2019, Focus on Energy consolidated the Multifamily Energy Savings and Multifamily New Construction offerings into one program. Property owners, managers, and developers of multifamily new construction and retrofit projects are eligible for incentives through the Multifamily Energy Savings Program.

In CY 2019, APTIM, as the Program Administrator, continued to administer the Multifamily Energy Savings Program, with Franklin Energy as the Program Implementer.

Project leads are typically generated by the Program Implementer. For new construction, project leads may also be routed to the Multifamily Energy Savings Program from the Design Assistance Program if projects or measures arise after completion of the building design phase or if funds from the Design Assistance Program have been exhausted.

Table 59 lists actual spending, savings, participation, and cost-effectiveness for the Multifamily Energy Savings Program.

Table 59. Multifamily Energy Savings Program Summary

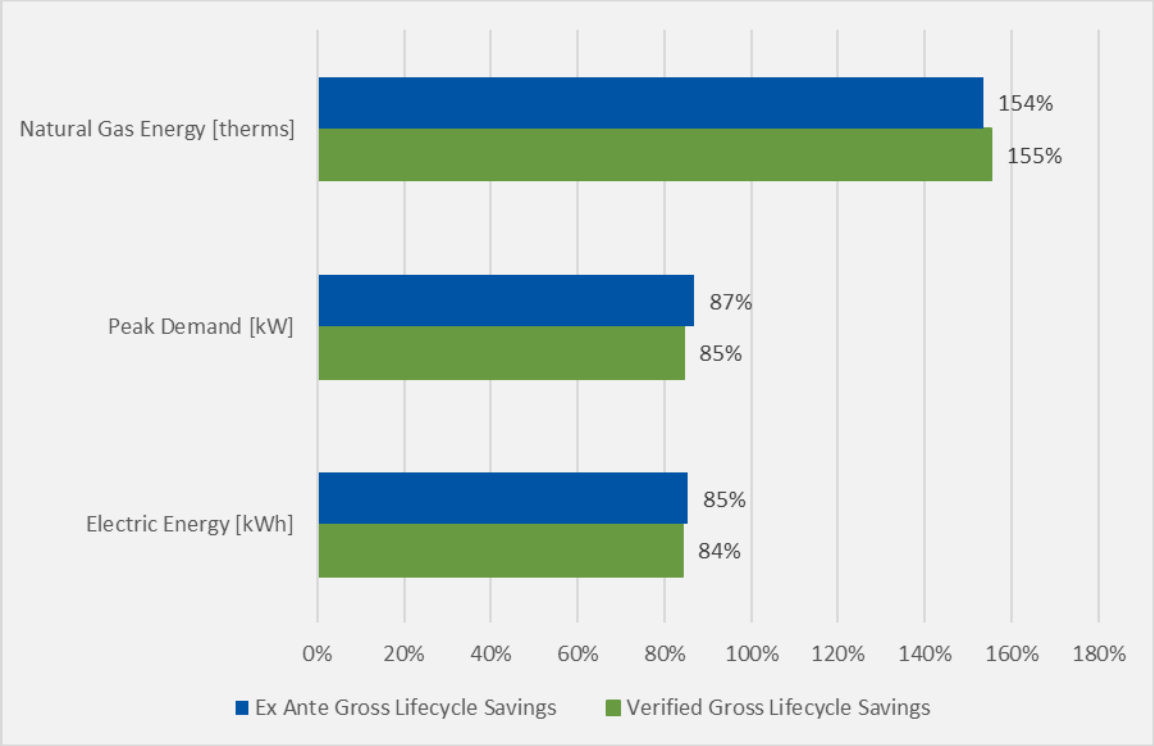
Item	Units	CY 2018 [a]	CY 2019
Incentive Spending	$	$1,234,665	$1,365,740
Participation [b]	Number of Participants	363	479
Verified Gross Lifecycle Savings	kWh	135,701,727	123,034,672
	kW	1,071	1,068
	therms	5,318,174	7,237,708
Verified Gross Lifecycle Realization Rate	MMBtu	96%	100%
Net First-Year Savings	kWh/yr	8,595,100	8,375,047
	kW	867	790
	therms/yr	248,640	315,980
Net Lifecycle Savings	MMBtu	805,834	846,110
Annual Net-to-Gross Ratio	MMBtu	81%	74%
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	Multifamily Energy Savings: 2.66 Multifamily New Construction: 3.88	1.74

[a] Includes Multifamily New Construction Program results
[b] Participants are defined as the multifamily property owners or managers.

Figure 45 shows the percentage of gross lifecycle savings goals achieved by the Multifamily Energy Savings Program in CY 2019. The Program achieved its CY 2019 therms savings goal but did not achieve its *ex ante* electric energy and peak demand savings goals. The Program moderately increased its

electric savings goal, and it achieved more gross electric savings than in CY 2018. The Program Implementer said it did not achieve the electric savings and peak demand goals largely because the incentive budget was used for natural gas-saving projects, and that many electric-saving projects were carried forward for payment in CY 2020.

Figure 45. Multifamily Energy Savings Program Achievement of CY 2019 Gross Lifecycle Savings Goal



The Program Implementer is required to meet a gross lifecycle MMBtu goal in addition to fuel-specific savings targets.

Evaluation, Measurement, and Verification Approach

In CY 2019, the Evaluation Team conducted impact and process evaluations of the Multifamily Energy Savings Program, designing its EM&V approach to integrate multiple perspectives in assessing its performance. Table 60 lists data collection activities and sample sizes used in the evaluation.

Table 60. Multifamily Energy Savings Program Data Collection Activities and Sample Sizes

Activity	CY 2019 Sample Size (n)
Program Actor Interviews	2
Tracking Database Review	Census
Annual Participant Survey	70
Ongoing Participant Satisfaction Survey	53
Engineering Desk Review	30
Verification Site Visits	23

Program Actor Interviews

In September 2019, the Evaluation Team interviewed the Program Administrator and Program Implementer to assess the Program's objectives and performance, investigate any implementation challenges, and identify solutions. The interview topics were designed to focus on changes to the Program design and delivery in CY 2019.

Tracking Database Review

The Evaluation Team reviewed a census of projects for the Multifamily Energy Savings Program in the tracking database, SPECTRUM, which involved completing the following tasks:

- Thoroughly review the data to ensure that SPECTRUM totals matched the totals reported by the Program Administrator
- Reassign savings from a number of database adjustment measures to the corresponding Program measures
- Check for complete and consistent application of information across data fields (measure names, application of lifetime savings, application of effective useful life [EUL])

Participant Surveys

To gather experiential feedback and data to inform Program-level installation rates and net savings calculations (freeridership and spillover), the Evaluation Team conducted an annual telephone survey with participating property owners and managers. Using the CY 2019 year-to-date Program participants listed in SPECTRUM, the Team constructed the survey population frame in October 2019. At the time of the survey, there were 324 participants (as determined by unique phone numbers). Seventy participants completed the survey, which met the targeted ±10% precision at 90% confidence.

Ongoing Participant Satisfaction Surveys

The PSC requested that the Evaluation Team conduct satisfaction surveys beginning in CY 2019 for the CY 2019–CY 2022 quadrennium, continuing the practice established for the previous quadrennium in CY 2015. There were two objectives for these satisfaction surveys:

- Understand customer satisfaction on an ongoing basis and respond to any changes in satisfaction before the end of the annual reporting schedule
- Help to facilitate timely follow-up with customers to clarify and address service concerns

The Team used SPECTRUM data to sample CY 2019 participants and administered web-based satisfaction surveys throughout the year. The Team supplemented these surveys by mailing paper surveys to participants without email addresses on file. The Team combined results from both modes for conducting the analysis. In total, 53 Multifamily Energy Savings Program participants responded to the CY 2019 survey. The survey covered several topics, such as the following:

- Overall satisfaction
- Satisfaction with Program staff and Trade Allies
- Likelihood of recommending the Program

- Likelihood of initiating another energy efficiency improvement
- Open feedback regarding the Program (comments and suggestions)

Engineering Desk Review

The Evaluation Team reviewed all available project documentation in SPECTRUM for a sample of 30 Program measures. This review included an assessment of the savings calculations and methodology applied by the Program Implementer. The Team relied on the applicable TRMs and other relevant secondary sources as needed. Secondary sources included energy codes and standards, case studies, and energy efficiency program evaluations of comparable measures (based on geography, sector, measure application, and date of issue).

For prescriptive measures, the Team used Focus on Energy TRM and associated work papers as primary sources to determine methodology and data in nearly all cases. For hybrid and custom measures, the Team reviewed the SPECTRUM savings analysis workbooks and adjusted inputs and methodologies as necessary based on engineering judgment and project documentation. The Team selected the evaluation sample for these reviews using a weighted, random stratified sampling approach known as probability proportional to size (PPS), where size is based on lifecycle total energy savings.

Verification Site Visits

The Evaluation Team conducted 23 verification site visits for the CY 2019 Multifamily Energy Savings Program. Site visits involved verifying the type and quantity of equipment installed, determining how the installed equipment is controlled, and documenting the operating hours of the installed equipment. The Team verified savings calculation input parameters based on operational and occupancy schedules, claimed and observed setpoints, trend data, utility data, and any other relevant details identified prior to or upon arrival at the site.

Impact Evaluation

The Evaluation Team used these approaches to measure the impact of the Multifamily Energy Savings Program:

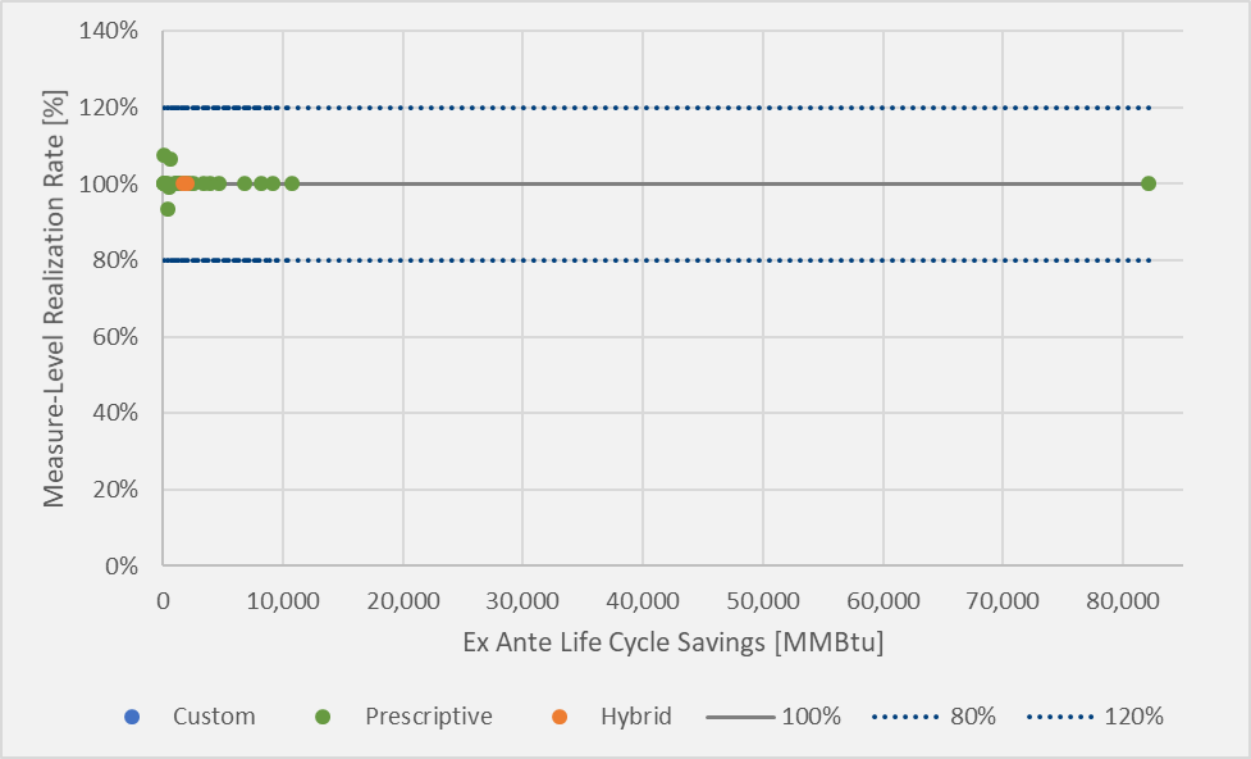
- Tracking database review
- In-service rate determination
- Engineering desk reviews
- Verification site visits

Evaluation of Gross Savings

The Evaluation Team used the CY 2019 tracking data to gather reported installations. The Team then applied the results from engineering desk reviews (n=30) and verification site visits (n=23) to determine verified gross savings. The sampled measures represent 9% of lifecycle MMBtu savings for the Multifamily Energy Savings Program.

Figure 46 represents the magnitude and associated realization rates for reported MMBtu savings among sampled measures. No sites had realization rates greater than 120% or below 80%. Specific details related to these projects can be found in *Appendix H*.

Figure 46. Multifamily Energy Savings Program Sample Results



The more atypical measure-level realization rates can be explained by minor differences between the deemed parameters in the 2019 TRM and the values applied in the SPECTRUM database to calculate *ex ante* savings estimates. Most of the differences in parameters between the two sources of information are a result of rounding errors.

Verified Gross Savings Results

Table 61 lists the first-year and lifecycle realization rates for the CY 2019 Program. Overall, the Program achieved a first-year evaluated realization rate of 100%, weighted by total (MMBtu) energy savings. Adjustments to the EUL drive the difference between first-year and lifecycle realization rates.

The totals presented in this report are derived using *ex ante* savings weighting of the realization rates of a sample of projects chosen using a probability proportional to size (PPS) sampling methodology.

Table 61. CY 2019 Multifamily Energy Savings Program
First Year and Lifecycle Realization Rates

Measure	First-Year Realization Rate				Lifecycle Realization Rate		
	kWh	kW	therms	MMBtu	kWh	therms	MMBtu
Total	99%	97%	102%	100%	99%	101%	100%

Table 62 lists *ex ante* and verified first-year gross savings for the Program for CY 2019 by measure type.

Table 62. CY 2019 Multifamily Energy Savings Program First-Year Gross Savings Summary

Measure	*Ex Ante* Gross First Year			Verified Gross First Year		
	kWh	kW	therms	kWh	kW	therms
Aeration	2,132	0	23,134	2,109	0	23,502
Air Sealing	6,151	12	24,789	6,086	11	25,184
Boiler	0	0	159,843	0	0	162,390
Controls	241,478	4	15,536	238,908	4	15,784
Energy Recovery	-247	1	1,379	-244	1	1,401
Furnace	193,335	60	45,540	191,277	58	46,265
Insulation	78,036	47	53,572	77,205	46	54,426
Light Emitting Diode (LED)	10,445,604	871	0	10,334,433	846	0
Motor	7,616	1	0	7,535	1	0
Other	42,082	0	48,108	41,634	0	48,875
Packaged Terminal Unit (PTAC, PTHP)	145,516	8	0	143,967	8	0
Rooftop Unit/Split System A/C	90,243	67	0	89,282	65	0
Steam Trap	0	0	44,360	0	0	45,067
Variable Speed Drive	184,008	28	0	182,050	28	0
Water Heater	-300	0	566	-297	0	575
Window	3,726	0	3,476	3,686	0	3,531
Total First Year	**11,439,379**	**1,099**	**420,303**	**11,317,631**	**1,068**	**427,000**

Table 63 lists *ex ante* and verified gross lifecycle savings by measure type for the Program in CY 2019.

Table 63. CY 2019 Multifamily Energy Savings Program Lifecycle Gross Savings Summary

Measure	*Ex Ante* Gross Lifecycle			Verified Gross Lifecycle		
	kWh	kW	therms	kWh	kW	therms
Aeration	21,320	0	231,337	21,001	0	234,220
Air Sealing	92,265	12	371,835	90,884	11	376,469
Boiler	0	0	3,196,867	0	0	3,236,707
Controls	2,237,073	4	140,471	2,203,587	4	142,221
Energy Recovery	-3,705	1	20,685	-3,650	1	20,943
Furnace	3,671,690	60	842,076	3,616,730	58	852,571
Insulation	1,951,007	47	1,280,312	1,921,803	46	1,296,268
Light Emitting Diode (LED)	110,008,635	871	0	108,361,959	846	0
Motor	137,083	1	0	135,031	1	0
Other	420,820	0	721,617	414,521	0	730,610
Packaged Terminal Unit (PTAC, PTHP)	2,182,740	8	0	2,150,067	8	0
Rooftop Unit/Split System A/C	1,353,645	67	0	1,333,382	65	0
Steam Trap	0	0	266,160	0	0	269,477
Variable Speed Drive	2,760,223	28	0	2,718,906	28	0
Water Heater	-3,000	0	7,740	-2,955	0	7,836
Window	74,520	0	69,520	73,405	0	70,386
Total Lifecycle	**124,904,316**	**1,099**	**7,148,620**	**123,034,672**	**1,068**	**7,237,708**

Evaluation of Net Savings

The Evaluation Team used participant surveys to assess net savings for the Multifamily Energy Savings Program. The Team calculated a 74% NTG for the CY 2019 Program. For a detailed description of NTG analysis methodology and findings, refer to *Appendix I. Net Savings Analysis*.

Freeridership Findings

The Evaluation Team used the self-report survey method to determine the Program's freeridership and spillover for CY 2019. For CY 2019, the Evaluation Team implemented a modification of past freeridership measurements. For the CY 2015 and CY 2016 freeridership research, the team relied on customers' self-reported intention to purchase a measure in the absence of the program. Survey items for this approach addressed the program's effect on the efficiency, quantity, and timing of purchases. This portion of the freeridership measurement did not change in CY 2019.

Persistent conjecture in the industry, however, indicates intention self-reports may be subject to biases, yielding an inflated freeridership value. To address this possibility and to provide a triangulation of approaches to the estimate, the team integrated a second set of survey questions in CY 2019, designed to measure the program's perceived *influence* on the respondents' purchasing decisions.

To estimate program influence, the survey asked respondents to rate the influence of five program elements on their purchasing decisions. Responses were captured using a 1 to 4 scale, with 1 meaning "not at all important" and 4 meaning "very important." A surveyed participant's overall influence rating equaled the maximum influence of any single program element. This drew upon an underlying principle: if a single element had a substantial influence on a respondent's purchasing decision, the program successfully influenced the respondent.

For example, to capture respondents' perspectives on elements driving them to an energy-efficient action, the survey included a question shown in Table 64. In this example, a 4 for the Focus on Energy program incentive or discount (the highest rating) represents the influence component score of freeridership for the respondent.

Table 64. Freeridership Influence Component Question

We would like to know more about the factors that contributed to your purchase of the energy-efficient [MEASURE][s]. I'm going to read a list of possible factors that could have contributed to your decision. For each of the factors listed, please rate how important it was in your decision. Use a scale from 1 to 4, with 1 meaning the factor was "not at all important" and 4 meaning the factor was "very important" in your decision to purchase the energy-efficient [MEASURE][s].						
Rate Influence of Program Elements						
	Not at all important	***Not too important***	***Somewhat important***	***Very important***	**Don't Know**	**Not Applicable**
The Focus on Energy incentive or discount	1	2	3	(4)	DK	N/A
Recommendation from Focus on Energy Staff	1	2	3	4	(DK)	N/A
Information provided by Focus on Energy on energy-savings opportunities	1	2	3	4	(DK)	N/A
Recommendation from contractor or vendor	1	(2)	3	4	DK	N/A
Previous participation in a Focus on Energy energy efficiency program	1	2	(3)	4	DK	N/A

High program influence and freeridership levels maintain an inverse relationship: the greater the program influence, the lower the participant's final freeridership score. Table 65 presents freeridership levels implied by the influence ratings.

Table 65. Freeridership Implied by Response to Influence Items

Maximum Influence Rating	Freeridership Implied by Response
1 – Not important	100%
2	75%
3	25%
4 - Very important	0%
Don't know	50%

By combining the previously used *intention* methodology (maximum of 100%) with the *influence* methodology (maximum of 100%), through simple averaging at the individual level, the team produced a combined freeridership estimate for each respondent.

The Team estimated an average self-reported freeridership of 27% and spillover of 1%, weighted by verified lifecycle evaluated MMBtu savings, for the CY 2019 Program.

Verified Net Savings Results

To calculate the Program NTG, the Evaluation Team combined the self-reported freeridership and spillover results using the following equation:

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

This yielded an overall NTG estimate of 74% for the Program. Table 66 shows total net-of-freeridership savings, participant spillover savings, total net savings in MMBtu, and overall Program NTG.

Table 66. Multifamily Energy Savings Program Lifecycle Net Savings and NTG

Net-of-Freeridership Savings (MMBtu)	Participant Spillover Savings (MMBtu)	Total Lifecycle Gross Verified Savings (MMBtu)	Total Lifecycle Net Savings (MMBtu)	Program Lifecycle NTG Ratio
834,676	11,434	1,143,391	846,110	74%

Table 67 shows the first-year net demand and energy impacts (kWh, kW, and therms) by measure category for the Program. The Evaluation Team attributed these savings as net of what would have occurred naturally without the presence of the Program.

Table 67. Multifamily Energy Savings Program First-Year Net Savings

Measure	First-Year Net		
	kWh	kW	therms
Aeration	1,561	0	17,392
Air Sealing	4,503	8	18,636
Boiler	0	0	120,169
Controls	176,792	3	11,680
Energy Recovery	-181	1	1,037
Furnace	141,545	43	34,236
Insulation	57,132	34	40,275
Light Emitting Diode (LED)	7,647,480	626	0
Motor	5,576	1	0
Other	30,809	0	36,167
Packaged Terminal Unit (PTAC, PTHP)	106,536	6	0
Rooftop Unit/Split System A/C	66,069	48	0
Steam Trap	0	0	33,349
Variable Speed Drive	134,717	20	0
Water Heater	-220	0	426
Window	2,728	0	2,613
Total First Year	**8,375,047**	**790**	**315,980**

Table 68 lists the lifecycle net demand and energy impacts (kWh, kW, and therms) by measure category for the Program.

Table 68. Multifamily Energy Savings Program Lifecycle Net Savings

Measure	Lifecycle Net		
	kWh	kW	therms
Aeration	15,541	0	173,323
Air Sealing	67,254	8	278,587
Boiler	0	0	2,395,163
Controls	1,630,654	3	105,244
Energy Recovery	-2,701	1	15,498
Furnace	2,676,380	43	630,902

Measure	Lifecycle Net		
	kWh	kW	therms
Insulation	1,422,134	34	959,238
Light Emitting Diode (LED)	80,187,850	626	0
Motor	99,923	1	0
Other	306,745	0	540,651
Packaged Terminal Unit (PTAC, PTHP)	1,591,050	6	0
Rooftop Unit/Split System A/C	986,703	48	0
Steam Trap	0	0	199,413
Variable Speed Drive	2,011,991	20	0
Water Heater	-2,187	0	5,799
Window	54,319	0	52,086
Total Lifecycle	**91,045,658**	**790**	**5,355,904**

Process Evaluation

In CY 2019, the Evaluation Team conducted interviews with the Program Administrator and Program Implementer, a participant satisfaction survey, and a materials review. The process evaluation focused on property owner and manager satisfaction with Program components and with the effectiveness of the Program design, marketing, and processes.

Program Design, Delivery, and Goals

Focus on Energy began providing prescriptive and custom incentives through the Multifamily Energy Savings Program for eligible retrofit projects in 2001 and for new construction projects in 2017. The Program Implementer's Energy Advisors and Trade Allies work primarily with property owners, managers, and developers to encourage and reward installations of energy-efficient equipment. For new construction projects, a multifamily property developer, architect, or owner can bring any eligible building or equipment upgrade project to the Program, regardless of the project's phase in design or implementation.[29]

Program Management and Delivery Structure

The Program Implementer's Program Manager is supported by Energy Advisors, engineers, field technicians, and staff who handle marketing, Trade Ally and participant engagement, and application processing.

Energy Advisors conduct outreach to Trade Allies and property managers, owners, and developers. The Program Implementer encourages property managers and owners to pursue energy-efficient upgrades by offering free energy assessments and by suggesting they contact a Trade Ally.

[29] Unlike the Design Assistance Program, projects in the Multifamily Energy Savings Program are eligible for incentives even if developers had finalized design decisions.

Program Changes

In CY 2019, Focus on Energy made several changes to the Multifamily Energy Savings Program to align with changing market conditions and administrative needs. This section highlights these changes.

Program Consolidation

In CY 2019, Focus on Energy consolidated the Multifamily New Construction Program with the Multifamily Energy Savings Program to limit market confusion and duplicate administrative activity across the two programs.

Common Area Lighting Package

Focus on Energy discontinued the retrofit prescriptive incentives known as the Common Area Lighting Package (CALP), which was introduced in CY 2013. Through CALP, participating property owners and managers had contributed a co-pay, determined by the amount of wattage reduced, to receive upgrades such as LED fixtures, lamps, and occupancy sensors in common areas. The Program Implementer said limited budget and cost-effectiveness constrained CALP promotion and that Trade Allies struggled to increase participation by CALP customers in other Focus on Energy offerings. All CALP incentives paid in CY 2019 were for projects that had been approved in CY 2018 but not completed until 2019.

Program Incentives

The Program Implementer made the following changes to its standard prescriptive offerings:

- Added incentives for split system heat pumps, domestic water pump variable frequency drives (VFDs), residential-type gas tankless water heaters, air sealing, and several lamp and fixture measures
- Revised measure eligibility criteria for packaged terminal heat pump, direct expansion cooling, pump and fan VFD, domestic hot water plant, and troffer measures
- Discontinued new construction measure eligibility for electronically commutated motor (ECM) fans

The Program Implementer made no changes to the custom incentives.[30]

Program Energy Assessments

The Program Implementer offers property managers and owners free energy assessments of existing buildings. Because of budget constraints, the Program Implementer decided to reduce its Energy Advisor staff from four to three, and in June 2019 it made several changes to expand and streamline this service:

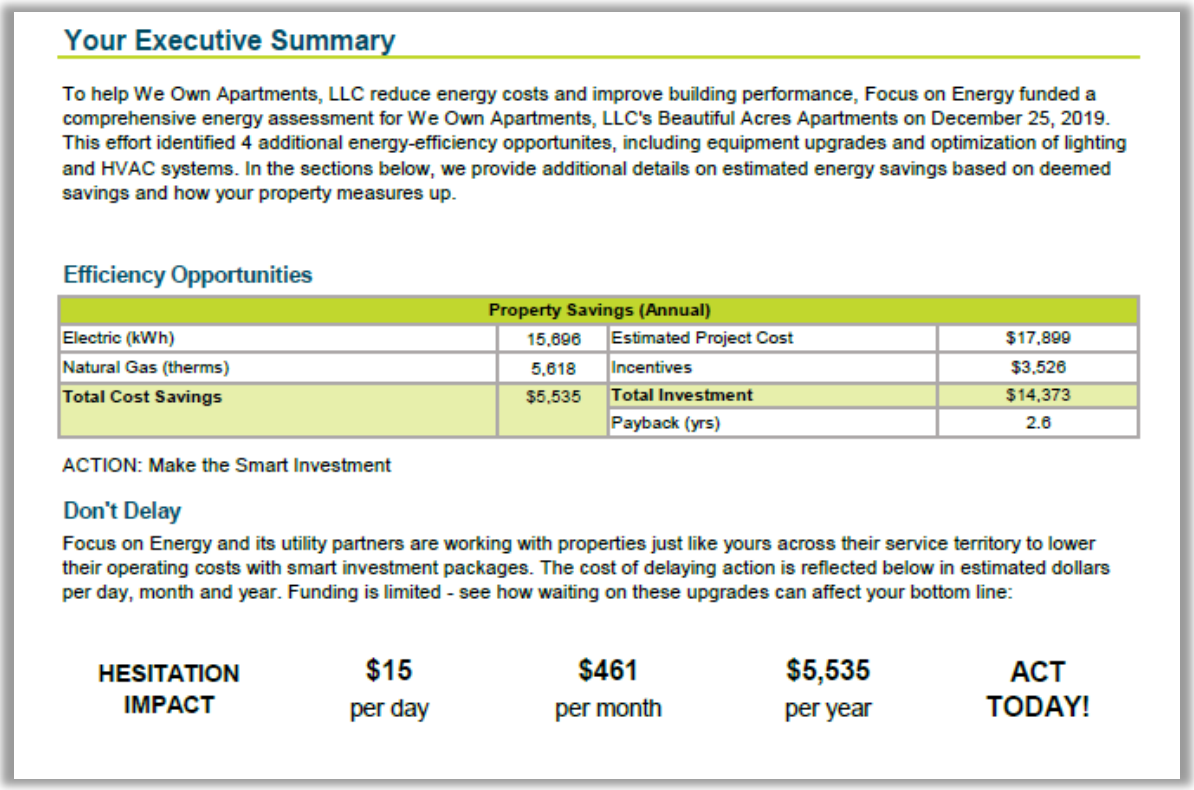
- Confirmed that all Energy Advisors are using the same energy assessment report template and documenting report delivery.
- Revised the assessment approach by offering remote audits in addition to the on-site property walkthroughs. This change allowed Program Implementer staff to focus on-site energy audits on buildings with the most energy-savings potential. In a remote audit, customers contribute

[30] Custom incentives for multifamily projects are $0.80 per therm, $100 per kilowatt, and $0.05 per kilowatt-hour.

directly to documenting common area energy-saving opportunities by describing the building and its equipment over the phone and providing digital photos.

- Revised the energy assessment report template to clearly identify recommended building retrofit opportunities and next steps to take action, including the "opportunity costs" of inaction, to spur urgency (Figure 47).

Figure 47. Example of Executive Summary from Energy Assessment Report



Your Executive Summary

To help We Own Apartments, LLC reduce energy costs and improve building performance, Focus on Energy funded a comprehensive energy assessment for We Own Apartments, LLC's Beautiful Acres Apartments on December 25, 2019. This effort identified 4 additional energy-efficiency opportunites, including equipment upgrades and optimization of lighting and HVAC systems. In the sections below, we provide additional details on estimated energy savings based on deemed savings and how your property measures up.

Efficiency Opportunities

Property Savings (Annual)			
Electric (kWh)	15,696	Estimated Project Cost	$17,899
Natural Gas (therms)	5,618	Incentives	$3,526
Total Cost Savings	$5,535	**Total Investment**	$14,373
		Payback (yrs)	2.6

ACTION: Make the Smart Investment

Don't Delay

Focus on Energy and its utility partners are working with properties just like yours across their service territory to lower their operating costs with smart investment packages. The cost of delaying action is reflected below in estimated dollars per day, month and year. Funding is limited - see how waiting on these upgrades can affect your bottom line:

HESITATION IMPACT	**$15** per day	**$461** per month	**$5,535** per year	**ACT TODAY!**

Source: Focus on Energy Multifamily Energy Savings Assessment Report. Received September 24, 2019.

The Program Administrator and Program Implementer noted that these changes have not yet realized energy savings but that they succeeded in improving the process and allowing time to reach more customers. The Program Implementer does not track the number of assessments completed annually and could not determine to what extent the change expanded its outreach capabilities.

Program Goals

The overall objective of the Multifamily Energy Savings Program is to encourage multifamily building owners and managers to use energy-efficient products and equipment for common area spaces.

Table 69 presents the savings goals set by Focus on Energy and CY 2019 results for the Multifamily Energy Savings Program.[31]

Table 69. Multifamily Energy Savings Program CY 2019 Goals and Achievements

Performance Metric	CY 2019 Goal	CY 2019 *Ex Ante* Actual
Lifecycle electric savings (kWh)	146,315,666	124,904,316
Lifecycle natural gas savings (therms)	4,657,080	7,148,620
Demand reduction (kW)	1,264	1,099

In addition to energy and participation achievements, the Program Implementer measured Program performance by tracking key performance indicators (KPIs), such as application processing times and recruitment of new Trade Allies. The Program Implementer said it performed satisfactorily against all of its KPIs except the new goal in CY 2019 to produce at least 35% of its savings from new construction projects (the Program achieved 24%, 29%, and 30% of its lifecycle kWh savings, therm savings, and kW reduction achievements, respectively, from new construction).

The Program Administrator said the planned shift in program design in CY 2020 from a program-centric to a portfolio-centric approach is causing some disruption in program-level outreach and participation, but the issue will be resolved once the new program design is in place.

Marketing and Outreach

During interviews, the Program Implementer highlighted the marketing and outreach tactics and campaigns for the Multifamily Energy Savings Program. The CY 2019 marketing strategies included these elements:

- Direct outreach to property owners and managers and building developers through sell sheets and email blasts
- Articles in multifamily industry association newsletters
- Participation in industry meetings and trade shows
- Direct mail campaigns to property owners, in collaboration with Wisconsin utilities
- Program collateral for outreach staff or Trade Allies' use with prospective customers
- Email blasts, webinars, direct mail, and sell sheets promoted directly to Trade Allies

In CY 2019, marketing to Trade Allies involved coordinating Multifamily Energy Savings Program marketing campaigns and material development with the Business Incentive and Small Business programs. Similar to CY 2018, the Program Implementer delivered two distinct campaigns to Trade Allies.

[31] Metrics presented in this section represent Focus on Energy's targets for the Program and not contractual goals for the Program Implementer. The Program Implementer is required to meet a gross lifecycle MMBtu goal in addition to fuel-specific savings targets.

The first campaign mailed individualized semiannual performance reports to show how each Trade Ally contributed to program savings achievement (before CY 2019, these reports were sent quarterly).

In the second campaign, staff refreshed a personalized direct-mail campaign conducted in CY 2018 that reminded Trade Allies of their respective Energy Advisors. In CY 2019, this mailing also included a Focus-branded pencil encouraging Trade Allies to "pencil in" a meeting or phone call with Energy Advisors.

Customer Experience

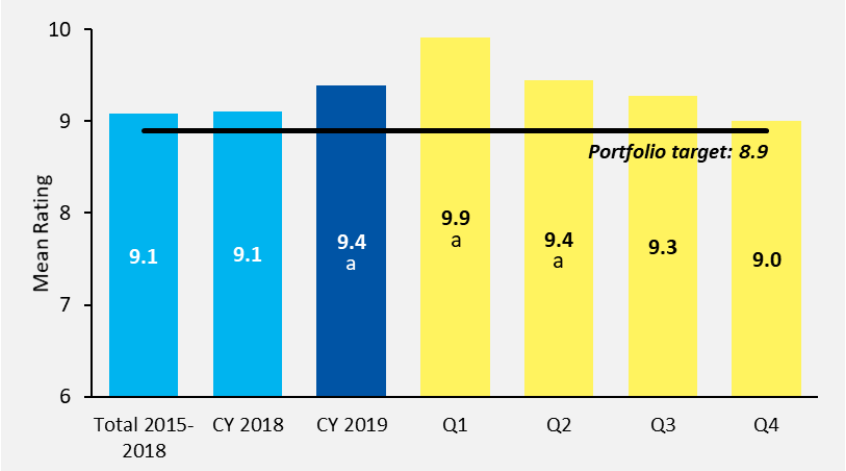
To better understand the customer's experience with the Multifamily Energy Savings Program, including Program awareness, marketing, customer decision-making, satisfaction, and participation barriers, the Evaluation Team collected 53 responses to an ongoing participant satisfaction survey and 70 responses to an annual survey of participating property owners and managers. The annual survey gathered in-depth feedback regarding participants' Program experience and also informs the impact evaluation.

Annual Results from Ongoing Participant Satisfaction Survey

Throughout CY 2019, the Evaluation Team surveyed Program participants to measure their satisfaction with various aspects of the Program. Respondents answered satisfaction and likelihood questions on a scale of 0 to 10, where 10 indicates the highest satisfaction or likelihood and 0 the lowest.[32]

As shown in Figure 48, in CY 2019 the average overall satisfaction rate was 9.4, which was significantly higher than the portfolio target of 8.9, but statistically equivalent to the average rating from CY 2018.[33]

Figure 48. CY 2019 Overall 9 Program Satisfaction



[32] The number of participants who completed a survey does not always match the number of responses for each question, as some participants skipped questions, did not know answers to questions, or did not qualify to answer questions based on previous answers or other known data about the participant.

[33] The Program Administrator's contract established a portfolio target of 8.9 to maintain or increase customer satisfaction. The Evaluation Team found that some surveys did not include identifying information to match survey responses to Program participation dates. The Team included survey responses without participation dates in the year-end total but not in the quarterly breakdown

Source: Multifamily Energy Savings Program Ongoing Participant Satisfaction Survey Question.
"Overall, how satisfied are you with the Program?" (CY 2018 n=37, CY 2019 n=53, Q1 n=11, Q2 n=18, Q3 n=18, Q4 n=4).
Total CY 2015–CY 2018 is the participation-weighted average of four annual results.
[a] This result is statistically significantly different from the result for CY 2018 (p<0.10 using a binomial t-test).

Table 70 shows the average satisfaction and likelihood ratings for CY 2019 and CY 2018. In CY 2019, the likelihood of recommending the Program (9.8) was significantly higher than in CY 2018, but the likelihood of making more improvements decreased significantly (5.3). Satisfaction rates with Energy Advisors (9.5) and Trade Allies (9.6) were up directionally but were not significantly different from CY 2018 ratings.

Table 70. CY 2019 Average Ratings for Multifamily Energy Savings Program

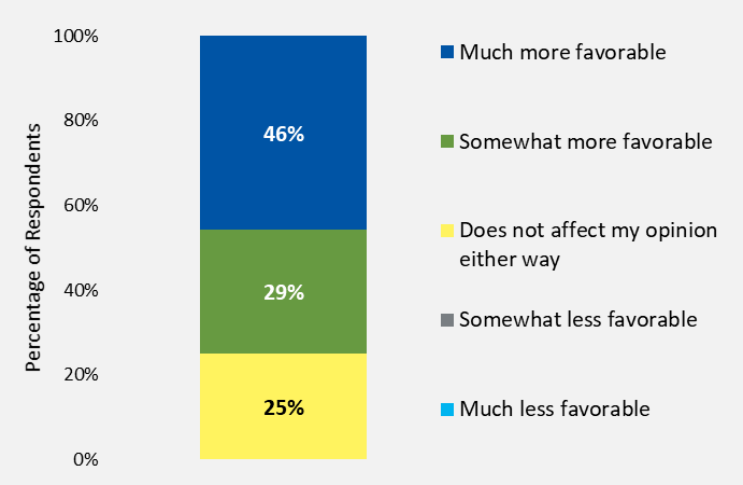
Item	CY 2018	CY 2019
Satisfaction with Energy Advisor	9.4	9.5
Satisfaction with Trade Ally	9.1	9.6
Likelihood of more improvements	7.7	5.3 [a]
Likelihood of recommending the Program	9.1	9.8 [a]

[a] This result is statistically significantly different from the result for CY 2018 (p<0.10 using a binomial t-test).

Using these survey data, the Evaluation Team calculated a net promoter score (NPS) based on customers' likelihood to recommend the Program. The NPS is expressed as an absolute number between -100 and +100 that represents the difference between the percentage of promoters (respondents giving a rating of 9 or 10) and detractors (respondents giving a rating of 0 to 6). The Multifamily Energy Savings Program's NPS was +94 for CY 2019, a substantial increase from +73 in CY 2018.

CY 2019 Program participants were asked if Focus on Energy offerings affected their opinion of their utilities, and almost half (46%) gave the highest rating of *much more favorable* (Figure 49). Twenty-five percent said their opinion was not affected, and no respondents reported that their opinion of their utility had become less favorable.

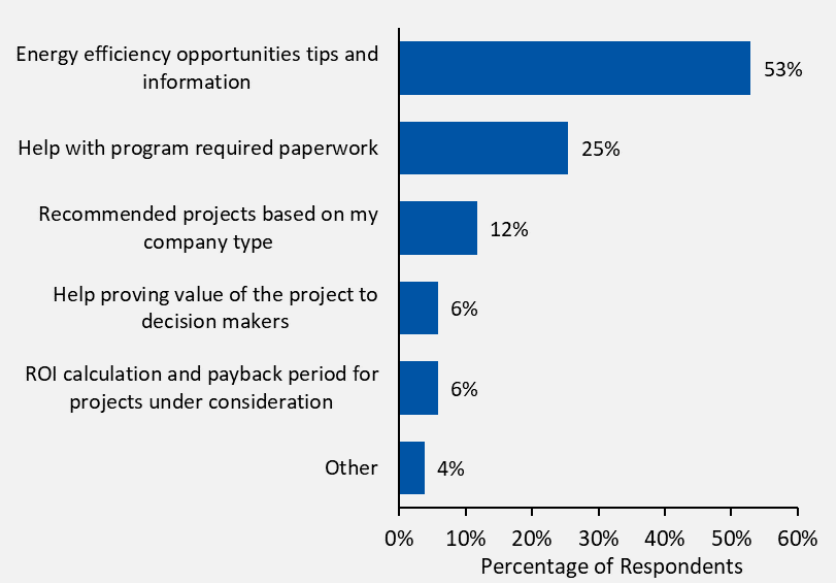
Figure 49. CY 2019 Effect of Focus on Energy Offerings on Opinion of Utilities



Source: Multifamily Energy Savings Program Ongoing Participant Satisfaction Survey Question.
"Your energy utility partners with Focus on Energy to offer energy efficiency programs to its customers. How have these offerings affected your opinion of your utility, if at all?" (n=48)

Survey respondents identified how Focus on Energy can best support their organization with future projects (Figure 50). The most frequent responses from Multifamily Energy Savings Program participants were energy efficiency opportunities, tips, and information (53%) and help with Program paperwork (25%).

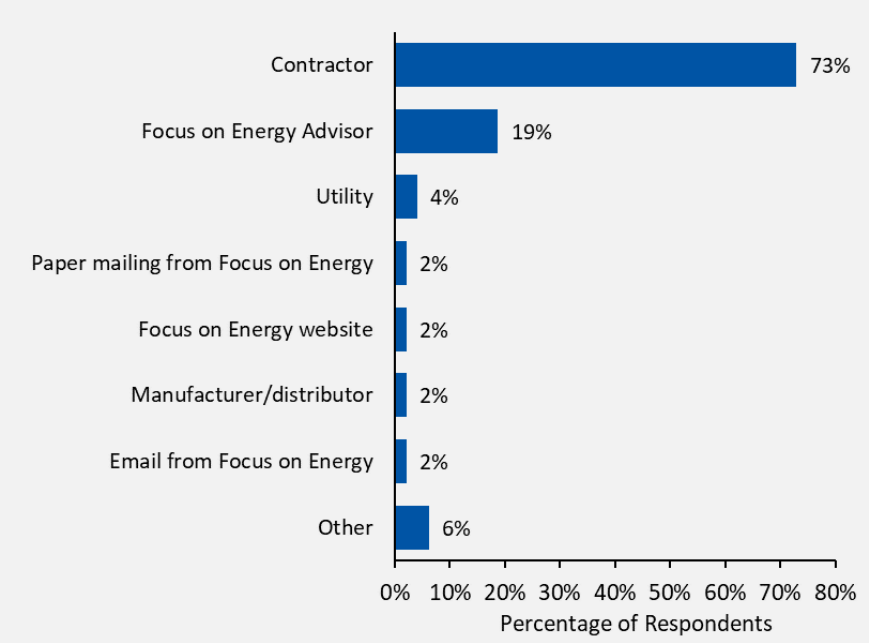
Figure 50. CY 2019 Most Valued Support



Source: Multifamily Energy Savings Program Ongoing Participant Satisfaction Survey Question.
"Aside from providing project incentive dollars, how can Focus on Energy best support your organization going forward?" (n=51). Responses total to more than 100% because multiple responses were allowed.

Program participants' top two sources of awareness of the Multifamily Energy Savings Program were communications from their contractors (73%) and from Energy Advisors (19%), as shown in Figure 51.

Figure 51. CY 2019 Sources of Program Awareness



Source: Multifamily Energy Savings Program Ongoing Participant Satisfaction Survey Question. "How did you learn about this particular opportunity from Focus on Energy?" (n=48). Responses total to more than 100% because multiple responses were allowed.

Participant Suggestions for Improvement

The ongoing participant satisfaction surveys also included questions about whether respondents had any comments or suggestions for improving the Programs.

Of the 53 participants who responded to the Multifamily Energy Savings Program survey, 13 (25%) provided open-ended feedback, which the Evaluation Team coded into a total of 19 mentions. Of these mentions, 10 were positive or complimentary (53%), and nine included suggestions for improvement (47%). Four of the positive comments reflected a generally good Program experience, three complimented the helpfulness of Program staff and Trade Allies, and one each expressed satisfaction with the measures installed, the incentive amount, and the convenience of the process.

The nine suggestions for improvement included three comments about increasing the Program scope (including incentives for additional measures such as thermostats), three comments about increasing incentives, two comments about reducing delays, and one about improving communications.

Multifamily Property Owner and Manager Survey

Through the annual survey, property owners and managers shared their in-depth program participation experiences with a project at a specific property. Seventy-one percent were apartment buildings, 26% were condominiums, and 3% were some combination of both, which was similar to CY 2016. The percentage of buildings with commercially leased space in CY 2019 was 20% (n=70), similar to the 19% in CY 2016 (n=70).

Building owners and property managers answered questions about program awareness, decision-making influences, participation barriers, and satisfaction with Program application components. Whenever possible, the Evaluation Team compared the CY 2019 survey results to the CY 2016, CY 2015, and CY 2013 survey results to document any changes or progress (the surveys were not administered in CY 2017 and CY 2018).

Multifamily Utility Bills

The Evaluation Team asked multifamily property owners and managers who pays the utility bills associated with their participating properties (Table 71). Ninety-four percent of residential condo owners are responsible for their unit's electric bill, which is a significantly higher percentage compared to residential apartment (80%) and commercial (43%) tenants.[34]

Table 71. Multifamily Utility Bill Responsibility

Responsible for Bill Payment	Electric Bill	Natural Gas Bill	Water Bill
Residential condo owner (n=17-18)	94%	72%	41%
Residential apartment tenant (n=44-49)	80%	42%	15%
Commercial tenant (n=12)	43%	N/A	N/A

Source: CY 2019 Multifamily Energy Savings Program Participant Survey Question B5: "Does the building owner pay the electric bill that includes these commercial tenants, or do those commercial tenants pay their own electric bill directly to the utility?"; Question B9: "For [SITE ADDRESS], does the building owner pay the electric bill that includes electricity used in the residential tenants' units, or do your tenants pay their own electric bill directly to the utility?"; Question B10: "Does that also apply to the natural gas bill?"; Question B11: "Does that also apply to the water bill?"

Property Owner and Manager Awareness

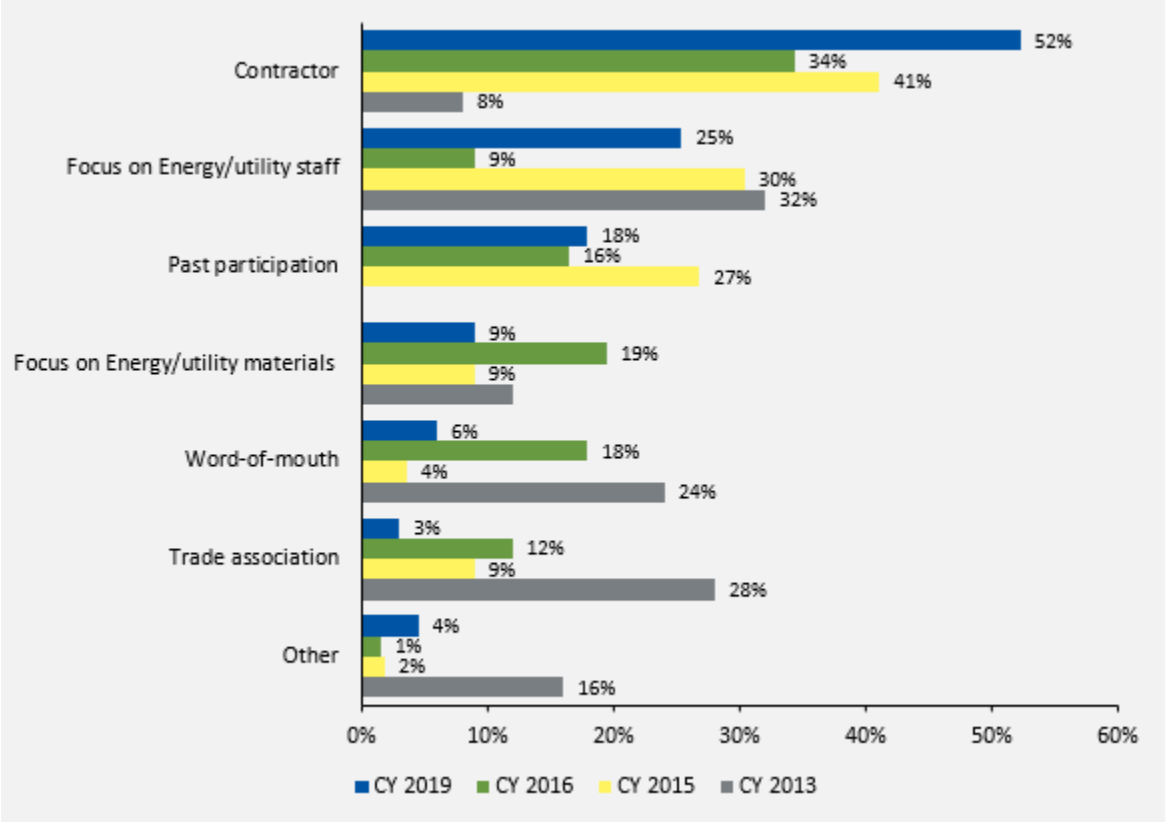
Respondents most often learned about the Multifamily Energy Savings Program incentives through their contractor (52%), followed by Focus on Energy or utility staff (25%). Both of these mentions significantly increased from CY 2016 to CY 2019,[35] while word of mouth and trade association mentions decreased significantly from CY 2016 to CY 2019.[36] There were no significant differences between CY 2015 and CY 2019 responses. Figure 52 shows responses from CY 2019, CY 2016, CY 2015, and CY 2013.

[34] $p < 0.05$ and $p < 0.01$, respectively, using a binomial t-test. Due to small sample sizes, however, statistical differences should be considered with caution.

[35] $p < 0.05$ and $p < 0.01$, respectively, using a binomial t-test.

[36] $p < 0.05$ using a binomial t-test.

Figure 52. How Customers Learned of Multifamily Energy Savings Program Incentives



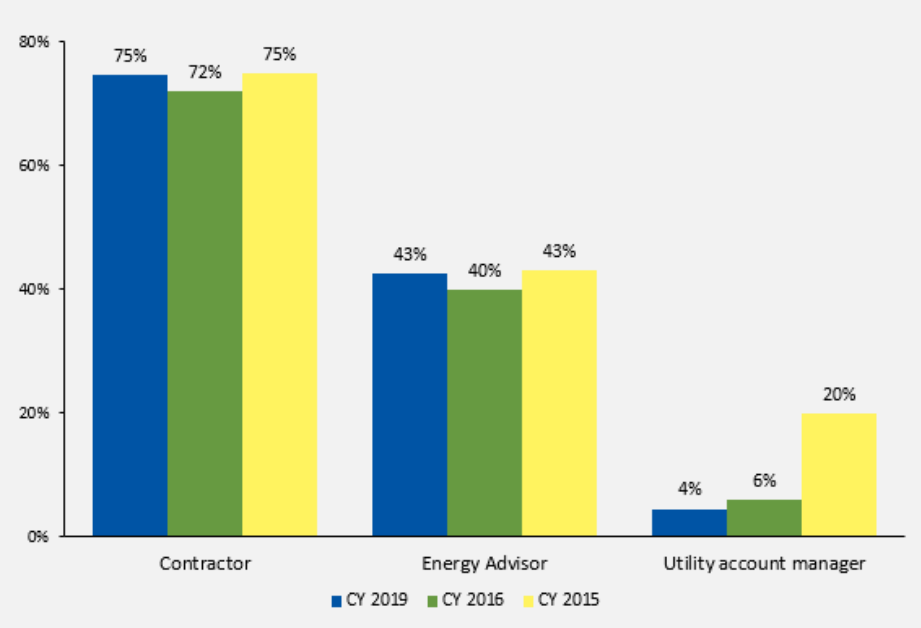
Source: CY 2019, CY 2016, CY 2015, and CY 2013 Multifamily Energy Savings Program Participant Survey Question C1: "How did your organization learn about the incentives available for this project?"
Multiple responses allowed (CY 2019 n=67; CY 2016 n=67; CY 2015 n=56; CY 2013 n=25)

Property owners and managers also identified contractors as the most common source of Multifamily Energy Savings Program project initiation. Three-fourths of respondents (75%) said contractors were involved, followed by Energy Advisors (43%) and utility account managers (4%). (Some respondents provided more than one answer, see Figure 53.) Significantly fewer respondents cited utility account managers as a source for project initiation compared to CY 2015.[37] One probable reason for this shift was that the Program Implementer's KPIs in CY 2019 and CY 2016 did not include a utility partnership for marketing efforts, as they had in CY 2015.[38]

[37] $p \leq 0.01$ using a binomial t-test.

[38] The Program Implementer's CY 2015 goal was to work with utilities to offer at least five campaigns annually, and seven utilities helped promote the Multifamily Energy Savings Program in CY 2015.

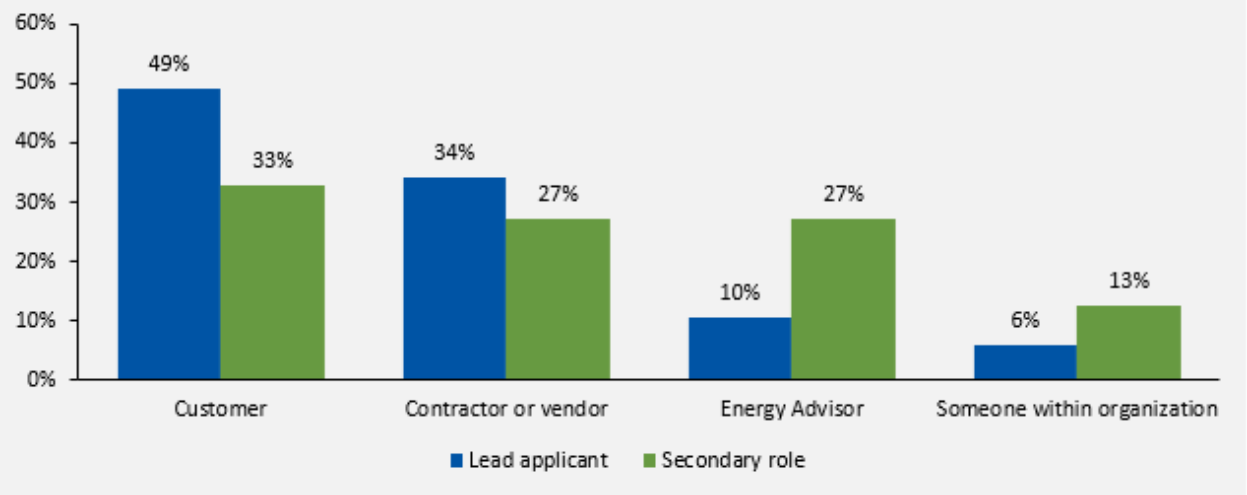
Figure 53. Multifamily Energy Savings Program Project Initiation Source



Source: CY 2019 Multifamily Energy Savings Program Participant Survey Question C2, CY 2016 Question D1, and CY 2015 Survey Question D2: "I'm going to read you a short list. Please tell me who, if anyone, was involved in helping you initiate your energy efficiency project." (CY 2019 n=67-68; CY 2016 n=65-69; CY 2015 n=66-69)

Over half of the participating property owners and managers (55%) said they or someone in their organization took the lead role in completing the incentive application, but that contractors and Energy Advisors also supported these efforts (Figure 54). When combining mentions of Energy Advisor support, a significantly higher percentage of CY 2019 respondents (33%) said an Energy Advisor led or contributed to completing the application compared to CY 2016 (9%).[39]

Figure 54. Multifamily Energy Savings Program Source of Application Support



[39] $p \leq 0.01$ using a binomial t-test.

Source: CY 2019 Multifamily Energy Savings Program Participant Survey Question C4, "Who took the lead role in completing the application for the financial incentive?" (n=67) and C5, "Who else contributed to completing the application for the financial incentive?" (n=55)

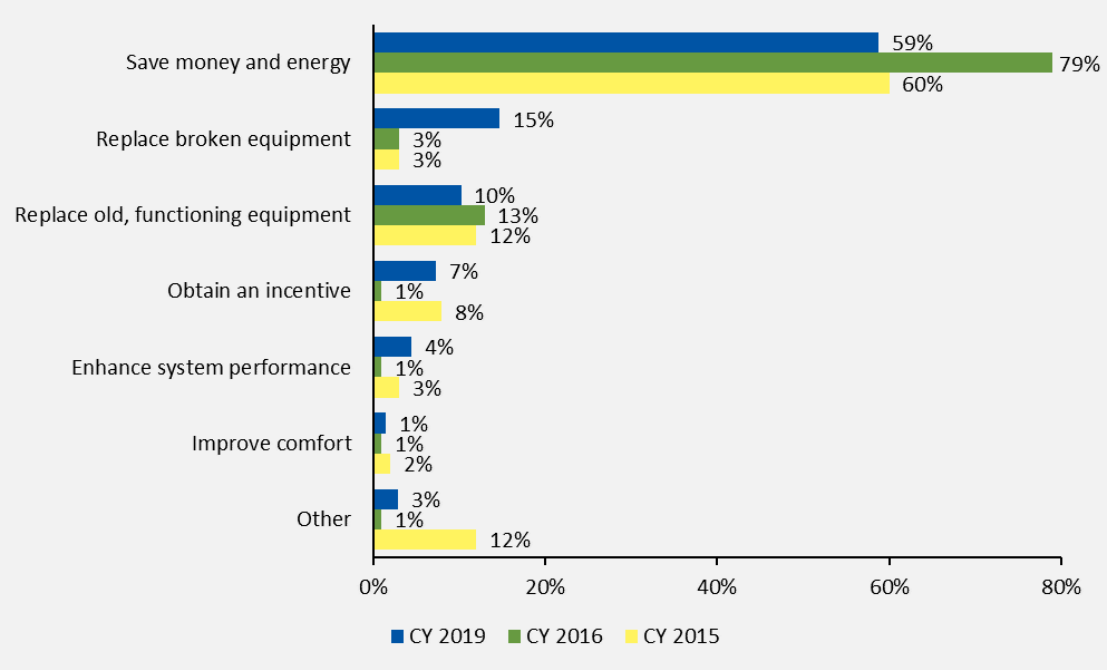
Property Owner and Manager Decision Influences

Property owners and managers shared their motivations for participating in the Multifamily Energy Savings Program. Respondents were most motivated to save money and energy (59%), which was significantly lower in CY 2019 compared to CY 2016 (79%), but comparable to CY 2015 (60%).[40]

A significantly higher percentage of CY 2019 respondents (15%) were motivated to replace broken equipment compared to CY 2015 (3%) and CY 2016 (3%).[41] Respondents motivated by replacing old or broken equipment were primarily property owners or managers of residential tenant buildings: 30% of single-use respondents (n=54) mentioned one or the other, compared to 7% of mixed-use building respondents (n=14).

Figure 55 shows the participants' motivations for participating.

Figure 55. Multifamily Energy Savings Program Participation Motivations



Source: CY 2019 Multifamily Energy Savings Program Participant Survey Question D1, CY 2016 Survey Question D2, and CY 2015 Survey Question D3: "What factor was most important to your company's decision to make these upgrades energy-efficient?" (CY 2019 n=68; CY 2016 n=70; CY 2015 n=60)

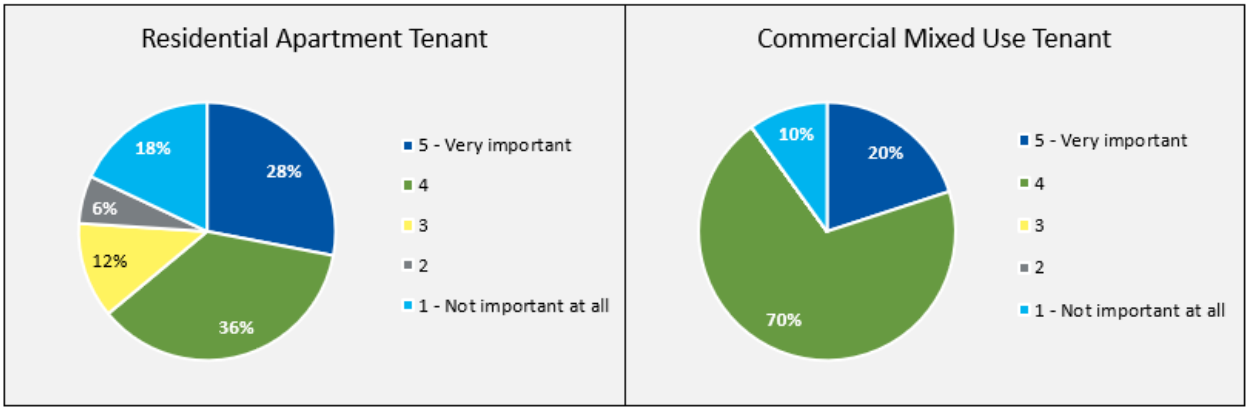
When asked to what extent tenant satisfaction factored into the decision-making process for retrofits, 64% of apartment building owners and managers rated its importance a 4 or 5 on a scale of 1 to 5,

[40] p ≤0.01 using a binomial t-test.

[41] p ≤0.01 using a binomial t-test.

where 1 was *not important at all* and 5 was *very important* (Figure 56). Nine out of 10 apartment and condo building owners and managers with mixed-use spaces rated the importance of tenant satisfaction a 4 or 5, compared to 58% of respondents whose projects were not in mixed-use buildings (due to sample size, these differences should be viewed with discretion).

Figure 56. Importance of Tenant Satisfaction in Decision-Making Process



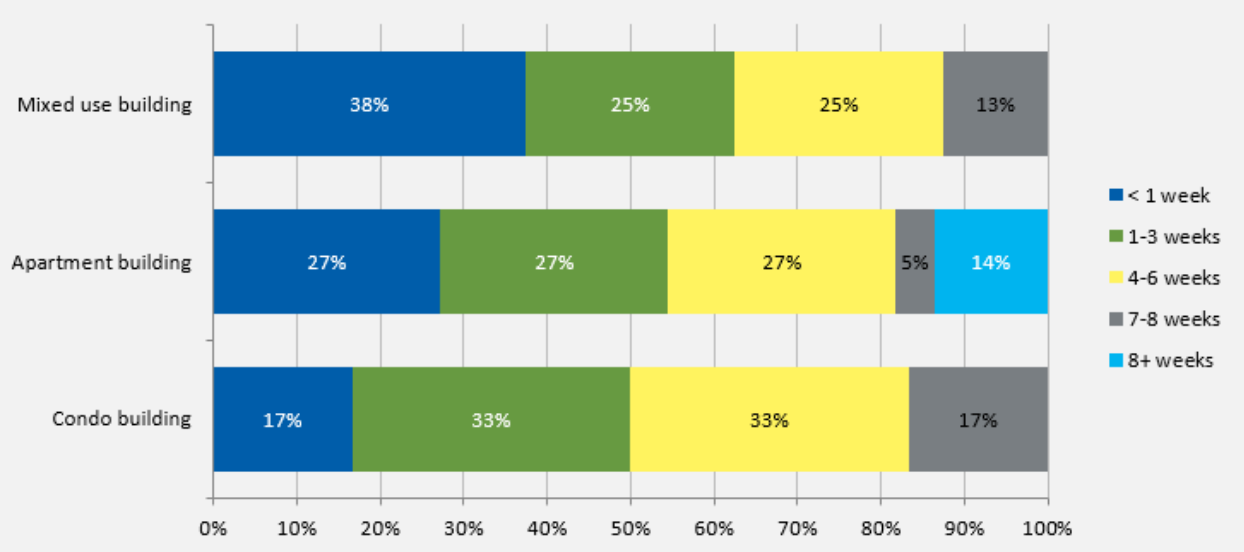
Source: CY 2019 Multifamily Energy Savings Program Participant Survey Question D2: "To what extent did tenant satisfaction factor into the decision-making for the energy-efficient upgrade? Please rate the importance of tenant satisfaction in your decision-making for this particular project on a scale of 1 to 5, where 5 is very important, and 1 is not important at all." (Apartment n=50; Mixed Use n=10)

About half of apartment building (residential, tenant occupied) property owners and managers (53%, n=49) require approval to proceed with capital upgrades for their buildings. Two-thirds of mixed-use (residential and commercial, tenant occupied) property managers and owners (64%, n=14) require approval. By contrast, only one-third of condominium (residential, owner occupied) building owners and managers (33%, n=18) said they require approval for building upgrades.

These results are different from CY 2016, when 76% of condo building respondents said they require approval for building upgrades; however, 53% of CY 2016 condo building respondents defined their role as a property manager, compared to 17% of CY 2019 condo building respondents. Of the CY 2019 condo respondent pool, 67% identified themselves as property owners, which suggests that condo owners consider themselves to be the building decision-makers.

Of those who require approval and were aware of the process, timelines for approvals were similar for apartment and condo building owners and managers. Upgrade approvals in apartment and condo buildings with mixed-use tenant spaces proceeded on a slightly faster schedule. Figure 57 shows participants' building upgrade approval timelines by building type.

Figure 57. Multifamily Building Upgrade Approval Timelines by Building Type



Source: CY 2019 Multifamily Energy Savings Program Participant Survey Question D5:
"How long does it typically take to receive approval to move forward with an energy efficiency upgrade?"
(Mixed use building n= 8, apartment building n=22, condo building n=6)

Property Owner and Manager Training

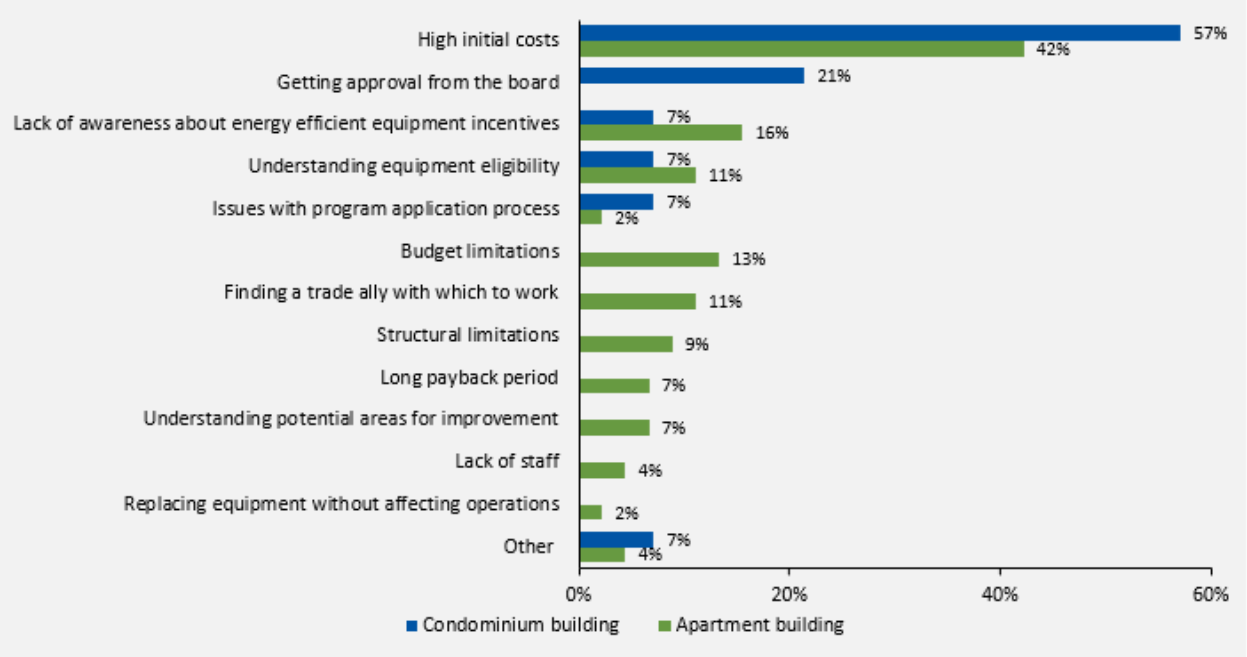
The Evaluation Team asked building owners and managers if they had attended a training sponsored by Focus on Energy in the past two years. The only respondent who reported attending a recent training said the training was *not at all important* in the decision to move forward with the energy-efficient upgrades.

Property Owner and Manager Barriers to Participation

Multifamily Energy Savings Program property owner and manager respondents cited a variety of barriers to participating in the Program. The frequency of these barriers varied by participating building type. Respondents most frequently reported high initial costs as the primary barrier, regardless of building type.

The second most common barrier for respondents with participating condo buildings was getting board approval, while apartment building respondents cited lack of awareness about incentives for energy-efficient equipment (Figure 58). Similar to apartment building respondents, owners and managers of mixed-use buildings most commonly mentioned high initial costs (50%, n=12) and lack of awareness about available incentives (25%) as their primary barriers.

Figure 58. Barriers to Implementing Multifamily Energy Savings Program Projects

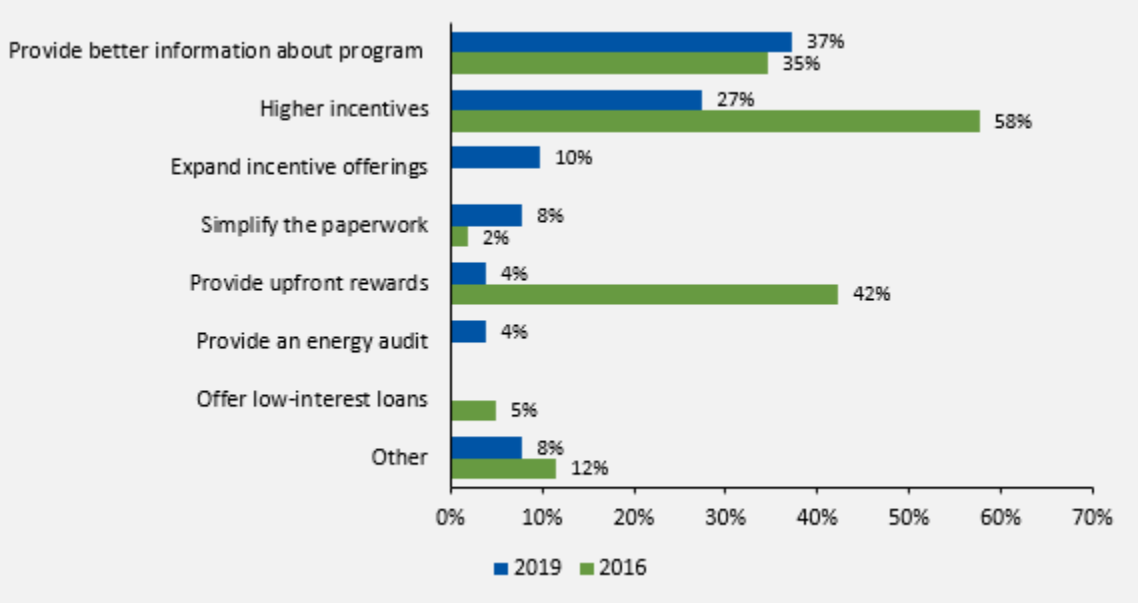


Source: CY 2019 Multifamily Energy Savings Program Participant Survey Question E1: "What do you see as the biggest challenges to making energy-efficient improvements at your properties?" Multiple responses allowed (condominium building n=14, apartment building n=45)

The Evaluation Team asked respondents what could be done to help them overcome the challenges to making energy-efficient improvements at their properties. The most common response was a suggestion for better information about the Program (Figure 59). Twenty-seven percent suggested higher incentives, a significantly lower percentage compared to CY 2016 (58%). Moreover, significantly fewer CY 2019 respondents suggested that the Program provide upfront rewards compared to CY 2016.[42]

[42] p ≤0.01 using a binomial t-test.

Figure 59. Respondent Suggestions for Reducing Challenges



Source: CY 2019 and CY 2016 Multifamily Energy Savings Program Participant Survey Question E2:
"What could be done to help your company overcome challenges with energy efficiency improvements?"
Multiple responses allowed (CY 2019 n=51, CY 2016 n=52)

The Evaluation Team asked respondents who mentioned the need for more or better information about the Program (n=19) what type of information would have been helpful. Respondents provided the following suggestions:

- General awareness about available programs and incentives (10 respondents), with five of these respondents requesting physical materials such as catalogs, pamphlets, or other mailings; one respondent suggesting more information is needed for homeowners' associations; and one respondent clarifying the need for more information before the project starts.
- Technical information to increase the transparency of incentive or equipment eligibility (five respondents)
- More access to Program staff when questions arise (two respondents)
- More information on available audits (one respondent)
- Provide a list of participating Trade Allies (one respondent), which Focus on Energy currently offers

Program Application Process

Survey respondents who were involved in the incentive application process shared their experiences. Two-thirds of respondents (67%, n=48) who received a check in the mail reported receiving it within six weeks, with the remaining reporting that the check took seven to eight weeks (18%) or more than eight weeks (15%). Thirty-six percent of CY 2019 respondents (n=44) said the application paperwork was *very easy*, compared to 26% in CY 2016 (n=46, the difference was not statistically significant).

The 12 respondents who reported the paperwork was challenging (27% of all CY 2019 respondents) cited a variety of reasons:

- The amount of time needed to compile everything (five respondents)
- Difficulty tracking down model numbers, equipment specifications, or utility account information (four respondents)
- The application was more complicated than necessary (one respondent)
- It was the business' first application (one respondent)
- Respondent was brought in midway through the application process (one respondent)

When asked how satisfied respondents were with the Program or project support Energy Advisors provided, all of those who received support (n=29) were either *very satisfied* (89%) or *somewhat satisfied* (11%), and most respondents provided reasons for their satisfactory ratings:

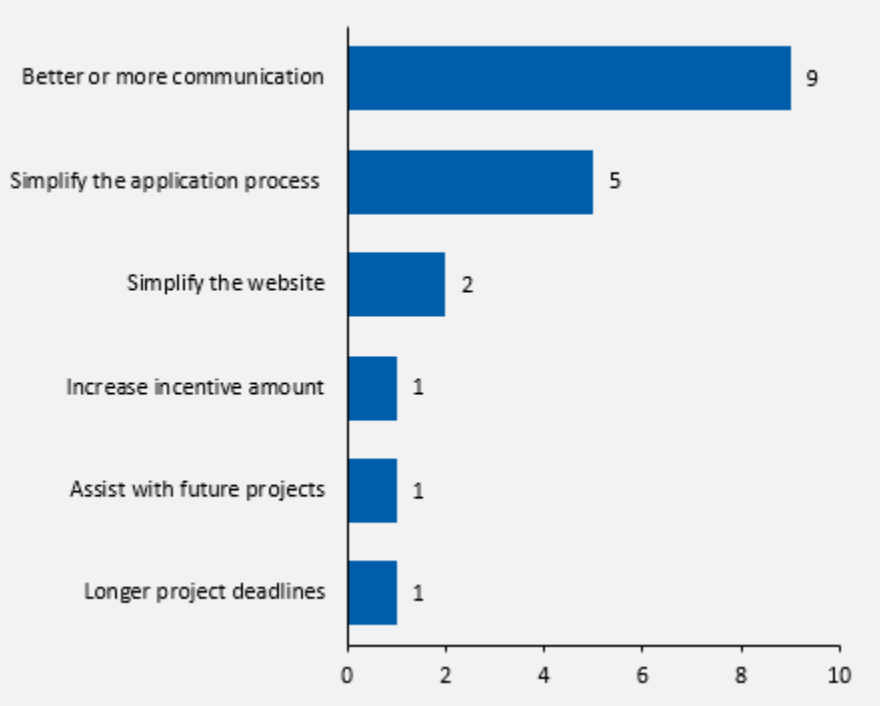
- The Energy Advisor was helpful in navigating the process (11 respondents).
- The Energy Advisor was responsive to questions (five respondents).
- The Energy Advisor was a strong line of communication for the Program (five respondents).
- Everything worked out and respondent received incentive (four respondents).

Program Improvement Recommendations

Of the 70 participants who responded to the annual Multifamily Energy Savings Program survey, 18 (26%) provided open-ended feedback, which the Evaluation Team coded into a total of 19 mentions. The most common suggestions for Program improvement involved improving communication (nine of 18 respondents) and simplifying the application process (four of 18 respondents). Comments about improving communications included requests for more and ongoing interaction with the program (directly or via contractors) about available incentives and incentive payment status.

Figure 60 shows participants' suggestions for improvement.

Figure 60. Multifamily Energy Savings Program Improvement Suggestions



Source: CY 2019 Multifamily Energy Savings Program Participant Survey Question J7: "Is there anything that Focus on Energy could have done to improve your overall experience with the Multifamily Energy Savings Program?" Multiple responses allowed (n=18)

Program Cost-Effectiveness

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

Table 72 lists the CY 2019 incentive costs for the Multifamily Energy Savers Program.

Table 72. Multifamily Energy Savers Program Incentive Costs

	CY 2019
Incentive Costs	$1,365,740

The Evaluation Team found that the CY 2019 Multifamily Energy Savers Program was cost-effective (1.74). Table 73 lists the evaluated costs and benefits.

Table 73. Multifamily Energy Savers Program Costs and Benefits

Cost and Benefit Category	CY 2019
Costs	
Administration Costs	$880,282
Delivery Costs	$896,793
Incremental Measure Costs	$3,338,070
Total Non-Incentive Costs	**$5,115,145**
Benefits	
Electric Benefits (kWh)	$3,105,224
Electric Benefits (kW)	$1,132,767
Gas Benefits	$2,948,947
Emissions Benefits	$1,720,294
Total TRC Benefits	**$8,907,232**
Net TRC Benefits	**$3,792,087**
TRC B/C Ratio	**1.74**

Evaluation Outcomes and Recommendations

To improve the Multifamily Energy Savings Program, the Evaluation Team identified the following outcomes and recommendations.

Outcome 1. Minor differences between the deemed parameters in the 2019 TRM and the values applied in the SPECTRUM database to calculate *ex ante* savings estimates exist because of rounding errors. For three impact samples, the *ex ante* savings estimates were slightly different than the *ex post* estimates because either the savings in SPECTRUM or the TRM value were rounded to the nearest whole integer. If the parameter that is rounded is a per-unit value then differences are multiplied by the number of units installed and can thus become more significant. The largest deviation from a realization rate of 100% due to this factor was 108%.

Recommendation. Review all values in SPECTRUM and the TRM to ensure the same, appropriate number of significant digits is used for all deemed savings parameters.

Outcome 2. The Program achieved its therm savings goal but did not achieve its electric savings or demand reduction goals. The Multifamily Energy Savings Program achieved 154% of its *ex ante* gross lifecycle savings goal but fell short of the electric savings (85% of goal) and the peak demand (87%) goals. The Program Implementer said this is the result of exhausting the incentive budget for natural gas-saving projects, and that many electric-saving projects were carried forward for payment in CY 2020.

Outcome 3. The Program Implementer's Energy Advisors play a key role in Program awareness, project initiation, and incentive application support for its multifamily customers. Participants frequently learn about the Multifamily Energy Savings Program incentives through either their contractor or a Focus on Energy staff member, and nearly half of CY 2019 participants had an Energy Advisor involved in project initiation. More participants received application paperwork support from an

Energy Advisor in CY 2019 (33%) than in CY 2016 (9%). All who interacted with an Energy Advisor were satisfied with the support received, with participants emphasizing Energy Advisors' help with navigating the process, their responsiveness when questions arose, and their communication levels throughout the process, as the primary reasons for their satisfactory ratings.

Outcome 4. The Program Implementer made several improvements to its energy assessment report and process but would benefit from tracking the number of assessments delivered annually. First, the Program Implementer revised its energy assessment process to limit in-person walkthroughs only to those buildings with the greatest energy-saving potential and provided remote energy assessments that involved the support of the building owner or property manager. Second, the Program Implementer revised the executive summary of its energy assessment report template to include a list of optimal energy-saving opportunities and clearly defined next steps to achieving energy savings. Third, the Program Implementer coordinated the use of a single assessment report template across all of its Energy Advisors.

These changes likely helped streamline outreach, and both the Program Administrator and Program Implementer believe the changes increased the Program's reach. Nevertheless, the Program Implementer reduced its Energy Advisor team from four in CY 2018 to three in CY 2019. In addition, the volume of site assessments is not tracked from year to year. Therefore, it is difficult to assess whether these changes have had an immediate effect on Program participation.

Recommendation. To monitor the effects of these changes to the assessment report and process, consider tracking the number of energy assessments each Energy Advisor delivered to customers as well as the conversion rate of customers who took action as a result of receiving an assessment.

New Homes Program

Through the New Homes Program, in operation since 1999, Focus on Energy provides information, assistance, and incentives to builders in Wisconsin. The Program offers incentives for homes that meet Focus on Energy's prescriptive performance and modeled energy performance requirements, which are expressed as a percentage of energy savings (better) than the minimum requirements of the Wisconsin Uniform Dwelling Code (WUDC).

In CY 2019, Focus on Energy paired builders with energy experts, known as Building Performance Consultants (BPCs), to construct new homes that are between 25% and 100% more efficient than homes built to meet the minimum requirements of the WUDC. In CY 2019, builders could receive an incentive for homes that are at least 30% more efficient than code. Builders could receive Program certification, but no incentives, for homes that are between 25% and 29.9% more efficient than code.

The Program's tiered design also offers increasing incentives for more efficient homes, with the highest incentives offered for homes that are energy-neutral.[43] Though Program requirements are expressed as percentage better than code, since CY 2018 Focus on Energy has measured the energy savings of Program homes from a market characteristics baseline. These savings are calculated directly by the REM/Rate modeling software used by the Program's BPCs. The market characteristics baseline is based on research conducted in CY 2017.[44]

Focus on Energy delivers the Program throughout Wisconsin through the Program Administrator (APTIM), the Program Implementer (Slipstream), participating Trade Allies (home builders), and BPCs. Participating home builders hire BPCs affiliated with the Program to guide them on better building techniques and to model and verify the new homes' energy performance using REM/Rate. Focus on Energy also offers training on advanced building techniques to help home builders meet Program requirements and construct more efficient homes. This training is also open to nonparticipating builders and subcontractors.

Because the New Homes Program has promoted the construction of energy-efficient homes in Wisconsin for 20 years, the Evaluation Team is examining the Program's effect on nonparticipating home construction in the state. This dynamic is described as the market effect of the Program.

Table 74 lists actual Program spending, savings, participation, and cost-effectiveness in CY 2019.

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[43] An energy-neutral home is designed and built to consume minimal energy. The total annual amount of energy used, as modeled with REM/Rate software, is equal to the amount of renewable energy produced on site.

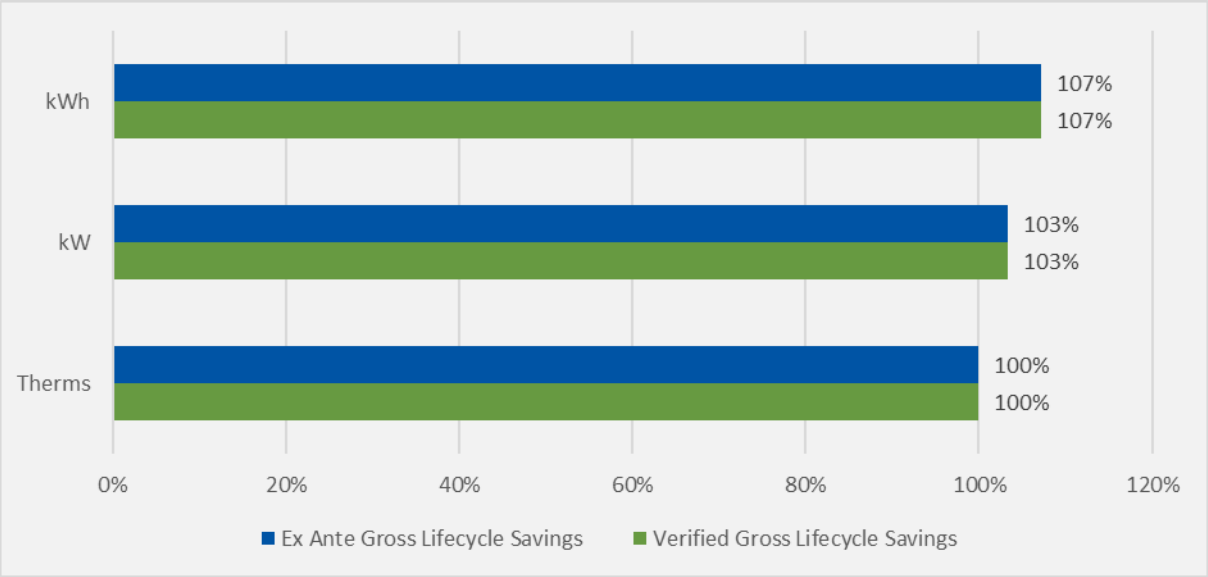
[44] Seventhwave. October 2017. *New Homes Baseline Final Report*. Available online: *https://www.focusonenergy.com/sites/default/files/2018-04/New%20Homes%20Baseline%20and%20Market%20Characterization%20Study.pdf*

Table 74. New Homes Program Summary

Item	Units	CY 2018	CY 2019
Incentive Spending	$	$1,966,850	$1,386,950
Participation	Number of Participants	2,403	2,382
Verified Gross Lifecycle Savings	kWh	53,862,060	85,789,920
	kW	571	765
	therms	13,788,450	14,000,850
Verified Gross Lifecycle Realization Rate	% (MMBtu)	100%	100%
Annual NTG Ratio	% (MMBtu)	100%	4%
Net Annual Savings	kWh/year	1,795,402	0
	kW	571	0
	therms/year	459,615	23,335
Net Lifecycle Savings	MMBtu	1,562,622	70,004
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	0.99	0.20

Figure 61 shows the percentage of gross lifecycle savings goals achieved by the New Homes Program in CY 2019. The Program achieved or exceeded the electric and natural gas savings goals.

Figure 61. New Homes Achievement of CY 2019 Gross Lifecycle Savings Goals



The 100% *ex ante* gross lifecycle savings reflects the Program Implementer's contract goals for CY 2019. Verified gross lifecycle savings contribute to the Program Administrator's portfolio-level goals.

Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted impact and process evaluations of the New Homes Program in CY 2019 and began to study the market effects of the Program. The Team designed its EM&V approach to integrate multiple perspectives in assessing Program performance. Table 75 lists specific data collection activities and sample sizes used in the evaluations.

Table 75. CY 2019 Data Collection Activities and Sample Sizes

Activity	CY 2019 Sample Size (n)
Tracking Database Review	Census
Billing Analysis	1,895 gas participants 1,700 electric participants 4,242 gas nonparticipants 3,863 electric nonparticipants
Program Actor Interviews	2
Builder Interviews	15
Subcontractor Interviews	10
REM/Rate Database Development	26,959

Tracking Database Review

The Evaluation Team's review of the census of Program SPECTRUM tracking data involved two tasks:

- Thoroughly review the data to ensure that SPECTRUM totals matched the totals reported by the Program Administrator
- Check for complete and consistent application of data fields (including measure names, application of first-year savings, and application of effective useful lives)

Billing Analysis

The Evaluation Team conducted billing analyses of Program and non-Program homes to estimate the Program's net electric and natural gas savings for each Program certification level. Using a year of post-construction billing data from utilities where Program homes were constructed in CY 2018, the Team determined energy consumption for Program and non-Program homes. The Team used the difference in consumption per square foot between the two home types to determine the CY 2019 electric and natural gas NTG rates.

Because of unexpectedly low results from this analysis, the Evaluation Team intends to conduct additional analysis of billing data and market information during CY 2020.

Program Actor Interviews

The Evaluation Team interviewed the Program Administrator and the Program Implementer in November 2019. The interviews focused on high-level changes in CY 2019 and the outcomes of those changes, general Program performance, including areas of success and potential concerns, potential changes for CY 2020, and market effects of the Program.

Builder Interviews

The Evaluation Team conducted interviews with 10 builders who participated in the New Homes Program in CY 2019 and five builders who had not participated in the Program. The interviews focused on building practices as well as the new homes construction market and Program market effects.

Contractor Interviews

The Evaluation Team conducted interviews with 10 subcontractors who worked on Program-certified homes in CY 2019. The Team spoke with four insulators, three framers, and three heating and cooling contractors. The interviews focused on construction practices as well as the new homes construction market and Program market effects.

REM/Rate File Database

The Evaluation Team built a database of Program home characteristics using historical REM/Rate model files, which contain individual home characteristics. The Team analyzed the characteristics of 26,959 Program homes between 2000 and 2019 to determine trends in Program home characteristics.

To develop this database, the Evaluation Team received 39,527 REM/Rate model files from the Program Implementer and was able to capture 36,424 of these files (92%) in a database. The Team was unable to capture all files in the database as some files could not be opened. Of the files captured in the database, 28,411 (78%) were for the New Homes Program (the Implementer provided model files for both the Home Performance with ENERGY STAR and New Homes Programs). Of these 28,411 files, 5% were for the same address and, once the Evaluation Team removed these files, 26,959 homes remained in the database.

Impact Evaluation

The Evaluation Team used the following approaches to measure the impact of the New Homes Program:

- Tracking database review
- Billing analysis

Evaluation of Gross Savings

The Evaluation Team assessed the Program's gross savings through the tracking database review in which the Team reviewed the census of the CY 2019 New Homes Program tracking data for completeness and accuracy. The Team found the *ex ante* EUL for Tier 1 gas homes to be 29.999, which is slightly less than the measure EUL of 30 years. Because this difference was likely due to rounding and had a negligible effect on the Tier or Program savings and realization rates, the Team accepted the *ex ante* savings.

Verified Gross Savings Results

Table 76 lists the annual and lifecycle realization rates for the CY 2019 Program. Overall, the Program achieved a first-year evaluated realization rate of 100%, weighted by total (MMBtu) energy savings.

Table 76. CY 2019 New Homes Program Annual and Lifecycle Realization Rates

Certification Level	Annual Realization Rate				Lifecycle Realization Rate			
	kWh	kW	therms	MMBtu	kWh	kW	therms	MMBtu
Electric - Level 1-25 to 29.9% Better Than Code	100%	100%	N/A	100%	100%	100%	N/A	100%
Electric - Level 2-30 to 34.9% Better Than Code	100%	100%	N/A	100%	100%	100%	N/A	100%
Electric - Level 3-35 to 99.9% Better Than Code	100%	100%	N/A	100%	100%	100%	N/A	100%
Gas - Level 1-25 to 29.9% Better Than Code	100%	100%	100%	100%	100%	100%	100%	100%
Gas - Level 2-30 to 34.9% Better Than Code	100%	100%	100%	100%	100%	100%	100%	100%
Gas - Level 3-35 to 99.9% Better Than Code	100%	100%	100%	100%	100%	100%	100%	100%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Table 77 lists the *ex ante* and verified annual gross savings for the Program for CY 2019 by measure type.

Table 77. CY 2019 New Homes Program First-Year Gross Savings Summary

Certification Level	*Ex Ante* Gross First Year			Verified Gross First Year		
	kWh	kW	therms	kWh	kW	therms
Electric - Level 1-25 to 29.9% Better Than Code	12,538	4	0	12,538	4	0
Electric - Level 2-30 to 34.9% Better Than Code	39,294	13	0	39,294	13	0
Electric - Level 3-35 to 99.9% Better Than Code	102,372	25	0	102,372	25	0
Gas - Level 1-25 to 29.9% Better Than Code	415,505	107	71,959	415,505	107	71,959
Gas - Level 2-30 to 34.9% Better Than Code	1,381,216	363	227,513	1,381,216	363	227,513
Gas - Level 3-35 to 99.9% Better Than Code	908,748	254	167,223	908,748	254	167,223
Total First Year	**2,859,673**	**765**	**466,695**	**2,859,673**	**765**	**466,695**

Table 78 lists the *ex ante* and verified gross lifecycle savings by measure type for the Program in CY 2019.

Table 78 CY 2019 New Homes Program Lifecycle Gross Savings Summary

Certification Level	*Ex Ante* Gross Lifecycle			Verified Gross Lifecycle		
	kWh	kW	therms	kWh	kW	therms
Electric - Level 1-25 to 29.9% Better Than Code	376,140	4	0	376,140	4	0
Electric - Level 2-30 to 34.9% Better Than Code	1,178,820	13	0	1,178,820	13	0
Electric - Level 3-35 to 99.9% Better Than Code	3,071,160	25	0	3,071,160	25	0
Gas - Level 1-25 to 29.9% Better Than Code	12,464,880	107	2,158,770	12,464,880	107	2,158,770
Gas - Level 2-30 to 34.9% Better Than Code	41,436,480	363	6,825,390	41,436,480	363	6,825,390
Gas - Level 3-35 to 99.9% Better Than Code	27,262,440	254	5,016,690	27,262,440	254	5,016,690
Total Lifecycle	**85,789,920**	**765**	**14,000,850**	**85,789,920**	**765**	**14,000,850**

Evaluation of Net Savings

The Evaluation Team conducted a billing analysis with a nonparticipant group of customers using new residential addresses in similar geographic areas as Program homes[45] that were not certified by the New Homes Program. This provided a representative group of homes to establish the current market baseline energy use and estimate net savings for the Program. The nonparticipant control group helped to account for other factors occurring in the market such as freeridership (determined by comparing nonparticipant market baseline with an efficient baseline) and spillover (determined by measuring total energy changes from one year to next, which included additional improvements). The Team estimated net savings by comparing energy usage per square foot for participants with that of nonparticipant homes built during a similar time period.

The Evaluation Team defined the analysis period for both participant and nonparticipant homes as the period from January 2019 through December 2019. This was the latest annual period with the most complete billing data for all utilities.

Appendix I provides more detail about the results and the methodologies used in the billing analyses, including the Team's criteria for screening billing analysis samples.

Billing Analysis

To conduct the billing analysis, the Evaluation Team used regression models to measure savings achieved by Program homes. Specifically, the Team calculated savings by comparing the energy intensity of the participating Program homes with the energy intensity of similar nonparticipating new homes over the same period, accounting for variables such as weather and square footage of home.

The Evaluation Team compared the home square footage of participant and nonparticipant groups. From the screened billing analysis samples, the Team summarized the analyzed 2019 post-period usage and divided it by the square footage to obtain a kWh per square foot savings estimate for each customer. The difference between the participant and nonparticipant kWh per square foot yielded the net savings. Overall, electric participants averaged 8% and gas participants averaged 19% of the average expected savings.

lists the NTG ratios estimated from the billing analysis. As the table shows, NTG ratios were 0% for electric savings and 5% for natural gas savings.

Table 79 lists the NTG ratios estimated from the billing analysis. As the table shows, NTG ratios were 0% for electric savings and 5% for natural gas savings.

[45] For large utilities, the billing analysis excluded nonparticipant new homes that were not built in the same zip codes as participating homes. Full screening criteria are provided in *Appendix I*.

Table 79. CY 2015 Program Billing Analysis Results

Savings Type	NTG Rate
Electricity	0%
Gas	5%

The following sections describe the results for each billing analysis the Evaluation Team conducted. *Appendix I* contains additional details on the methodology, attrition, and results for these analyses.

The Evaluation Team notes that these NTG results do not reflect savings that the Team and Focus on Energy staff expected to find after the Program implemented a new design in CY 2018. Because of these unanticipated findings, the Team intends to perform additional analyses of billing data and market information during CY 2020 to determine if the result is from the program design, market shifts, or evaluation methodology.

As described below in the Market Effects section, the Evaluation Team will also continue to assess the Program's long-term impact on the residential new construction market, which may be resulting in nonparticipant spillover, or market effects.

Billing Analysis for Electric Savings

The Evaluation Team used PRISM models to estimate NTG rates and the standard errors around the savings estimates for each program. Table 66 shows electric net energy savings as well as the NTG rates for each measure. Overall, the billing analysis results showed that participants had average electric savings of -0.226 kWh per square foot. The Program tracking data showed average expected savings of 0.337 kWh per square foot, yielding a negative NTG rate (translated into an applied NTG rate of 0%).

Billing Analysis for Gas Savings

Table 81 shows the *ex ante* and *ex post* gas net energy savings as well as the NTG rates for each measure. Overall, participants achieved average savings of 0.0004 therms per square foot. The Program tracking data showed average expected savings of 0.089 therms per square foot, yielding a NTG rate of 5%.

Table 80. New Homes Program Electric Net Adjustment by Measure

Participation	Percent Better than Code	N	Average Usage kWh	Average SQFT	Actual Consump. kWh/ SQFT	Expected Savings		Baseline Consumption		Actual Savings		Percentage Savings		Net Adjust.
						kWh	kWh/ SQFT	Expected kWh	Actual kWh	kWh	kWh/ SQFT	Expected	Actual	
No	25% to 29.9%	3,666	9,555	2,507	3.812									
No	30% to 34.9%	3,834	9,462	2,405	3.935									
No	35% to 99.9%	3,577	9,466	2,391	3.959									
No	**All**	**3,863**	**9,493**	**2,435**	**3.898**									
Yes	25% to 29.9%	551	8,600	1,984	4.335	573	0.289	9,173	7,561	-1,039	-0.524	6%	-13.7%	-181%
Yes	30% to 34.9%	843	9,661	2,357	4.099	814	0.345	10,475	9,274	-387	-0.164	8%	-4.2%	-48%
Yes	35% to 99.9%	306	10,507	2,691	3.904	1,025	0.381	11,531	10,655	148	0.055	9%	1.4%	14%
Yes	**All**	**1,700**	**9,469**	**2,296**	**4.124**	**774**	**0.337**	**10,243**	**8,950**	**-519**	**-0.226**	**8%**	**-5.8%**	**-67%**

Table 81. New Homes Program Gas Net Adjustment by Measure

Participation	Percent Better than Code	N	Average Usage Therms	Average SQFT	Actual Consump. therms/ SQFT	Expected Savings		Baseline Consumption		Actual Savings		Percentage Savings		Net Adjust.
						Therms	Therms/ SQFT	Expected Therms	Actual Therms	Therms	Therms/ SQFT	Expected	Actual	
No	25% to 29.9%	4,242	952	2,422	0.393									
No	30% to 34.9%	4,242	926	2,,340	0.396									
No	35% to 99.9%	4,242	917	2,320	0.396									
No	**All**	**4,242**	**933**	**2,364**	**0.395**									
Yes	25% to 29.9%	623	816	1,980	0.412	162	0.082	978	779	-37	-0.019	17%	-4.8%	-19%
Yes	30% to 34.9%	966	909	2,353	0.387	207	0.088	1117	932	22	0.009	19%	2.4%	11%
Yes	35% to 99.9%	306	1017	2,731	0.372	275	0.101	1292	1080	63	0.023	21%	5.9%	23%
Yes	**All**	**1,895**	**896**	**2,291**	**0.391**	**203**	**0.089**	**1099**	**905**	**9**	**0.004**	**19%**	**1.0%**	**5%**

Table 82 shows the annual net demand and energy impacts (kWh, kW, and therms) by measure category for the Program.

Table 82. New Homes Program Annual Net Savings

Certification Level	First-Year Net		
	kWh	kW	therms
Electric - Level 1-25 to 29.9% Better Than Code	0	0	0
Electric - Level 2-30 to 34.9% Better Than Code	0	0	0
Electric - Level 3-35 to 99.9% Better Than Code	0	0	0
Gas - Level 1-25 to 29.9% Better Than Code	0	0	3,598
Gas - Level 2-30 to 34.9% Better Than Code	0	0	11,376
Gas - Level 3-35 to 99.9% Better Than Code	0	0	8,361
Total First Year	**0**	**0**	**23,335**

Table 83 lists the lifecycle net demand and energy impacts (kWh, kW, and therms) by measure category for the Program.

Table 83. New Homes Program Lifecycle Net Savings

Certification Level	Lifecycle Net		
	kWh	kW	therms
Electric - Level 1-25 to 29.9% Better Than Code	0	0	0
Electric - Level 2-30 to 34.9% Better Than Code	0	0	0
Electric - Level 3-35 to 99.9% Better Than Code	0	0	0
Gas - Level 1-25 to 29.9% Better Than Code	0	0	107,939
Gas - Level 2-30 to 34.9% Better Than Code	0	0	341,270
Gas - Level 3-35 to 99.9% Better Than Code	0	0	250,835
Total Lifecycle	**0**	**0**	**700,043**

Market Effects

For the CY 2019-CY 2022 quadrennium, the Evaluation Team is conducting a market effects study that seeks to determine how the New Homes Program affects the construction of new homes built in Wisconsin that are not certified by the Program (i.e., non-Program homes). Each year the Team will conduct research to inform this study and will ultimately ask a Delphi panel of market experts to estimate the Program's market effects based on findings from the research.

Although the Team originally planned to convene the Delphi panel at the end of the quadrennium, the unexpected CY 2019 NTG results suggest a need to better understand the Program's impact on the market sooner. The Team will work with the PSC and Program Administrator to reconsider the appropriate timing of the market effects deliverable.

Process Evaluation

The Evaluation Team focused the process evaluation on the following key topics:

- Program design, management, and goals
- Builder and contractor characteristics
- Construction practices
- Builder and contractor training participation
- Program and home marketing
- New homes construction market
- Program market effects
- Program challenges and market barriers

Program Design, Delivery, and Goals

Through the CY 2019 New Homes Program, Focus on Energy offered incentives to participating builders for constructing homes that are at least 30% more efficient than minimum WUDC requirements. The incentives were designed to offset both the cost of constructing an energy-efficient home and the cost of hiring a BPC to certify the home.

Under a tiered incentive structure, builders were rewarded for building more efficient homes, with the highest incentive level offered for homes that were energy-neutral. Builders could also receive Program certification for homes that were between 25% and 29.9% more efficient than the WUDC, though they did not receive incentives at this participation level. To receive incentives and/or Program certification, builders were required to work with an accredited BPC.[46]

Table 84 lists the incentives for various performance levels in CY 2019. Incentives varied not only by performance level but also according to whether space heating systems were fueled by natural gas provided though a Focus on Energy participating utility. In CY 2019, incentives were reduced from CY 2018 levels for budgetary reasons and to maintain the cost-effectiveness of the Program. The Program Implementer reported that one high-volume longstanding participant builder dropped out of the Program as a result.

[46] Building Performance Consultants must possess RESNET (Residential Energy Services Network) certification or an equivalent and approved certification.

Table 84. CY 2019 Incentive Structure

Certification Level	CY 2018 Incentives		CY 2019 Incentives	
	Electric Only Homes	Electric and Natural Gas Homes	Electric Only Homes	Electric and Natural Gas Homes
25%–29.9% more efficient than code	$0	$0	$0	$0
30%–34.9% more efficient than code	$350	$1,000	$350	$600
35%–99.9% more efficient than code	$550	$2,000	$550	$1,000
Energy Neutral (or 100% more efficient than code)	$1,000	$5,000	$1,000	$2,300

In addition to the energy performance requirements, Program-certified homes must also meet several prescriptive requirements, such as maintaining whole-home ventilation and limitations on the types of hearth systems that can be put in homes (for example, wood-burning fireplaces are not allowed in Program-certified homes).

Focus on Energy also offered Program training on advanced building practices to all builders and subcontractors, whether they participated in the Program or not.

Program Management and Delivery Structure

Focus on Energy delivers the Program throughout Wisconsin through the Program Administrator, the Program Implementer, BPCs, and participating home builders.

Home builders hire a BPC-affiliated with the Program to conduct at least two site visits during home construction to inspect construction and verify the home's energy performance. The BPC first visits the site at the framing stage and checks the insulation then visits again when the home is 100% complete to conduct a blower door test, ventilation capacity test, and other verification of Program standards.

The Program Implementer maintains communication with BPCs via a newsletter (released three times per year), Program bulletins, and one-on-one discussions. In CY 2019, Focus on Energy sought to expand its roster of participating BPCs through outreach and training.

After each site visit, the BPC submits a report of findings to the home builder. The BPC may recommend corrections that the builder needs to make prior to submitting final paperwork to the Program Implementer. After reviewing, the Program Implementer forwards the paperwork to the Program Administrator for final approval and payment of the incentive to the builder.

Program Goals

The Program's overall objective is to encourage builders to build homes that are more energy-efficient than homes generally constructed in the Wisconsin market. For CY 2019, Focus on Energy set the following gross lifecycle savings goals:

- Demand reduction of 740 kW
- Lifecycle electric savings of 80,000,000 kWh
- Lifecycle natural gas savings of 14,000,000 therms

The evaluation produced energy saving estimates that are net savings. The billing analysis method did not address gross savings and therefore the verified gross lifecycle savings are the same as the *ex ante* gross lifecycle savings. From that perspective, the Program met its goals but not in terms of net lifecycle savings.

Builder and Contractor Characteristics

The Evaluation Team interviewed 15 builders, 10 of whom participated in the Program in CY 2019. The Team also interviewed 10 contractors who worked on Program homes in CY 2019: four insulators, three framers, and three HVAC equipment installers. These builders and subcontractors reflected a wide range of businesses, including high-volume builders, small custom builders, relatively large-volume subcontractors, and smaller-volume subcontractor businesses.

Participant Builder Characteristics

Participating builders comprise high- and relatively low-volume builders. Additionally, these builders build both spec homes (homes built and sold upon completion) and custom homes (homes commissioned by a homebuyer before construction begins). In CY 2019, 153 individual builders participated in the New Homes Program, completing 2,382 homes.[47]

In CY 2019, the Program had one very high-volume builder who completed 549 homes, accounting for 23% of the homes certified by the Program. This builder constructed both custom and spec homes, did not construct any non-certified homes, and did not participate in any other certification programs. This builder was interviewed by the Evaluation Team.

Medium-volume builders (certifying between 11 and 150 homes) constructed 1,522 homes (64% of CY 2019 Program homes).[48] According to interviews, most of these builders constructed both spec and custom homes (one built only spec homes) and generally did not participate in other certification programs (one builder participates in the U.S. Department of Energy Zero Energy Ready Home program). In addition, five of the six medium-volume builders interviewed constructed both certified and non-certified homes; however, most of the homes were certified.

Smaller-volume builders (certifying 10 or fewer homes) constructed 311 homes (13% of CY 2019 Program homes) and were the most numerous type of builder in the Program. Of the three smaller-volume builders interviewed, two built both custom and spec homes and one built only custom homes. Two of these builders said they built both certified and non-certified homes, although most are certified. One of these builders also participated in the ENERGY STAR Homes Program. One smaller-volume builder said that 100% of the homes constructed were certified.

Table 85 presents the characteristics of participant home builders in CY 2019.

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[47] The median number of homes built by individual builders was three, and the average was 16. Fifty-three builders certified only one home in CY 2019.

[48] No builders certified between 150 and the 549 homes certified by the Program's largest builder.

Table 85. CY 2019 Participant Builder Characteristics

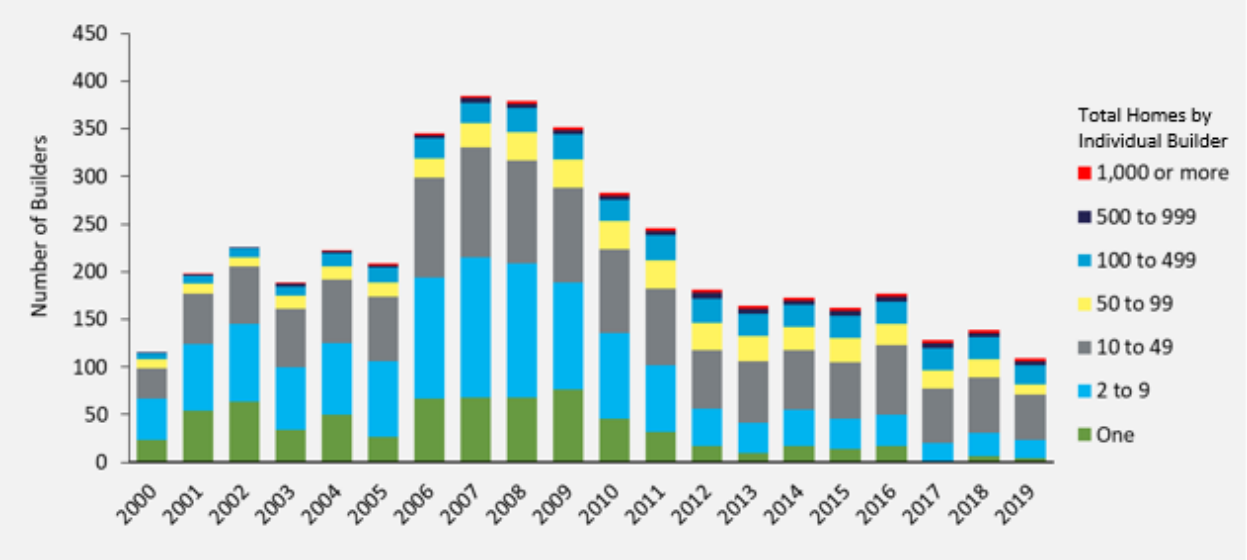
Number of Homes Certified by Builder in CY 2019	Very High Volume	Medium Volume		Smaller Volume
	549	51-150	11-50	10 or fewer
Number of Interviews	1	2	4	3
Number of CY 2019 Builders	1	11	28	113
Percentage of CY 2019 Homes	23%	38%	26%	13%
Type of Home (Custom/Spec)	Both	Both	3 both, 1 spec only	2 both, 1 custom only
Construction of Non-Program Homes	No	No	3 yes, 1 no	2 yes, 1 no
Other Certifications		1: DOE NZER		1: ENERGY STAR

Historical Builder Participation

The Evaluation Team used the REM/Rate database, which is composed of archived building data dating to program inception, of Program homes to analyze historical builder characteristics. In Figure 62 and Figure 63, builders are grouped by the total number of homes they have built since joining the Program.

As shown in Figure 62, high- and medium-volume builders (builders certifying 10 or more homes) have seen relatively consistent participation since the beginning of the Program. In contrast, the participation of lower-volume builders (certifying nine or fewer homes) has been steadily dropping beginning in 2008.

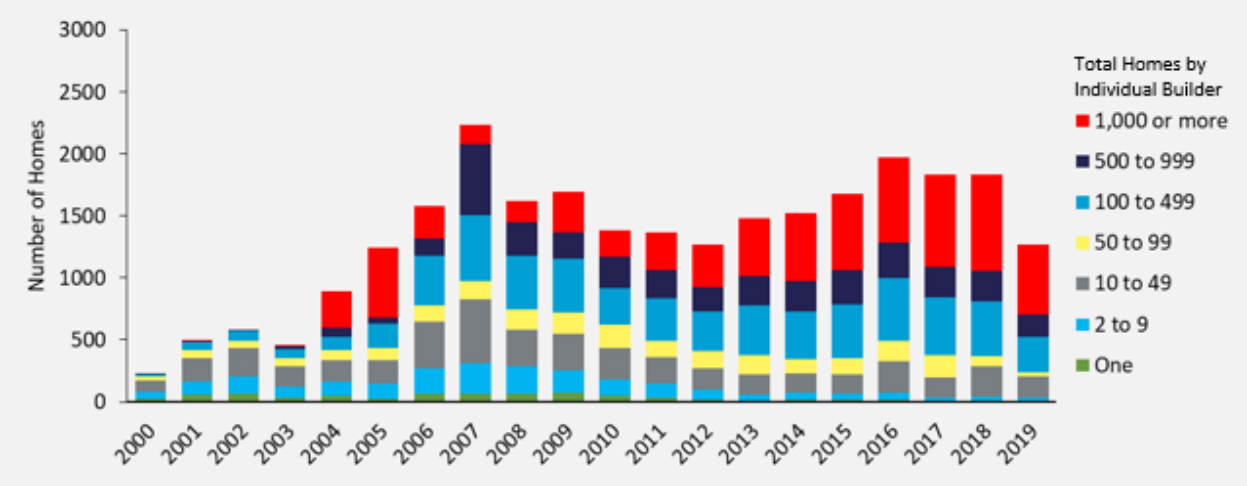
Figure 62. Historical Number of Participating Builders



This figure is based on REM/Rate files included in the historical database. Because not all homes were able to be captured in this database, it underrepresents the total number of participating builders. Data for 2019 is partial.

Though the highest-volume builders continue to be a relatively small fraction of participating builders, they continue to contribute significantly to the overall number of certified homes, as shown in Figure 63.

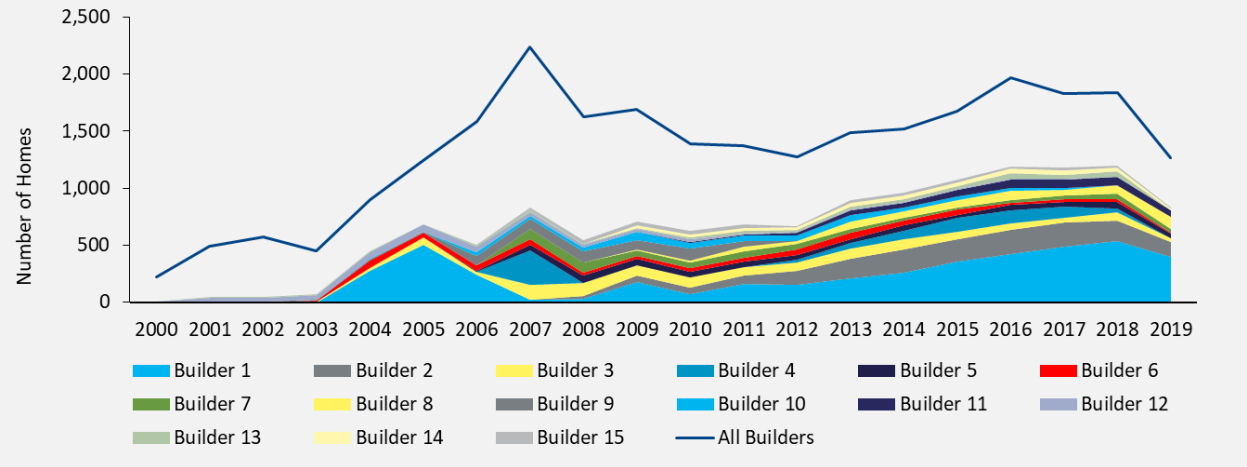
Figure 63. Historical Number of Certified Homes



This figure is based on REM/Rate files included in the historical database. Because not all homes could be captured in this database, it underrepresents the total number of certified homes. Data for 2019 is partial.

The Evaluation Team also examined the 15 builders who certified the highest number of homes since Program inception. As shown in Figure 64, these top builders have historically made up a large portion of the overall number of certified homes, particularly in recent years. Individual builders joining the Program in 2005 and 2007 significantly contributed to overall Program volume in those years.

Figure 64. Top 15 Historical Builders



This figure is based on REM/Rate files included in the historical database. Because not all homes could be captured in this database, it underrepresents the total number of participating builders.

Difference Between Certified and Non-Certified Homes

The Evaluation Team asked the five participating builders who built both certified and non-certified homes why they built both types and how these homes differed. Their reasons related primarily to homeowner preference when designing custom homes. Two builders said that all of their homes were

essentially the same, but three pointed to specific differences between their certified and non-certified homes:

- Custom homebuyer decisions to keep cost down, such as using lower levels of insulation, prevent homes from meeting the Program's performance criteria (3 builders)
- Custom homebuyer preferences to install wood-burning fireplaces, which are not allowed by the Program (2 builders)
- Home construction style, such as having conditioned space under the garage (1 builder)

Nonparticipant Builder Characteristics

The Evaluation Team contacted a sample of five nonparticipating builders from the sample frame of 793 builders identified on Wisconsin's Home Builders Association (HBA) websites, focusing on counties with the most construction activity as determined by construction permits. The Team asked these builders about the number of homes they built, the type of homes, if they had heard of the New Homes Program, and if they had participated in any other new home certification programs.

As shown in Table 86, the Team interviewed only smaller- and medium-volume nonparticipant builders who built primarily custom homes. Most of these builders were aware of the New Homes Program, though none had previously participated. None had built more than 51 homes in CY 2019. As noted above, participating builders who constructed more than 51 homes in CY 2019 accounted for 61% of the Program volume that year.

Table 86. Nonparticipant Builder Characteristics

Number of Homes Built in CY 2019	11-50	10 or fewer
Number of Interviews	2	3
Type of Home (Custom/Spec)	Both (mostly custom)	Custom Only
Aware of New Homes Program	Yes	3 Yes, 1 No
Other Certifications		1: ENERGY STAR

When asked what it would take for them to participate in the Program, the nonparticipant builders said they would need more information about it. One builder said, "I don't know enough about the Program. I have never looked into it and no one has reached out to me to join. It's really hard to make time for it, but I am really interested in learning how to get certified."

Contractor Characteristics

Subcontractor data provided by the Program Implementer indicated that 59 insulators, 132 HVAC contractors, and 289 framers worked on Program-certified homes in CY 2019. The Evaluation Team interviewed four insulators, three HVAC contractors, and three framers. As illustrated in Table 87, insulators worked on more Program homes than did framers or HVAC contractors. Thus, as the interview and Program Implementer data indicate, though fewer firms provide insulation services, these firms took on more jobs than the relatively more numerous HVAC contractors and framers. For all contractor types, a small number of contractors worked on a large number of homes, resulting in the average

number of homes worked on being higher than the median number. For example, seven of the 59 insulators worked on 79% of the Program homes.

Table 87. Contractor Characteristics

Contractor	Number of Interviews	Average Program Home Worked on per Firm	Median Program Home Worked on per Firm	Individual Firms in Implementer Data
Insulators	4	61	5	59
HVAC Contractors	3	27	4	132
Framers	3	11	3	289

All subcontractors said they typically had longstanding relationships with builders. One HVAC contractor said, "We are really not interested in whoever can get [to us] first […] we have been working with [most builders] for 15 to 20 years plus." Two contactors said they also worked with new builders, as they "occasionally get random, independent" builders.

When asked why home builders selected them over other contractors, seven contractors said because they had a good reputation and four because their work quality was known to builders. Only two said they were selected to work on homes because of their competitive pricing. As noted in the *Low Supply of Labor* section below, there is currently a high demand for labor in the Wisconsin new construction market.

The Evaluation Team also asked contractors if they generally worked on spec or custom homes. Contractors mostly worked on custom homes (six mostly worked on custom homes and one worked only on custom homes). Three contractors, an insulator, a framer, and an HVAC contractor said their work was split between custom and spec homes.

Contractors Work on Program and Non-Program Homes

The Team asked if contractors worked on both Program and non-Program homes, and if so, how their practices differed between the two. All contractors worked on both types of homes. HVAC contractors said Program-certified homes and non-certified homes primarily differed in the use of two-stage furnaces, which they said were more likely to be placed in certified homes. None of the insulation contractors thought certified and non-certified homes differed, but one framing contractor suggested that certified homes were more likely to be framed so the home could be better insulated. Table 88 lists the differences in practices by contractor.

Table 88. Difference in Contractor Practice: Certified and Non-Certified Homes

Contractor Type	Difference		Type of Difference
	No	Yes	
Framing	2	1	Homes framed to allow installation of better insulation
Insulation	4	0	Always install insulation in similar ways
HVAC	0	3	Non-certified homes less likely to use efficient gas furnaces or two-stage furnaces

Contractor Engagement with the New Homes Program

Of the 10 contractors interviewed, eight were typically made aware the home would be Focus on Energy-certified when working on it. Two contractors, one framer, and one insulator said they were not always notified but that their practice was to generally build to Focus on Energy standard so it did not matter if they knew the home was to be certified or not. The framer said, "Normally, everything we do is to Focus on Energy standard. Some of the builders don't care, but I still do it because it makes sense to me." The insulator said, "Our standard practice always meets [Focus on Energy] requirements. This standard is R-50 insulation in the attic and R-19 in walls with 1-inch foam insulation to get above R-20."[49]

Seven contractors engaged with BPCs when working on program-certified homes, but two HVAC contractors said this interaction was fairly limited. One contractor said the BPC would pass advice directly on to the builder, and another engaged with the BPCs only when "there are problems." Six contractors said BPCs had an effect on their practices, and four said BPCs did not affect how they built homes. An insulation contractor said it was "pretty baseline to pass Focus on Energy requirements."

The six contractors who said the BPCs had an effect on their practices described these effects:

- Improvements in framing techniques, such as framing homes to allow more insulation; one framer said, "We are more conscious to use less wood and use more insulation. We used to throw wood at [the home]" (3 framers)
- Improvements in sealing the homes, such as using foam board insulation or identifying air leaks (3 insulators)
- Improvement in the installation of HVAC equipment and proper sealing of ducts (1 HVAC contractor)

Effect of Program on Contractor Practices in Non-Program Homes

The Evaluation Team also asked contractors if the New Homes Program had affected how they insulated or framed or in the type of equipment was installed in non-Program homes. As shown in Table 89, three contractors said their work on Program homes had an impact on how they framed, insulated, or installed HVAC equipment in non-Program homes.

Table 89. Effect of New Homes Program on Non-Program Homes

Contractor Type	Effect		Type of Effect
	No	Yes	
Framing [a]	1	1	All homes built to the same, higher standard (no specifics given)
Insulation	3	1	Always install insulation to Focus on Energy standards
HVAC	2	1	Utilize feedback from BPC reports to adjust best practices in non-program homes

[a] One framer did not know.

[49] The insulator also noted that his company offers "upgrades for everything, and usually the Focus on Energy builders take the upgrades. For ceiling: install air shoots in every channel and seal everything with fiberglass insulation. Some builders go to R-60."

One framer, who had said there was no difference in how his company framed certified and non-certified homes, said his interactions with BPCs, especially when the company first started working on certified homes, had "definitely affected how we framed homes. Focus on Energy makes sense for a better home and smart framing practices."

One insulator, who had said his practices did not differ between Program and non-Program homes, said the Program had affected how he insulated Program homes. The insulator primarily used spray foam insulation and frequently interacted with BPCs, who acted as "a kind of teacher" to improve practices. This insulator said that, though all of the company's homes were insulated the same way, his company was "10% higher in prices than [other insulators]" and that when working on non-certified homes, "50% of the time we have clients who go elsewhere when we tell them that we are going to treat the home as a Focus on Energy home."

An HVAC contractor said that, though Program and non-Program homes differed, primarily in the lower efficiency equipment used in non-Program homes, he also applied best practices learned through engagement with BPCs when installing equipment and sealing ductwork in non-Program homes. The contractor said: "The best practices we learned are really sealing of the ductwork with spray foam and testing it to make sure there are no air gaps."

The Evaluation Team also asked participant and nonparticipant builders if they knew if their subcontractors worked on both Program and non-Program homes. Six participant builders said their subcontractors worked on both types (four did not know). One participant builder said Focus on Energy helped nonparticipant builders because subcontractors "take up some of the practices learned with Program-built homes and apply them on other homes. We got those practices set in their heads."

Importance of Contractors for Building Energy-Efficient Homes

All 10 participant builders and all five nonparticipant builders said they relied on knowledgeable subcontractors to build their homes. When asked what trade or type of contractor was most essential for the energy efficiency of the home, most builders said insulators were most important and some said framers were important. One builder said, "It would not be possible to put R-19 insulation in the walls without two by six frames." Another builder noted that good framing prevented air leakage from the building.

Several builders also mentioned that heating and cooling contractors were critical for the energy efficiency of a home. One nonparticipant builder said these contractors ensured that heating systems were sized correctly. Table 90 shows the types of contractors thought most essential to building energy-efficient homes by participant and nonparticipant builders.

Table 90. Subcontractors Most Essential to Building Energy-Efficient Homes

Type of Subcontractor	Participant Builders	Nonparticipant Builders
Insulators	8	5
Framers	5	
Heating and Cooling	2	3
Electrical	1	

The Evaluation Team asked participant and nonparticipant builders if subcontractors required any special skills or training to build energy-efficient homes. Seven participant and four nonparticipant builders said subcontractors did not require additional training or skills beyond what was standard in the marketplace. One participant builder said, "We assume that contractors know what they are doing, and we test every home." Another noted that "they need to meet normal standards and we don't ask for anything special."

However, three participant builders and one nonparticipant builder thought contractors did require special skills to construct efficient homes. One medium-sized participant builder said insulation contractors are "required to go through training on spray foam insulation." One nonparticipant builder mentioned providing "personal education, but no special class to contractors because we go above code on insulation and a few other things."

Two other participant builders (one large-volume and one smaller-volume) also mentioned providing special training for framing subcontractors. One builder said the company conducted regular quality control meetings to ensure that "the most advanced framing techniques are taken advantage of."

Construction Practices

The Evaluation Team asked participating and nonparticipating builders about how they built homes, using the Department of Energy's Net Zero Energy Ready Homes Program prescriptive requirements for cold climates as a benchmark for a highly efficient home that is well positioned to meet the Program's highest tier: Net Zero.[50]

Building Envelope

Table 91 provides Zero Energy Ready Homes requirements for the building envelope and the percentage of homes reported by participant and nonparticipant builders who used this practice. According to interview data, many Wisconsin homes, both certified and non-certified, meet several of the prescriptive requirements, including for efficient windows and ceiling insulation.

However, though many participant builders reported installing exterior insulation greater than R-5, few nonparticipating builders said they did so to this level. Few participant and nonparticipant builders said their homes were more airtight than 2 ACH50.

[50] U.S. Department of Energy. May 1, 2019. *DOE Zero Energy Ready Home National program Requirements (Rev. 07)*. https://www.energy.gov/sites/prod/files/2019/04/f62/DOE%20ZERH%20Specs%20Rev07.pdf

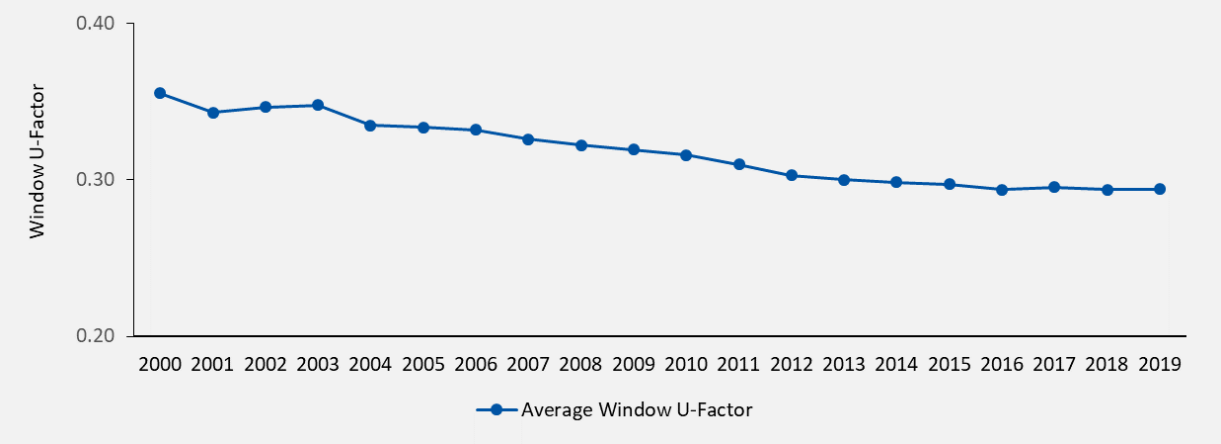
Table 91. Participant and Nonparticipant Builder Building Envelopes

Building Practice: Net Zero Energy Ready Homes Program Prescriptive Requirement	Percentage of Participant Homes Utilized [a]	Percentage of Nonparticipant Homes Utilized [b]
Building Envelope		
Windows with U-Factor of or Less than 0.27	56% (n=8)	71% (n=5)
Continuous Exterior Wall Insulation Greater than R-5	76% (n=8)	3% (n=5) [c]
ACH50: 2 or Lower	25% (n=6)	13% (n=3)
Ceiling Insulation R-49 or Greater	55% (n=8)	58% (n=5)

[a, b] Percentage weighted by total homes reported by builder.
[c] The 2017 market study found that 16% of nonparticipant homes used exterior wall insulation. Seventhwave. October 2017. *New Homes Baseline Final Report*. P. 9.

Based on the database of historical REM/Rate files, the efficiency of windows in Program homes has steadily increased since 2000, when the average window U-factor was 0.36, as shown in Figure 65. In 2019,[51] Program homes achieved an average U-factor of 0.29, very close to the Zero Energy Ready Homes standards. The 2017 market characteristics study conducted by Seventhwave, indicated that the average U-factor of non-Program homes was 0.30 (the same as the average U-factor for Program homes in 2017).[52]

Figure 65. Historical Participant Home Window U-Factors



As shown in Figure 66, the REM/Rate model database also showed steady improvement in airtightness over time, particularly since 2004. Since 2010, the average ACH50 has been below 2.00, with an average of 1.75 in 2019. This finding suggests that builders may not be aware of how tightly their homes are constructed, given that few reported achieving ACH50 below 2.00 (the average ACH 50 for homes constructed by interviewed participant builders was 1.72 in 2019). The 2017 market study indicated that the average air tightness for non-Program homes was 1.91,[53] higher than Program homes but lower than

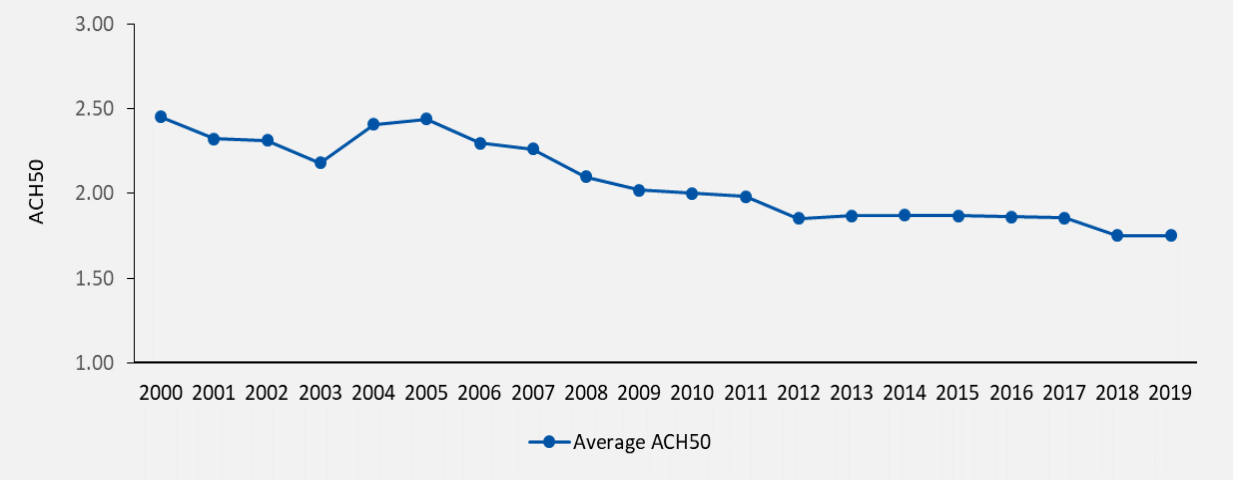
[51] Because this analysis was conducted in 2019, it does not include all Program homes built in CY 2019.

[52] Seventhwave. October 2017. *New Homes Baseline Final Report*. P. 11.

[53] Seventhwave. October 2017. *New Homes Baseline Final Report*. P. 14.

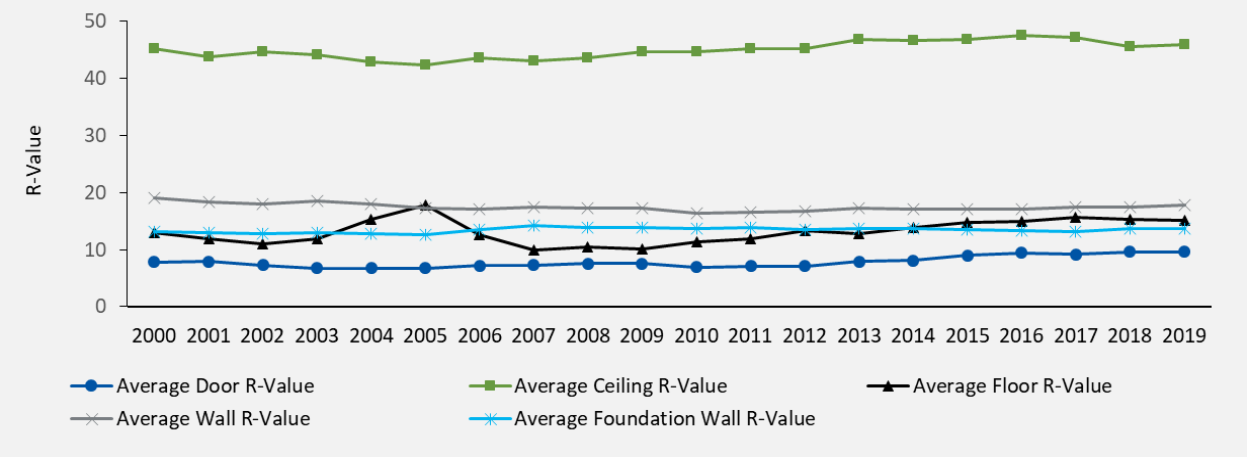
the Zero Energy Homes Ready prescriptive requirement. As with participant builder interviews, nonparticipant builders did not report that their homes had achieved that level of tightness.

Figure 66. Historical Participant Home Airtightness



The REM/Rate database also includes average insulation levels for doors, ceilings, floors, wall, and foundation walls (it does not break out continuous exterior insulation). As illustrated in Figure 67, insulation levels in Program homes have remained relatively consistent since the inception of the Program. In 2019, the average ceiling insulation R-value was 45.8. In 2017, the average ceiling insulation R-Value was 46.9 for nonparticipant homes and 47.1 for participant homes.

Figure 67. Historical Participant Home Insulation Levels



Insulation Practices

Most insulators said they used a combination of spray foam insulation and fiberglass batt, but their use varied. One insulator said his company almost always used spray foam insulation in the walls. Another said his company generally preferred to use fiberglass batt insulation. A third said his company used spray foam insulation in only 15% of the homes, but this insulator also stated spray foam was the most efficient type of insulation.

None of the four insulators mentioned installing exterior insulation on homes, a practice typically done by framers. When asked if they installed air barriers, one insulator said the company did not. The other three insulators discussed the installation of vapor barriers, which are essential for managing moisture in homes and can also increase the air tightness. They said they had not changed how they insulated homes in the last three years. However, one said he focused more on air sealing and "building a tighter home" by "getting [builders, carpenters and electricians] on the same page."

Framing Practices

The Evaluation Team asked three framers about their current building practices and any changes made to their practices in the last three years. All three used traditional 16-inch center framing techniques.

One framer described using insulated concrete forms three or four times per year to build well insulated basement walls. This framer said there was still resistance to using this technique because of the initial high cost, additional time to install, and lack of consumer awareness but that insulated concrete forms contributed significantly to the home's comfort, quality, and efficiency. Though he did not learn about this process through Focus on Energy, rather through another framing company in Iowa, he said that working on Program homes had "made them look for other practices like insulated concrete forms."

When asked about the types of air barriers or exterior insulation used, the three framers said they used plywood with Tyvek Home Wrap.[54] One sometimes also used a Zip Wall system, which provides both structure typically provided by plywood and air sealing typically provided by house wrap as well as additional insulation. None used spray foam insulation on the exterior of the home, but two framers said it was the most energy-efficient air barrier.

Only one framer had adapted framing practices in the last three years. This framer said the company had generally reduced the amount of wood used to frame homes to allow homes to be better insulated. He noted that "less wood equals more insulation" and that working on Program homes had encouraged this change. Another framer simply said: "We've done the same framing practice for 15 years, whether the home is certified by Focus on Energy or not."

Mechanical Equipment

The Evaluation Team asked participant and nonparticipant builders what types of mechanical equipment they installed in their homes, focusing on equipment required by Zero Energy Ready Homes. As shown in Table 92, builders said they were close to the Zero Energy Ready Homes prescriptive requirements in terms of furnaces, water heating equipment, and location of ductwork. However, none of the builders said they frequently installed heat or energy recovery ventilation.

[54] Though plywood provides some insulation, its insulating value is fairly minimal.

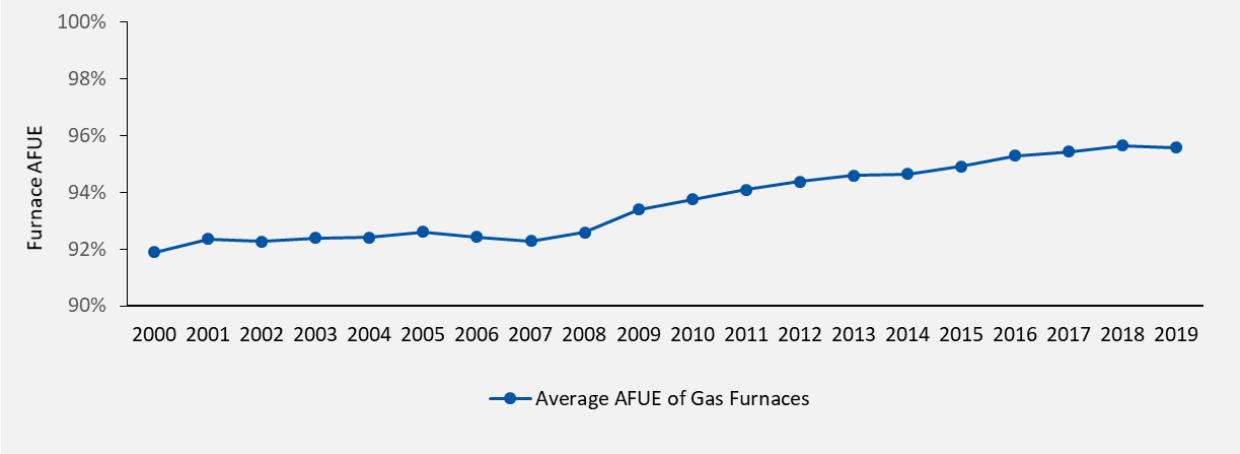
Table 92. Participant and Nonparticipant Builder Mechanical Equipment

Building Practice: Zero Energy Ready Homes Prescriptive Requirement	Percentage of Participant Homes Utilized [a]	Percentage of Nonparticipant Homes Utilized [b]
Mechanical Equipment		
Heat or energy-recovery ventilation	23% (n=9)	10% (n=5)
Gas furnace with 94% AFUE or greater with ECMs	91% (n=8)	95% (n=5)
Gas water heaters with 0.67 EF or greater (tank <= 55 gallons) Gas water heaters with 0.77 EF or greater (tank > 55 gallons) Gas instantaneous water heaters Electric heat pump water heaters	79% (n=5) 22% (n=5) 1% (n=7) 0% (n=8)	75% (n=3) 1% (n=3) 10% (n=5) 0% (n=5)
100% of ductwork and air handler located within home's thermal and air boundary (or similarly optimized location)	88% (n=8)	98% (n=3)

[a, b] Percentage weighted by total homes reported by builder

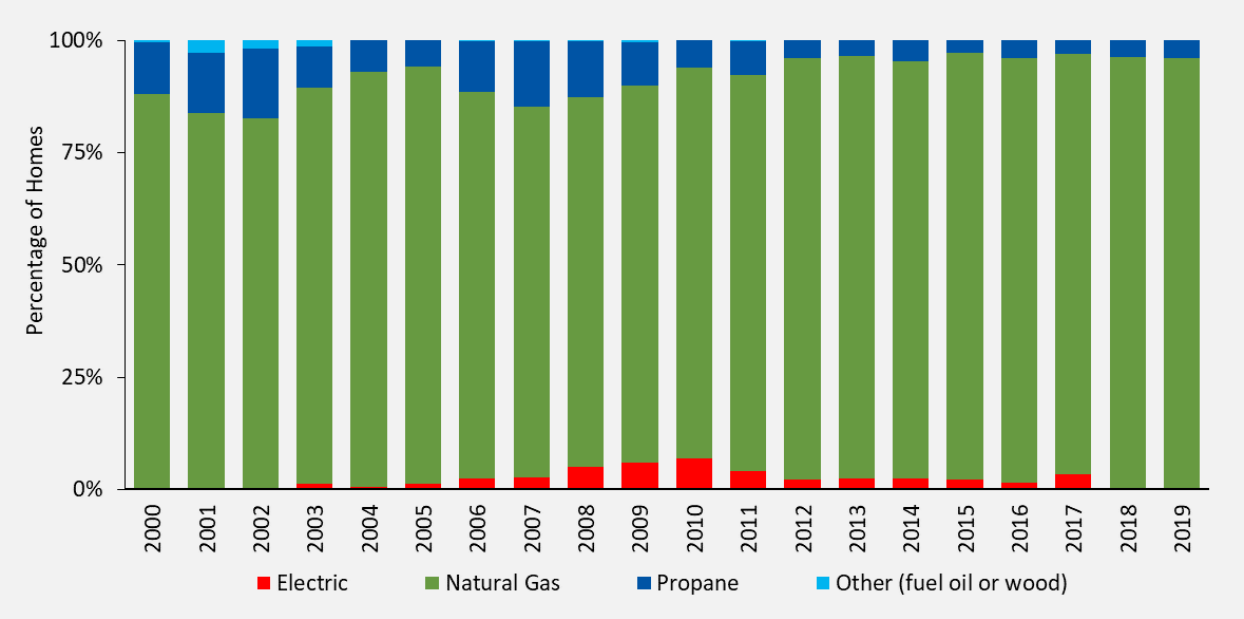
The REM/Rate database does not provide information on if a heat or energy-recover ventilation system is installed; however, it does have data on the efficiency of furnaces, water heaters, and the location of ductwork. According to the REM/Rate models, the efficiency of gas furnaces has steadily increased since Program inception. Average furnace efficiency was 92% AFUE in 2000 and 96% in 2019. The 2017 market study found that the average efficiency of furnaces in non-Program homes was 95%. This trend is illustrated in Figure 68.

Figure 68. Historical Participant Home Furnace Efficiency



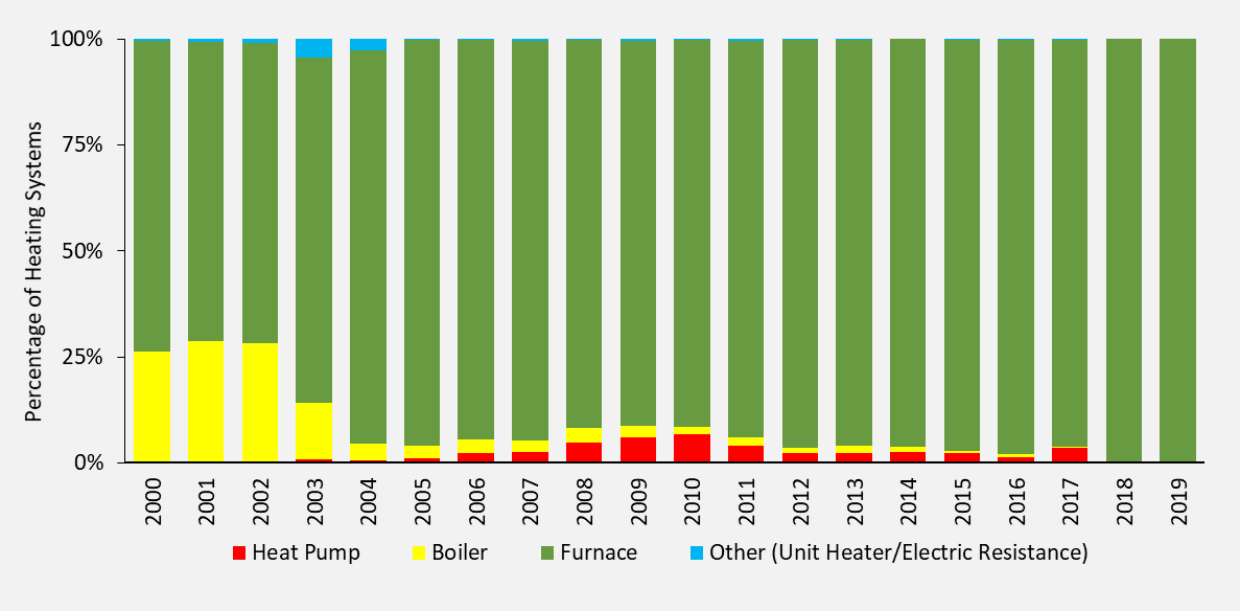
The historical model files indicate that the heating fuel for program homes has primarily been natural gas, though some program homes were also heated by propane and electricity (Figure 69).

Figure 69. Historical Participant Home Heating Fuel



As illustrated in Figure 70, the REM/Rate database also showed that gas furnaces have been the primary heating system for Program homes since inception, especially since 2003, when the use of boilers significantly decreased. Though heat pumps have been used, their use in Program homes has peaked in 2010.

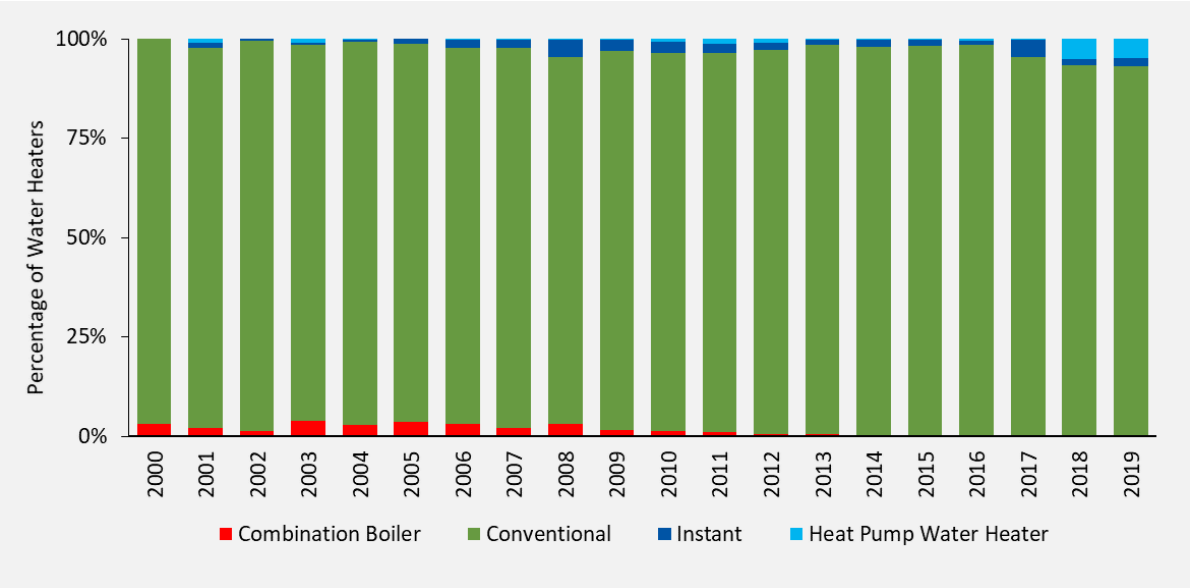
Figure 70. Historical Participant Home Primary Heating System



Historical records show that conventional tank water heaters have been the primary water heating system for many years, though boilers, instant, and heat pump water heaters have also been used (Figure 71). The historical REM/Rate model database also shows a steady increase in the efficiency of

conventional water heaters. In 2019, the average conventional water heater energy factor was 0.7, whereas the average efficiency of these systems was 0.59 in 2000. In 2017, the market study found the energy factor was 0.68 for water heaters in non-Program homes (note that the market study included two tankless water heaters in this estimate).[55]

Figure 71. Historical Participant Home Water Heating System

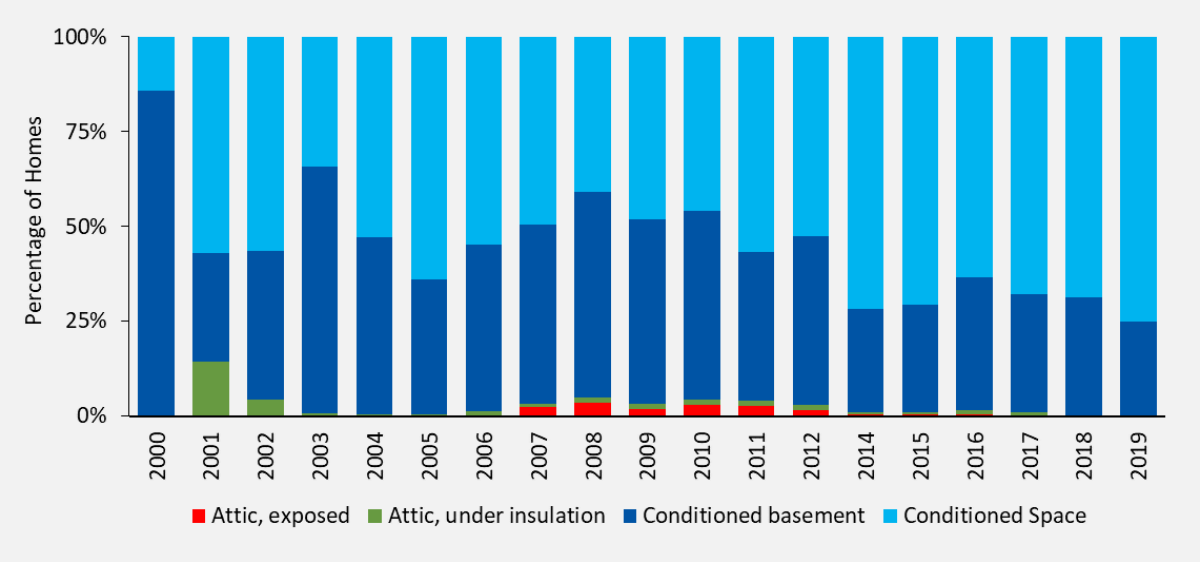


The REM/Rate database also included information about where ductwork is primarily located. As illustrated in Figure 72, ductwork has been located primarily in conditioned spaces throughout the life of the Program. The 2017 market study found that seven of 50 homes had ductwork outside of conditioned spaces, and one of these homes had significant ductwork outside of conditioned space.[56]

[55] Seventhwave. October 2017. *New Homes Baseline Final Report*. P. 19.

[56] Seventhwave. October 2017. *New Homes Baseline Final Report*. P. 16.

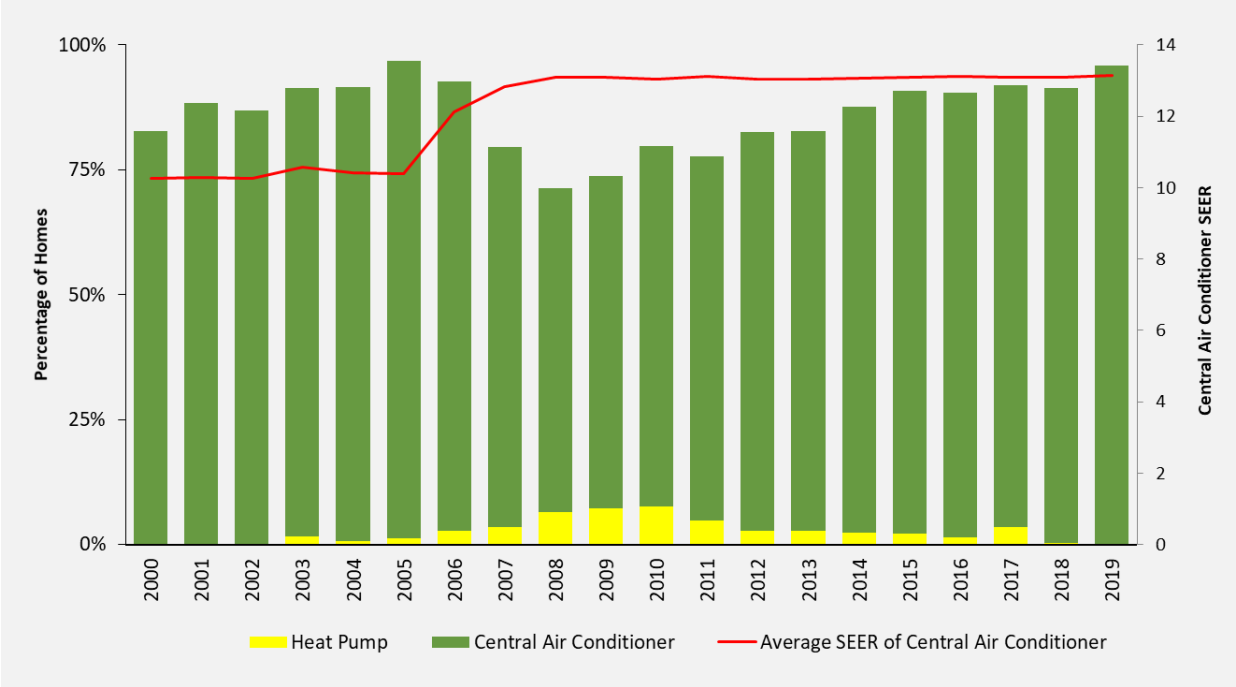
Figure 72. Historical Participant Home Primary Location of Duct System



The REM/Rate database also provides data on the type of cooling equipment that participant builders have historically installed in Program homes. As shown in Figure 73, in CY 2019, 96% of Program homes had a central air conditioner. Efficiency has trended to 13.1 seasonal energy efficiency rating (SEER) since the introduction of federal equipment standards that raised central air conditioners to 13 SEER in 2006. The 2017 market study states that the average central air conditioners in nonparticipant homes was 13.3 SEER.[57] The minimum requirement of the Zero Energy Ready Home in Wisconsin's climate zones is 13 SEER.

[57] Seventhwave. October 2017. *New Homes Baseline Final Report*.

Figure 73. Historical Participant Home Cooling System and Central Air Conditioner SEER



The Evaluation Team asked the three HVAC contractors about their current installation practices and any changes made to practices in the last three years. They said ductwork was usually exclusively within the home's conditioned space in both Program and non-Program homes. In the rare instances when ductwork is in unconditioned spaces, two HVAC contractors used spray foam and one used pre-insulated ducts for insulation.

HVAC contractors said they had installed heat or energy recovery ventilation in Program and non-Program homes. One installed the system in all Program homes but only 15% of non-Program homes. The other two contractors installed only a few systems in Program and non-Program homes. Regarding highly efficient furnaces (94% AFUE or greater), two contractors said all Program-certified homes had these systems, and one said most Program homes had them. All contractors noted, however, that relatively fewer non-Program homes had highly efficient furnaces.

None of the HVAC contractors reported making significant changes to practices over the last three years, though one said he was seeing greater demand for heat recovery ventilation systems and smart thermostats.

Lighting and Appliances

The Evaluation Team asked participant and nonparticipant builders about the percentage of LEDs and efficient appliances they installed in their homes. As shown in Table 93, most builders, both participant and nonparticipant, reported that at least 80% of bulbs installed were LEDs and that they installed ENERGY STAR appliances in most of their homes. Builders noted they do not always provide appliances in their new homes.

Table 93. Participant and Nonparticipant Builder Installation of LEDs and ENERGY STAR Appliances

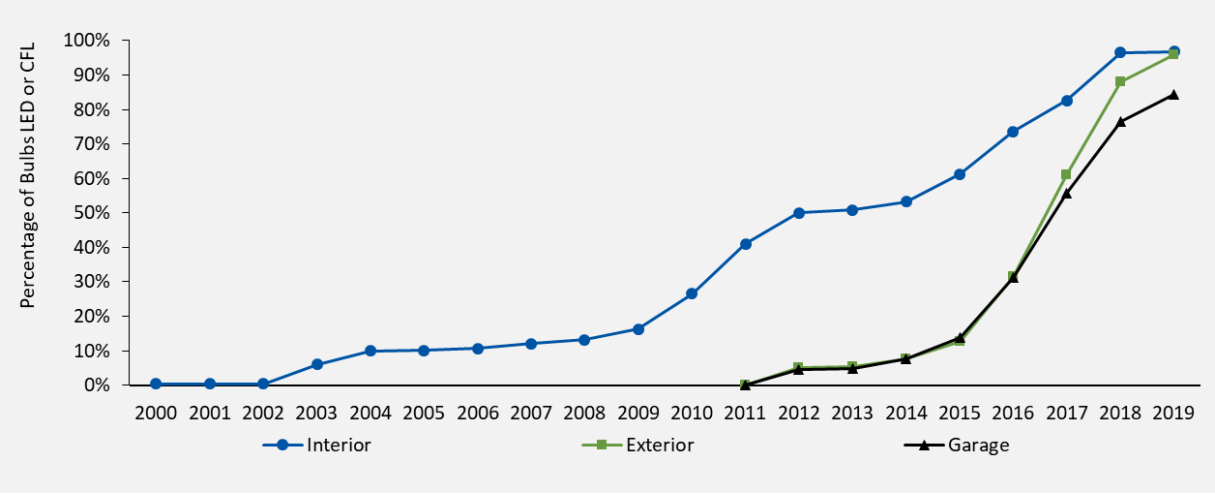
Building Practice: Zero Energy Ready Homes Prescriptive Requirement	Percentage of Participant Homes Utilized [a]	Percentage of Nonparticipant Homes Utilized [b]
Lighting and Appliances		
80% or more percent of light bulbs or fixtures are LEDs	90% (n=8)	97% (n=5)
All installed appliances are ENERGY STAR-qualified	87% (n=6) [c]	92% (n=4)

[a, b] Percentage weighted by total homes reported by builder

[c] Two builders said that they do not install appliances in homes.

The historical REM/Rate database provides information about the percentage of LED or CFL lightbulbs. Older versions of REM/Rate did not provide an option for BPCs to enter information about LEDs, so the Evaluation Team assumed BPCs entered information about LEDs in the CFL field. Since it is impossible to distinguish between CFLs and LEDs for earlier versions of REM/Rate, the Team reported CFLs and LEDs together. However, in recent years, lightbulbs installed in Program homes have primarily been LEDs. As shown in Figure 74, the percentage of efficient lightbulbs has increased dramatically, since Program inception, especially since 2014.

Figure 74. Historical Participant Home Percentage of Efficient Lightbulbs Installed



In 2019 Program homes, LED lightbulbs were installed in 88% of interior sockets, 92% of exterior sockets, and 50% of garage sockets. According to the 2017 market study, 56% of home sockets had LED bulbs, 8% had CFLs, 2% had linear fluorescents, and 33% had incandescent bulbs; it did not distinguish between socket locations.[58]

Other Practices

The Evaluation Team also asked builders about a variety of other building practices, such as installing smart thermostats (the Zero Energy Ready Home prescriptive standard requires programmable thermostats), electric vehicle-ready wiring, and on-site renewable energy. As shown in Table 94, 42% of

[58] Seventhwave. October 2017. *New Homes Baseline Final Report*.

participating builders and 53% of nonparticipating builders reported installing smart thermostats. One HVAC contractor said his firm installed smart thermostats in 100% of certified homes and approximately 50% of non-certified homes. Data from the REM/Rate files database indicate that, since 2013, over 99% of the thermostats installed in Program-certified homes were at least programmable thermostats. (REM/Rate currently does not distinguish between smart and programmable thermostats).[59]

Table 94. Other Participant and Nonparticipant Builder Practices

Other Building Practices	Percent of Participant Homes Utilized [a]	Percent of Nonparticipant Homes Utilized [b]
Smart Thermostats	42% (n=8)	53% (n=5)
Electric Vehicle-Ready (a pre-wired 240v outlet)	6% (n=8)	3% (n=5)
On-Site Renewable Energy	0% (n=6)	2% (n=5)
Renewable-Ready Home Features (such as pre-designated areas for solar PV installations or inverters)	3% (n=8)	2% (n=5)

[a, b] Percentage weighted by total homes reported by builder

Very few builders reported providing electric vehicle-ready wiring, on-site renewable energy, or renewable energy-ready features. One participant builder who does not provide electric vehicle-ready wiring said he had asked an electrician about making this feature standard; the electrician told him that "no one has done that." Nevertheless, the builder has considered providing the feature "down the road." Another participant builder said "not many people request" electrical vehicle features and that it is "expensive and I don't think it will be standard in every home in the foreseeable future."

For renewable-ready features, one builder said the "return on investment" was not there, "people are not thinking long term," there is "no demonstrated value" for the features, and the builder did not "want to pass on costs that aren't important to customers."

Effect of Program on Participant Builder Practices

The Evaluation Team asked participant builders why they were part of the Program. Four said the Program helped them build homes of better quality, which, according to one builder, decreases call-backs. One builder said, "It's not about energy savings, it's about building a better-quality home. We would make mistakes prior to Focus on Energy and don't make those anymore because of the Program. I know our homes will perform better, and that helps me sleep better at night." Five builders said the BPC model helped them improve their homes.

The Team asked participant builders if the Program had affected how they built homes in Wisconsin. Nine builders said the Program had had an effect. Six builders had made general improvements in their practices, often through the advice provided by the BPCs. As one participant builder noted, "The

[59] According to the study, 78% of thermostats in non-Program homes were programmable, 16% were smart, and 6% were standard thermostats. Seventhwave. October 2017. *New Homes Baseline Final Report*." P. 22

requirements to have a third-party rater to inspect the home and tell us what we are doing right and wrong and what we can improve on sets the standard for what we have to meet."

Several builders pointed to specific practices, including the following:

- Improved air sealing (3 builders); one builder mentioned that "Air sealing is the number one thing and we spend a lot of time on that"
- Use of spray-foam insulation (3 builders); one builder noted insulating rim joists with spray foam
- Correctly sizing HVAC equipment (2 builder)
- Managing air-circulation (1 builder)
- Using exterior continuous insulation (1 builder); one builder said the Program had "driven us especially into using exterior insulation"
- Improved framing (1 builder)
- Increased use of LEDs (1 builder)

When asked how the Program had caused them to change practices, seven participating builders offered feedback. Four said the Program's influence, through information sharing and education generally, had helped them adapt their construction practices. One builder said, "We know that the building is airtight, insulated, and framed the right way. That part of the Program brings the most value to us." He also said, "The Program has affected our understanding of how to build the best home."

Three builders said that advice from the BPCs was the driver for changing practices. One said that "having consultants come out and give us feedback is really helpful" and another said that "the third-party rater tells us what we are doing right and wrong and what to improve on."

The Evaluation Team asked nonparticipant builders if they had changed their construction practices in the last three years and what, if anything, had caused them to change something about their practices. Three builders said they had generally improved but could not point to specifics beyond "looking for the best materials or equipment, "always improving things," or "conducting research on materials to see which are most beneficial for my clients." However, one nonparticipant builder had improved insulation practices, and one had increased the company's offering of renewable energy. A nonparticipant builder said the company had moved toward using smart thermostats instead of programmable thermostats, and the change was made due to customer demand.

When asked why they had made changes to their building practices, four nonparticipant builders said they were reacting to customer demand, such as for LED lighting. One builder said higher construction costs had increased the competitiveness of the market.

Focus on Energy Training

The New Homes Program provides participating and nonparticipating builders, contractors, and other market participants (such as code officials and material suppliers) with training about building science topics. This training is intended to give market actors information about how to build better and more

energy-efficient homes. In CY 2019, 545 attendees participated in 16 training sessions (including special training for builders on sales tactics and training designed to recruit new BPCs into the Program).

Builder and Contractor Participation in Focus on Energy Training

Of 10 participant builders interviewed, four recalled that they, or someone at their organization, had participated in a Focus on Energy builder training or seminar (one thought this was an annual meeting and three said they were seminars, of which they had attended several). None of the five nonparticipant builders said they had participated in Focus on Energy training. Four of 10 contractors recalled participating in a Focus on Energy training, though two said they had participated a long time ago. These results are shown in Table 95.

Table 95. Focus on Energy Training Participation

Builder/Contractor	Training Participation	Material Learned	Training Affected Practices	Effect on Practice
Participant Builder	4 of 10	General best practice, "make-up air," exterior weather barriers	3/10	Improvement to air tightness, overall "higher quality home"
Contractor	4 of 10	General framing best practices, attic insulation, use of vapor barriers	1/10	Closer collaboration between framer and insulator
Nonparticipant Builder	0 of 5			

When asked what helpful material they had learned, two participating builders pointed to general best practices, such as a "series of small points and tips that we take back and use in the field." One builder said training on how to compensate for venting air from homes with "make-up air" was most helpful, especially as code officials also attended the meeting. Another learned more about how to apply weather barriers on a home's exterior. Three said the training affected how they built homes, including improving exterior air barriers and adding greater focus on air-tightness in general. One builder said only that training helped the builder construct a "higher quality" home overall.

The Evaluation Team followed up with the contractors—three insulation contractors and one framer—who recalled participating in training and asked if the training had influenced how they insulated or framed homes. One insulator said the Program "just doesn't affect us that much" because there was little difference in the way the company insulated Program and non-Program homes. Another insulator was not sure if training had had any effect. However, one insulator who had participated in training had learned "how to properly do attic insulation" and when it was not necessary to use vapor barriers depending on the thickness of foam insulation. The framer noted that training had "changed my framing practices and thoughts on framing in general," particularly regarding the need to work closely with the insulator to construct well-built homes.

Two of the 10 contractors said they had participated in training offered by organizations other than Focus on Energy. This training was offered by materials manufactures, such as window and door

manufactures, and other institutions, including High Performance Insulation Professionals and the Insulation Contractors Association of America.

Marketing and Outreach

Focus on Energy has typically marketed the New Homes Program primarily through the BPCs and home builders. In CY 2019, as in prior years, Focus on Energy conducted additional Program marketing geared toward homebuyers, using tactics that included highlighting Program homes in the Wisconsin Parade of Homes as well as social media advertisements. Homebuyer-facing messages emphasize the safety, comfort, and durability of the home and are not designed to Focus on Energy efficiency.

In CY 2017, Focus on Energy conducted research with homebuyers. The study found that Focus on Energy certification "had little impact" on homebuyers' selections. In fact, many homebuyers did not know they had purchased a Focus on Energy-certified home. Homebuyers also said the most important attribute regarding their certified home was the Program's ventilation requirement, "to prevent mold or increase indoor air quality," and the home inspections.[60]

Builder Marketing Practices

The Evaluation Team asked participating and nonparticipating builders how they market their homes, including the use of marketing media and the marketing messages.

Participant Builder Marketing Practices

Five builders said they participated in the Program because it helps them sell homes, particularly by showing customer value. All 10 participating builders said they marketed their homes as energy-efficient, though the degree to which they highlighted energy benefits varied. One builder said the company "mentions energy efficiency, but that is not the focus." Six builders said they marketed their homes as Focus on Energy homes and that this implied that the homes were energy-efficient and provided "a guarantee to the customer." Another said his company liked to use Focus on Energy marketing materials that show "how much more energy-efficient our homes are than average homes." Three said they highlighted the energy efficiency of their homes in sales presentations or walk-throughs, and one mentioned highlighted energy efficiency on the company's webpage.

Participant builders also said they highlighted the non-energy benefits of their homes. One builder's company emphasized the various inspections the homes had to pass to be Program-certified. Another focused more on the home being "third-party tested, and less on being energy-efficient" when noting Focus on Energy affiliation. Two builders focused on the increased quality of their homes, two focused on the comfort of their homes, and another builder said his company highlighted the health benefits of their homes.

Other than in-person presentations and meetings, participant builders said general marketing approaches included showing model homes, such as during the Parade of Homes event (three builders), and taking advantage of social media (two builders). Other, less frequently mentioned approaches

[60] Focus on Energy. 2017. *Focus on Energy New Home Owner Interviews*.

included highlighting awards received for the homes, developing printed materials, being a member of a builder's association, and relying on word-of-mouth.

Nonparticipant Builder Marketing Practices

One nonparticipant builder mentioned energy efficiency when selling homes but said the company "does not lead" with this message. The other four nonparticipant builders said they did not market their homes as energy-efficient. Nonparticipant builders use a broad range of marketing approaches, including builder website (four builders), word-of-mouth (three builder), showing model homes and attending home shows (three builders), providing brochures (two builder), using social media (two builders), receiving awards for their homes (one builder), and being members of home builder associations.

Homebuyer Interest in Energy Efficiency

The Evaluation Team asked participant and nonparticipant builders how frequently they received inquiries from customers or potential customers about the energy efficiency of their homes. Only two participant and one nonparticipant builder said customers inquired relatively often. Two said they ensured customers learned about energy efficiency of homes, even if they did not ask about it. One said, "It's mostly us telling them [about energy efficiency]. From my experience, it's more the bells and whistles that people care about. It's up to us to emphasize the importance of energy-efficient features."

Other builders said customers asked infrequently. One participant builder said, "People are looking for value, if you can achieve the quality and pricing, that is going to bring the customers. People aren't running to say it's so important that the home is energy-efficient, but it is important if they aren't comfortable after move-in. We want to make sure those things are a given, like no drafts and correctly sized A/C."

Wisconsin New Construction Market

Cadmus asked participant and nonparticipant builders about changes they had seen in the new construction market in the last three years, reasons for those changes, and how competition has affected the way that they built homes.

Low Supply of Labor

The most frequently mentioned change in the Wisconsin new construction market was a labor shortage, which two participant and two nonparticipant builders attributed to the aging population of contractors. Two participant and one nonparticipant builder said the labor shortage was compounded because no new contractors were being trained partly because there was "no training and excitement in schools […] about the trades." Another builder said technology had created a situation "where people don't want to work with their hands and trade schools don't get advertised in high schools."

Six participant and four nonparticipant builders said they were experiencing challenges finding subcontractors to build homes. One participant builder said, "There is demand for skilled trades, it is definitely hard to find good [contractors]." A nonparticipant builder said, "There is low labor [supply],

especially with framers, we have had to use more different framers now. We now have nine framers we work with compared to two or three a few years ago."

Contractors made the same observation about a labor shortage in the new construction market. Three HVAC contractors, two insulators, and one framer said the labor shortage in Wisconsin worked to their benefit. One framer said, "[We have] a large quantity or work," an insulator said, "We are on the easy end of it," and an HVAC contractor said, "People are coming to us."

Increased Cost of Homes

Six participant builders said the average cost of homes had significantly increased over the last three years. Two of these builders said the price increase resulted from the labor shortage, while one participant and one nonparticipant builder attributed higher home construction cost to tariffs. Another participant builder said lumber prices were "astronomical compared to 10 years ago."

One builder said, "Many builders are stuck in the $500,000 to $600,000 market, but [most customers] can afford a $250,000-$300,000 home, and it is hard to build those homes." Six contractors also noted that demand for new homes had increased significantly over the last three years. A framer said the cost of new homes had been going up because "general contractors are taking a bigger cut than before" and "land is expensive as well."

The Program Implementer made the same observations, saying that the biggest challenges to building energy-efficient homes in CY 2019 was continued market pressure on the cost of homes because of the labor shortages and tariffs. (Note that most lumber for the Wisconsin market is imported from Canada.)

Changing Customer Demands

Two participant and two nonparticipant builders had observed changes in customer demand over the last three years. One participant builder said homebuyers generally conducted more online research about homes, which made them more demanding generally, and one nonparticipant builder said homebuyers generally demanded higher quality homes. An insulator who made the same observation said homebuyers "read a lot and care a lot" about how their home is built.

In response to homeowners' demands, one HVAC contractor almost always installed smart thermostats, and one framer built homes that allowed for more insulation. One nonparticipant builder said customers frequently "upgrade windows for energy reasons." An HVAC contractor generally saw "trends toward more energy-efficient measures," including energy recovery ventilation and smart thermostats. However, another nonparticipant builder said efficiency "is not as big of a deal as it was five years ago" because "energy costs are down so much right now." Two framers and an HVAC contractor also observed that homebuyers demanded that homes be more energy-efficient; one of the framers said, "There is higher concern for ecological impacts and demand for better insulated homes" and that buyers had the funds to upgrade to more efficient homes.

One participant and two nonparticipant builders said changing customer demands and priorities impacted their building practices. One builder said, "Customer demand definitely [has an effect], and

that's why we have gone to less expensive homes." Another builder said, "We always try to appease the customer and do what they want in their dream home."

Program Market Effects

The Evaluation Team asked the 10 participating builders if they thought the New Homes Program had influenced the way nonparticipating builders constructed homes in Wisconsin. Eight builders thought the Program had had an effect, one builder did not, and one builder did not know.

The Team asked the five nonparticipant builders the same question. One builder said, "I'm sure [the Program] has [had an effect on how we build homes]. As programs are implemented and education is out there for contractors it probably does affect the way we build, but not sure how much." Three builders were not sure.

Four of the nonparticipant builders said their subcontractors worked on both Focus on Energy-certified and non-certified homes. One of these builders said this may have had an effect on how the builder constructs homes: "Maybe some of the contractors' suggestions could have come from the Program." However, another builder said contractors did not "push" any particular practices or "say we have to do this or that."

Increased Competition

Though participant builders did not specify any changes in nonparticipant builders' construction practices as a result of the Program, five noted that they—participant builders—were at a competitive advantage because home sales probably emphasized Program certification. Competition would therefore pressure nonparticipant builders to construct homes in line with Focus on Energy standards.

One participant builder said, "The Program puts pressure on nonparticipant builders. We sell certified homes, but they do not, and they can't sell against it. They are just getting further behind by not participating. Focus on Energy is a buzzword, and probably casts doubts in consumers' minds when builders don't have it." Another said that a homebuyer "has awareness of how our homes differ." One builder specifically noted the competitive advantage of Program-required home inspections: "We have data from energy inspections and blower door test to draw in customers and show that we have a track record of success. I like to think that other builders don't have that."

When asked about the effect of greater competition on how builders constructed their homes, one participant and one nonparticipant builder said it pushed them to mimic successful practices of other builders. However, six participant and three nonparticipant builders said competition from other builders had no effect on how they constructed homes. One custom builder said competition had a limited effect because the company built homes exactly to customer requirements and suggested that competition probably had a greater effect on builders who built spec homes.

Two builders noted the advantage to participating contractors because they used more advanced building techniques and had access to other high-performing contractors. One participating builder said, "High-performing contractors all work with Focus on Energy, so if you are not participating, the builder is probably missing out." Another said that "[We are] cutting edge and they are not."

Increased Awareness about Higher Performing Homes

Three participating builders said the Program had raised awareness about home performance across the market with both builders and homebuyers. One said the New Homes Program "helps builders become more aware of the overall performance of a home, compared to just one aspect, such as wall insulation."

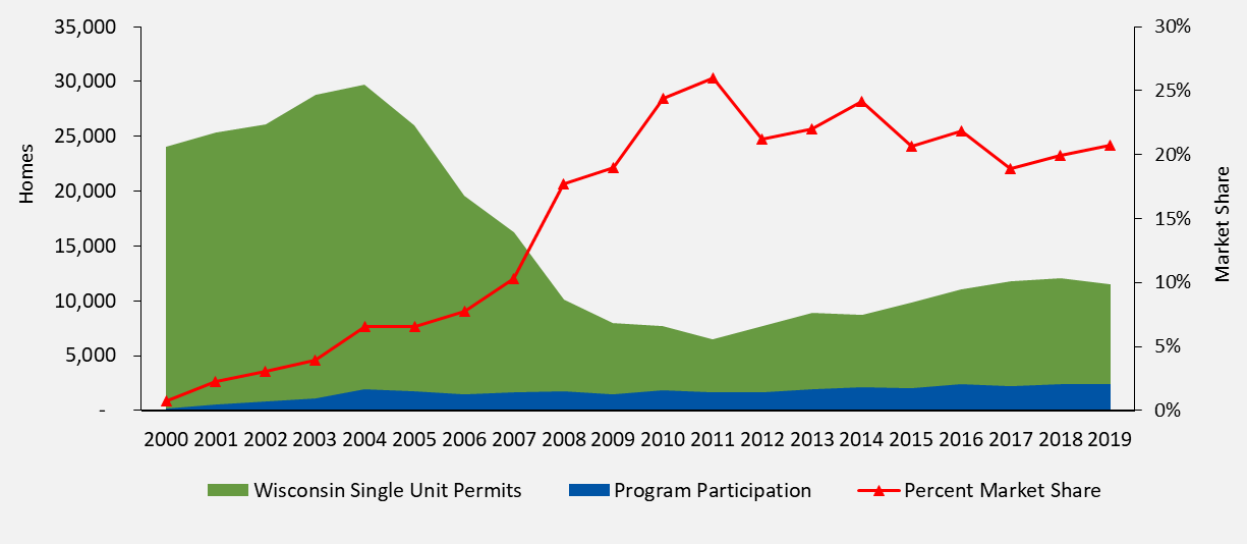
Two nonparticipant builders thought the Program had raised consumer awareness about building standards and energy efficiency practices by setting a higher standard for nonparticipating builders to meet. One said, "Even clients that don't demand energy efficiency are aware that there are programs out there and take that into consideration." Another said the New Homes Program required builders to be "more reputable and more in tune with today's awareness of how homes should be built."

However, two nonparticipant builders said the increased cost of highly efficient homes was not attractive to potential buyers. One said, "When you get into energy efficiency, people are interested and like the idea of it, but it's an additional cost; most people aren't in their homes for a long period of time, so I think [the Program] has made people more curious, but maybe [they] don't want to spend money on it."

Program Market Share

The Evaluation Team estimated the Program market share by comparing participation data from 2000 through 2019 with new construction permit data from the Census Bureau's American Community Survey. As shown in Figure 75, the market share of Program homes has fluctuated between 20% and 25% since 2010, and the overall number of Program homes has been relatively consistent compared to wider fluctuations in the Wisconsin market.

Figure 75. Historical Market Share of Program Homes



Market Effects Theory of Change

The Evaluation Team asked the Program Implementer about the impact of the Focus on Energy New Homes Program on the wider new homes market in Wisconsin. According to the Program Implementer, the Program's primary impact is through contractors who work on both participating and nonparticipating homes. This theory was supported in interviews with builders and contractors who noted additional effects on the overall market:

- Contractors who worked on Program and non-Program homes applied skills learned through engagement with BPCs and builders and Program-sponsored training.
- Increased consumer demand for efficient homes due to pressure from participant builder and Program marketing influenced nonparticipant builders to improve construction practices.
- Participant builder constructed their non-certified homes to Program standards because they had adopted Program standards as standard practice.
- Participant builders who drop out of the Program continue to apply the high standard of construction practices.

However, builders and contractors varied in the degree to which they thought these mechanisms had an effect on the efficiency of non-Program homes. They most strongly supported contractor engagement but thought this relationship was subtle. They thought the other mechanisms were even more subtle. The Evaluation Team did not speak to former Program participants and, therefore, could not gauge the likelihood that they would continue to apply Program construction practices.

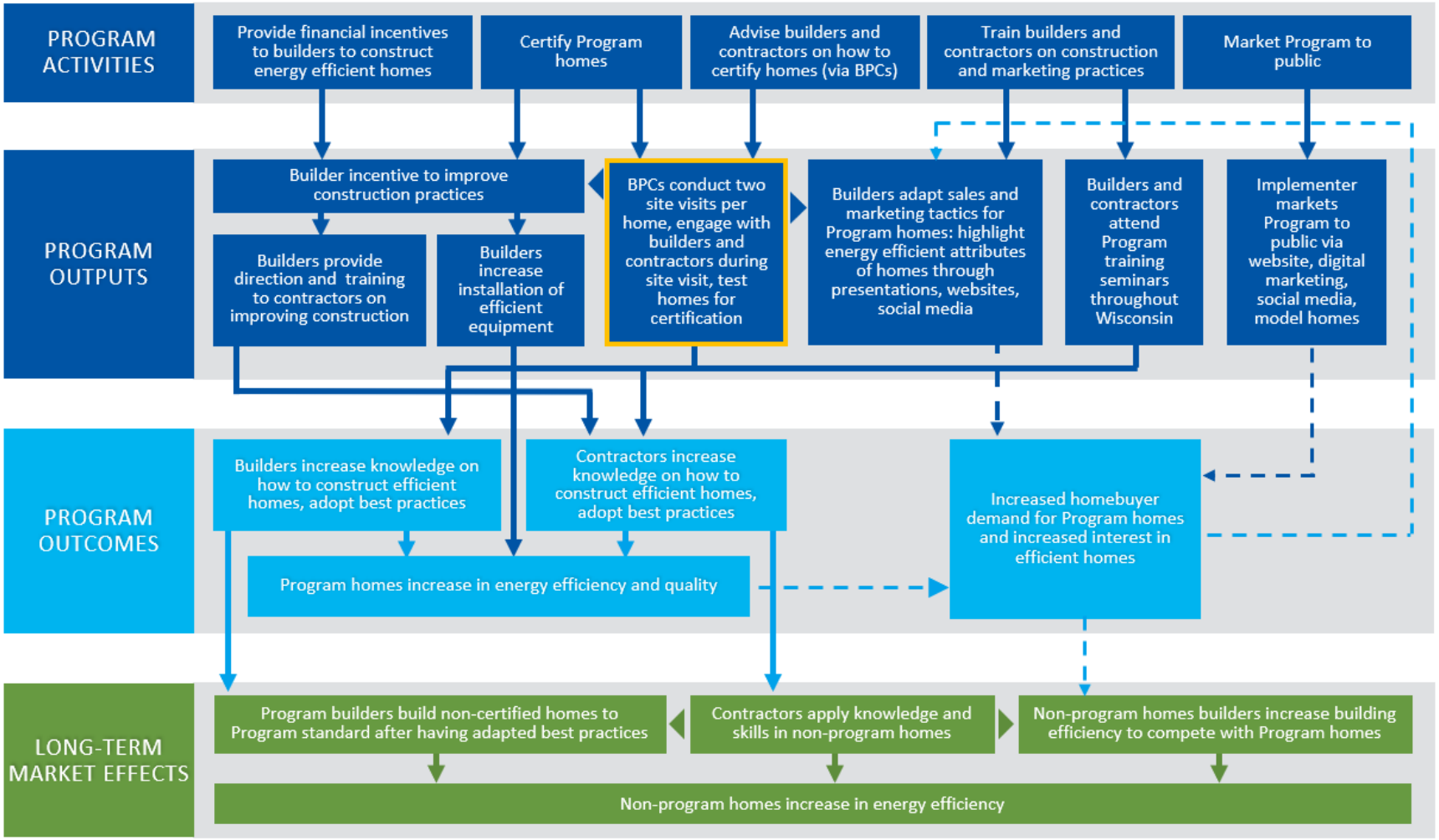
Figure 76 is a logic model that illustrates the dynamics of the Program theory of change, including the perceived strength of the mechanisms.

Builder Recommendations for Program Improvement

The Evaluation Team asked the 10 participant builders if they had suggestions to improve the New Homes Program. Eight builders offered the following suggestions:

- Increase consumer awareness regarding the benefits of energy-efficient homes and attending to air quality issues related to tightly constructed homes (3 builders)
- Lobby to increase the stringency of statewide building codes (2 builders)
- Increase the predictability of incentives (2 builders)
- Increase incentives (2 builders)
- Stop increasing certification requirements, which makes it harder to participate (2 builders)
- Provide HERS scores as a performance metric (1 builder)

Figure 76. Market Effects Logic Model



Program Cost-Effectiveness

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

Table 96 lists the CY 2019 incentive costs for the New Homes Program.

Table 96. New Homes Program Incentive Costs

	CY 2019
Incentive Costs	$1,386,950

The Evaluation Team found that the CY 2019 New Homes Program was not cost-effective (0.20). Table 97 lists the evaluated costs and benefits.

Table 97. New Homes Program Costs and Benefits

Cost and Benefit Category	CY 2019
Costs	
Administration Costs	$468,188
Delivery Costs	$535,495
Incremental Measure Costs	$1,113,765
Total Non-Incentive Costs	**$2,117,447**
Benefits	
Electric Benefits (kWh)	$0
Electric Benefits (kW)	$0
Gas Benefits	$358,326
Emissions Benefits	$61,429
Total TRC Benefits	**$419,754**
Net TRC Benefits	**($1,697,693)**
TRC B/C Ratio	**0.20**

Evaluation Outcomes and Recommendations

The Evaluation Team identified the following outcomes and recommendations for the New Homes Program.

Outcome 1. Further research is necessary to assess the Program's impact on the Wisconsin residential new construction market. The low NTG result from the CY 2019 billing analysis suggests very high freeridership and by itself indicates the Program is not driving participating builders to construct Program homes that are more energy-efficient than non-Program homes. However, builder and contractor interviews suggest the Program's longevity and use of BPCs could be influencing residential construction practices beyond Program homes. If that is true, what appears to be high freeridership in the billing analysis results may in fact be Program-induced nonparticipant spillover or market effects.

Based on Program and market data collected thus far and the maturity of the Program, it is likely the Program has a broad impact on the Wisconsin residential new construction market. However, the Evaluation Team cannot conclusively determine how that impact translates into energy savings using data that are currently available. Further research is required to determine what factors are driving residential construction practices and how these factors affect the Program's overall net impacts.

Recommendation 1. Program staff and the Evaluation Team should continue efforts to capture the Program's impact on the Wisconsin residential new construction market and investigate additional factors that may be influencing the NTG results.

Recommendation 2. Focus on Energy should not implement large changes to the Program until it better understands how the Program is impacting the Wisconsin residential new construction market.

Outcome 2. Equipment-specific incentives could help distinguish Program homes. The Team's analysis of Program home REM/Rate files, interviews with participating and nonparticipating builders, and the 2017 market characterization study revealed that both Program and non-Program homes are generally well built and meet or are close to meeting many of the prescriptive requirements needed to qualify for the Department of Energy's Net Zero Energy Ready program. Program homes have also shown steady energy efficiency improvements for many years, particularly in terms of air-tightness, window efficiency, and furnace efficiency, while maintaining relative consistent insulation levels. However, builder interviews and the Team's review of REM/Rate models revealed that the use of instantaneous water heaters, heat pump water heaters, smart thermostats, and heat-recovery ventilators is not widespread.

Recommendation 3. Consider offering bonus incentives for builders who install additional energy-efficient equipment, such instantaneous or heat pump water heaters, smart thermostats, or heat-recovery ventilators.

Outcome 3. Building Performance Consultants may be a key influence in the Wisconsin residential new construction market. Interviews with participating builders, nonparticipating builders, and contractors indicate that the Program affects the energy efficiency of non-Program homes. Notably, interviewees suggested the use of BPCs is especially effective; these consultants provide information and advice not only to participating builders but also to contractors who can bring new skills and practices to the construction of non-Program homes.

Online Marketplace Program

Focus on Energy launched the Online Marketplace Program in September 2019. The Program uses an online shopping platform (Focus on Energy Marketplace, or Marketplace) to provide a new delivery channel for the purchase of energy efficiency products. The Marketplace is available to all residential customers of Focus on Energy participating utilities. It is targeted to residential customers who prefer to shop online or have limited access to other Focus on Energy discounts offered at physical retail locations.

For the CY 2019 year, the Program Administrator was APTIM and the Program Implementer was Uplight. The Program Administrator made the transition to a new Implementer at the end of CY 2019.

In CY 2019, residential customers could access the Marketplace to purchase the following eligible products, with the rebate instantly subtracted from the purchase price:

- Smart thermostats ($50 rebate)
- Advanced power strips ($20 rebate)
- LEDs, low-flow showerheads, and faucet aerators (33% discount)

Table 98 lists actual Program spending, savings, participation, and cost-effectiveness in CY 2019. These values represent only the smart thermostats and advanced power strips that were tracked in SPECTRUM in CY 2019. LED and water-saving measures sold through the Marketplace in CY 2019 were not uploaded to SPECTRUM in CY 2019 and will be reported in CY 2020.

Table 98. Online Marketplace Program Summary

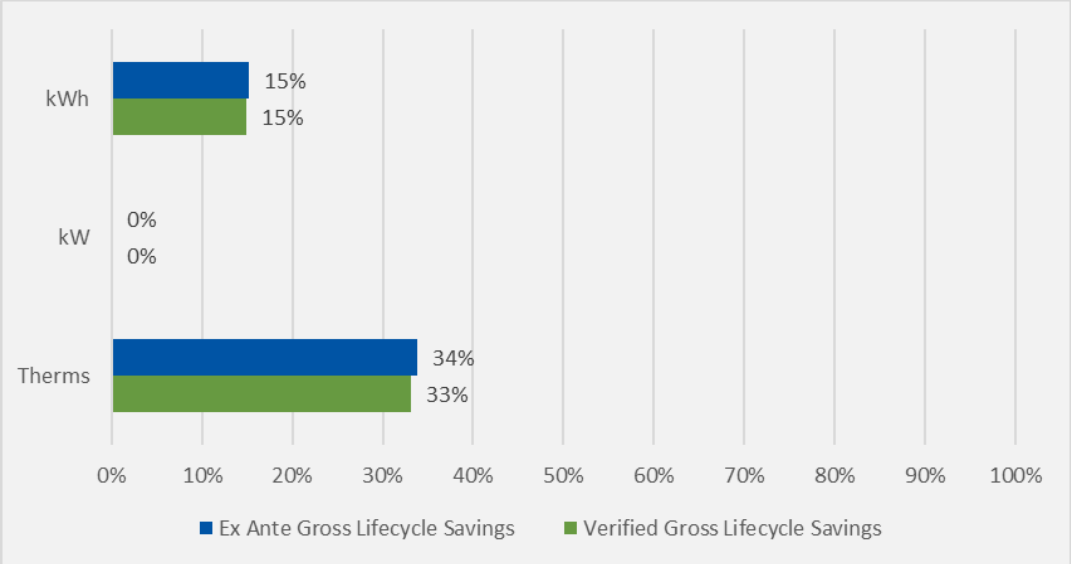
Item	Units	CY 2018[a]	CY 2019
Incentive Spending	$	$0	$75,480
Participation	Number of Participants	0	1,375
Verified Gross Lifecycle Savings	kWh	0	6,300,416
	kW	0	0
	therms	0	433,493
Verified Gross Lifecycle Realization Rate	% (MMBtu)	N/A	98%
Annual NTG Ratio	% (MMBtu)	N/A	87%
Net Annual Savings	kWh/year	0	548,197
	kW	0	0
	therms/year	0	37,714
Net Lifecycle Savings	MMBtu	0	56,416
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	N/A	1.65

[a] The Online Marketplace Program was not available in CY 2018.

Figure 77 shows the percentage of gross lifecycle savings goals achieved by the Online Marketplace Program in CY 2019. The Program did not achieve the electric or natural gas savings goals due to data

upload issues and not ramping up as quickly as expected. The *Program Design, Delivery, and Goals* section of this chapter provides additional information on Program savings relative to CY 2019 goals.

Figure 77. Online Marketplace Program Achievement of CY 2019 Gross Lifecycle Savings Goals



The 100% *ex ante* gross lifecycle savings reflects the Program Implementer's contract goals for CY 2019. Verified gross lifecycle savings contribute to the Program Administrator's portfolio-level goals.

Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted an impact evaluation and a limited process evaluation of the Online Marketplace Program in CY 2019. The Team designed its evaluation, measurement, and verification approach to integrate data sources in assessing Program performance. Table 99 lists the specific data collection and analysis activities and sample sizes used in the evaluations.

Table 99. CY 2019 Online Marketplace Program Data Collection Activities and Sample Sizes

Activity	CY 2019 Sample Size (n)
Program Actor Interviews	1 (Program Administrator)
Tracking Database Review	Census
Engineering Analysis	Census

Program Actor Interview

Cadmus interviewed the Program Administrator in December 2019, just months after the launch of the Online Marketplace Program in September 2019. The interview addressed a range of topics including Program design, interaction with other programs, details about the Program operation, experience operating the Program to date, and feedback from customers.

Tracking Database Review

The Evaluation Team reviewed the census of Online Marketplace Program records in Focus on Energy's database, SPECTRUM. This review involved checking for complete and consistent applications of information across data fields (e.g., measure names, first-year savings applications, EUL applications).

Engineering Analysis

The Evaluation Team reviewed all Online Marketplace records in the CY 2019 tracking database and conducted an engineering analysis to measure the impact of the Online Marketplace Program during its first three months of operation.

Impact Evaluation

The Program reported sales only of advanced power strips and smart thermostats sold through the Marketplace in CY 2019. Although other measures were sold through the Marketplace in CY 2019, the Program Implementer was not able to upload sales data in time for year-end reporting due to problems it encountered configuring the data export. The Program underwent a transition to a new Implementer in early 2020, which further impacted the data upload and retrieval processes. Therefore, this evaluation focuses exclusively on advanced power strips and smart thermostats.

The Evaluation Team did not conduct participant surveys for CY 2019 due to the brevity of the Program implementation period. Instead, the Team relied on evaluated inputs for similar measures offered in other programs, as needed.

Evaluation of Gross Savings

The Evaluation Team applied engineering algorithms from the TRM to a census of reported measures in the CY 2019 SPECTRUM tracking data to verify gross savings.

The 2019 TRM defines measures by the equipment type as well as by Program or delivery mechanism to account for differences in participant behavior that result from differences in Program design. Because the Online Marketplace Program was new in 2019, the 2019 TRM does not include measure entries specific to its delivery. The Program is designed to mirror other online shopping experiences to the maximum extent possible, so it collects little data on participants. This data collection approach is similar to pack-based programs (see *Simple Energy Efficiency* chapter for additional information); therefore, the Program Administrator applied existing pack-based measure savings and assumptions to Online Marketplace Program measures to determine *ex ante* savings. Pack-based savings apply deemed or statewide average inputs, such as fuel types, that can be applied when the actual inputs are unknown.

In evaluating verified savings, the Evaluation Team applied the same pack-based savings inputs but modified the in-service rates (ISRs, see next section). Table 100 shows the *ex ante* and verified per-unit savings for the Online Marketplace Program measures.

Table 100. Online Marketplace Program *Ex Ante* and Verified First-Year Unit Savings

Measure	Quantity	*Ex Ante* Unit Savings			Verified Unit Savings		
		kWh	kW	therms	kWh	kW	therms
Advanced Power Strip, APS Tier 1, Online Store	3	46	0.0061	0	55	0.0072	0
Smart Thermostat, Online Store	1,509	426	0	29	417	0	29

In-Service Rates

The in-service rate (ISR) represents the percentage of Program measures that are installed, in use, and operating as planned. The Program *ex ante* savings apply pack-based default ISRs from the 2019 TRM for both Program measures. To calculate verified savings, the Evaluation Team changed the ISR assumptions for both advanced power strips and smart thermostats to better reflect the Program's retail design.

The 2019 TRM provides default advanced power strip installation rates based on survey data for pack-based delivery channels and retail delivery channels. The pack-based ISR is lower, probably because participants have more control over the items they receive through a retail delivery channel and may have to pay a higher price to receive them. Since the Marketplace is a retail channel, the Evaluation Team used the retail ISR for Program advanced power strips.

The 2019 TRM assumes 100% installation for smart thermostats that use a pack-based delivery channel and does not provide a default ISR for retail smart thermostats. Instead of the 2019 TRM value, the Evaluation Team used the smart thermostat ISR for the Retail Lighting and Appliance Program, which is based on survey data from CY 2018 participants and was not available in the 2019 TRM. The Retail Lighting and Appliance Program also provides instant discounts for smart thermostats sold online, making it a good proxy for the Online Marketplace Program.

Table 101 shows differences between ISRs used to determine *ex ante* and verified savings and the ISR sources.

Table 101. *Ex Ante* and Verified In-Service Rates

Measure	*Ex Ante* ISR		Verified ISR	
	ISR	Source	ISR	Source
Advanced Power Strip, APS Tier 1, Online Store	68%	MMID 3895	81%	MMID 4275
Smart Thermostat, Online Store	100%	MMID 4304	98%	2018 Retail Lighting and Appliance Participant Survey

Verified Gross Savings Results

Table 102 lists the annual and lifecycle realization rates for the CY 2019 Online Marketplace Program. Overall, the Program achieved a first-year evaluated realization rate of 98%, weighted by total (MMBtu) energy savings. Realization rates for the Program were driven entirely by differences between ISRs used in *ex ante* and verified savings. Totals presented in this report represent a weighted average realization rate for the entire Program.

Table 102. CY 2019 Online Marketplace Program Annual and Lifecycle Realization Rates

Measure	Annual Realization Rate				Lifecycle Realization Rate			
	kWh	kW	therms	MMBtu	kWh	kW	therms	MMBtu
Advanced Power Strip, APS Tier 1, Online Store	119%	119%	N/A	119%	119%	119%	N/A	119%
Smart Thermostat, Online Store	98%	N/A	98%	98%	98%	N/A	98%	98%
Total	**98%**	**119%**	**98%**	**98%**	**98%**	**119%**	**98%**	**98%**

Table 103 lists *ex ante* and verified annual gross savings for the Program for CY 2019 by measure type.

Table 103. CY 2019 Online Marketplace Program First-Year Gross Savings Summary

Measure	*Ex Ante* Gross First Year			Verified Gross First Year		
	kWh	kW	therms	kWh	kW	therms
Advanced Power Strip, APS Tier 1, Online Store	138	0	0	164	0	0
Smart Thermostat, Online Store	642,799	0	44,234	629,943	0	43,349
Total First Year	**642,937**	**0**	**44,234**	**630,107**	**0**	**43,349**

Table 104 lists *ex ante* and verified gross lifecycle savings by measure type for the Program in CY 2019.

Table 104. CY 2019 Online Marketplace Program Lifecycle Gross Savings Summary

Measure	*Ex Ante* Gross Lifecycle			Verified Gross Lifecycle		
	kWh	kW	therms	kWh	kW	therms
Advanced Power Strip, APS Tier 1, Online Store	828	0	0	986	0	0
Smart Thermostat, Online Store	6,427,990	0	442,340	6,299,430	0	433,493
Total Lifecycle	**6,428,818**	**0**	**442,340**	**6,300,416**	**0**	**433,493**

Evaluation of Net Savings

The Evaluation Team benchmarked measure-specific NTG values for the Online Marketplace advanced power strips and smart thermostats by reviewing several evaluations from other online store programs. The Team identified three other programs with NTGs for one or both of these measures. Table 105 lists the NTGs by measure for the benchmarked online market programs and the average NTG applied to the measures in the Focus on Energy Online Marketplace Program.

Table 105. NTGs for Various Online Market Programs by Measure

Measure	Online Market Programs			Average NTG Applied to Focus on Energy Online Marketplace
	Utility 1	Utility 2	Utility 3	
Advanced Power Strip	86%		92%	**89%**
Smart Thermostat	95%	79%		**87%**

Verified Net Savings Results

The Evaluation Team applied the average of the benchmarked NTGs listed in Table 105 to determine the net savings for the Online Marketplace measures in CY 2019. Table 106 shows total net-of-freeridership savings, participant spillover savings, total net savings in MMBtu, and overall Program NTG.

Table 106. Online Marketplace Program Annual Net Savings and NTG

Net-of-Freeridership Savings (MMBtu)	Participant Spillover Savings (MMBtu)	Total First-Year Gross Verified Savings (MMBtu)	Total First-Year Net Savings (MMBtu)	Program First-Year NTG Ratio
5,642	0	6,485	5,642	87%

Table 107 shows the annual net demand and energy impacts (kWh, kW, and therms) by measure category for the Program. The Evaluation Team attributed these savings as net of what would have occurred naturally without the presence of the Program.

Table 107. Online Marketplace Program Annual Net Savings

Measure	First-Year Net		
	kWh	kW	therms
Advanced Power Strip, APS Tier 1, Online Store	146	0	0
Smart Thermostat, Online Store	548,050	0	37,714
Total First Year	**548,197**	**0**	**37,714**

Table 108 lists the lifecycle net demand and energy impacts (kWh, kW, and therms) by measure category for the Program.

Table 108. Online Marketplace Program Lifecycle Net Savings

Measure	Lifecycle Net		
	kWh	kW	therms
Advanced Power Strip, APS Tier 1, Online Store	878	0	0
Smart Thermostat, Online Store	5,480,504	0	377,139
Total Lifecycle	**5,481,382**	**0**	**377,139**

Process Evaluation

Because the Online Marketplace launched late in CY 2019, the Evaluation Team limited the process evaluation to documenting the purpose and design of the Program and capturing any lessons learned from the initial launch. The Team focused on the following key topics:

- Program design, delivery, and coordination among the Program Administrator, Program Implementer, and utility partners
- Market barriers and solutions
- Implementation experience to date
- Customer response to date

Program Design, Delivery, and Goals

The Evaluation Team interviewed key Program Administrator staff to understand the market barriers the Program is expected to address and to obtain an overview of its design and delivery processes.

As described by the Program Administrator, the Marketplace is intended as a new delivery channel for Focus on Energy residential customers interested in purchasing eligible energy efficiency products. It is intended to provide a shopping experience similar to Amazon.com or other major online retailers by offering a wide range of products in an attractive and easily navigable platform at prices comparable to a big-box retailer. The Marketplace is also intended to be easily accessible by all Focus on Energy customers. The Focus on Energy branding will reinforce its sponsorship of the site to all customers.

According to the interview with the Program Administrator, sales of all measures in CY 2019 (including those not reported until CY 2020) were around 50% of the sales forecasted for the three months the Program was active. For this reason, the Program Implementer reduced the budget for the Online Marketplace by 50% and allocated those funds to other programs. Because the initial-year contract with the Implementer was not conditional on the savings target, the Program Administrator did not adjust the savings target for the Program.

Program Management and Delivery Structure

The Online Marketplace portal was operated by Uplight. The Program Implementer provided a basic platform that it customized with Focus on Energy's branding.[61] As of December 2019, the site offered two to three brands for each eligible measure.

The program is designed to mirror other online shopping experiences as much as possible. The rebate amount is deducted from the price at the time of purchase. The customer does not need to submit any forms or additional information. The Program Implementer captures key product and customer details, including product type, model number and serial numbers, quantity, delivery address, and rebate amount. It then submits the product and customer data to the Program Administrator, which reviews the data, adds customer account numbers, and uploads to the tracking database.

Program Goals

The Program's overall objective is to encourage residential customers to use more energy-efficient products. For CY 2019, Focus on Energy set the following savings goals:[62]

- Demand reduction of 168 kW
- Lifecycle electric savings of 42,228,452 kWh
- Lifecycle natural gas savings of 1,307,727 therms

The Program did not achieve the demand reduction, electrical savings, or gas savings goals in CY 2019, based on the measures reported in SPECTRUM. However, the verified savings do not include other measures that were sold in CY 2019 and not recorded in SPECTRUM by the end of the year. Savings from these additional measures would have brought the Program closer to its targets.

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[61] Uplight partners directly with manufacturers to offer eligible products through the website. These partnerships may include other utility territories and not be specific to Focus on Energy. Neither Focus on Energy nor the Program Administrator are involved in these partnership arrangements.

[62] Metrics presented in this section represent Focus on Energy's targets for the Program and not the contractual goals for the Program Implementer. The Program Implementer is required to meet a gross lifecycle MMBtu goal in addition to fuel-specific savings targets.

Marketing and Outreach

The Program Implementer marketed the Program primarily through social media channels. Where possible, it worked with manufacturers to take advantage of manufacturer promotions on eligible products in coordination with the rebate offer. For example, in CY 2019, the Implementer promoted a limited-time offer of a free Google Home Mini with the purchase of a Nest smart thermostat.

Marketing efforts were targeted to eligible Focus on Energy customers. The Implementer monitored the effectiveness of different marketing campaigns by tracking "click" data for online ads and posts. These data were available to the Program Administrator on request.

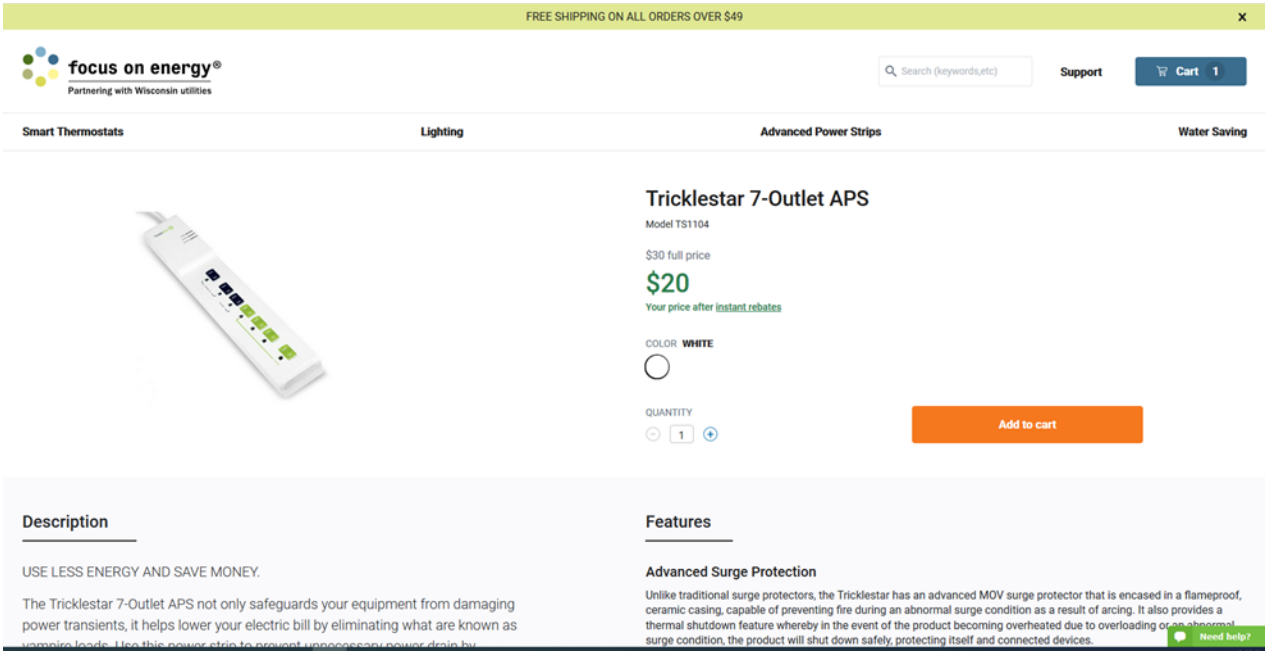
The Program Administrator believed the CY 2019 marketing relied too heavily on social media alone. In CY 2020, the Program Administrator expects the new Implementer to coordinate marketing with other Focus on Energy marketing campaigns through email blasts and online search ads.

In CY 2019, the Program was not expected to serve as a cross-marketing opportunity to promote other Focus on Energy programs. Nevertheless, the Program Administrator noted that this may change in the future depending on the Program's success.

Customer Experience

The site allowed users to search for products and filter and sort search results by product brands, specific features, price, and other criteria. Each product page offered a product description, detailed specifications, point-by-point comparison to other similar products, and the price before and after the Program rebate. In addition, the site offered free shipping for orders over $49, comparable to other online retailers. Figure 78 presents an example of a product page on the Online Marketplace.

Figure 78. Presentation of Eligible Advanced Power Strip on Online Marketplace



The site was not restricted to Focus on Energy customers, and any user could make a purchase through the site. However, rebates were applied only if users could certify they were eligible. To determine eligibility for rebates, users provided their address and the name of their utility provider and agreed to the site's terms and conditions. On the checkout page, users could click a link to view the terms and conditions, which were as follows:

- I certify that my home is heated with a natural gas furnace, natural gas boiler or air source heat pump
- I certify that my home is not heated with liquid petroleum or geothermal gas
- I certify that I am installing this device in the home serviced by my utility

The site verified the service provider information using a zip code lookup. Users were not required to enter utility account numbers. Products could be shipped only to the service delivery address provided by the user during the checkout. The site tracked participation limits, such as no more than two smart thermostats per household, based on the property address provided.

The Program Administrator did not have data on customer feedback at the time of the interview. The Implementer offered user support through multiple channels, including an email option, phone option, and a live chat function. However, the site did not issue exit surveys to collect participant feedback. The Evaluation Team plans to begin collecting participant feedback through participant satisfaction surveys in CY 2020.

Through weekly coordination meetings with the Implementer, the Program Administrator was aware of some hosting issues on Black Friday (the day after Thanksgiving), due to a high volume of shoppers, but reported these were minor and had been addressed. In its review, the Evaluation Team noted that the website was not supported on Internet Explorer but otherwise found no issues with access.

Program Cost-Effectiveness

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

Table 109 lists the CY 2019 incentive costs for the Online Marketplace Program.

Table 109. Online Marketplace Program Incentive Costs

	CY 2019
Incentive Costs	$75,480

The Evaluation Team found that the CY 2019 Online Marketplace Program was cost-effective (1.65). Table 110 lists the evaluated costs and benefits.

Table 110. Online Marketplace Program Costs and Benefits

Cost and Benefit Category	CY 2019
Costs	
Administration Costs	$0
Delivery Costs	$114,000
Incremental Measure Costs	$289,118
Total Non-Incentive Costs	**$403,118**
Benefits	
Electric Benefits (kWh)	$280,946
Electric Benefits (kW)	$17
Gas Benefits	$278,910
Emissions Benefits	$106,024
Total TRC Benefits	**$665,897**
Net TRC Benefits	**$262,779**
TRC B/C Ratio	**1.65**

Evaluation Outcomes and Recommendations

The Evaluation Team compiled the following outcomes and recommendations to improve the Online Marketplace Program.

Outcome 1. The Program's ramp-up during its first quarter was slower than expected, achieving about 50% of forecasted sales (including sales that will be reported in CY 2020). The Program has yet to demonstrate the viability of the Program concept. It is not abnormal for a new program to require a ramp-up period before it reaches its full participation capacity. The Implementer's data management issues, the limited marketing (see Outcome 3), and the limited number and types of products available in CY 2019 may have hampered a faster ramp-up. Given the short implementation time reviewed in this report, the Program may be able to increase its impact.

Recommendation 1. The Evaluation Team supports the Program Administrator's goal to work with the new Implementer to make additional energy efficiency measures available through the Marketplace in CY 2020. Additional variety should increase the site's usefulness and appeal for customers.

Outcome 2. The appearance and function of the site in CY 2019 appeared to meet its objective of providing rebated products through a shopping experience similar to that of major online retail sites. The site had a polished appearance and intuitive structure and offered many of the same tools and features (such as search filters and detailed product information) as other online sites.

Outcome 3. Social media channels alone are not likely to drive enough awareness of the Online Marketplace to meet sales targets. The Program Administrator reported that sales were below targets that were forecasted before launching the Program. The Program Administrator also reported that marketing was primarily through social media channels in CY 2019.

Recommendation 2. The Evaluation Team agrees with the Program Administrator that a broader marketing campaign, integrated with other Focus on Energy marketing, may help the Program achieve its sales targets. Before initiating a broader marketing campaign, the Program Implementer should ensure the portal infrastructure is robust enough to manage greater user traffic.

Retail Lighting and Appliance Program

Through its Retail Lighting and Appliance Program, Focus on Energy works with manufacturers and retailer partners to provide point-of-sale discounts and downstream rebates on qualified lighting and consumer products to residential customers throughout Wisconsin.

In CY 2019, eligible measures included LEDs, advanced power strips, smart thermostats, and low-E storm windows. Discounted measures are available through brick and mortar stores, pop-up retail events, and online retailer websites. The Program also offers a downstream (after purchase) rebate option for smart thermostats, which can be applied to units purchased through any retailer that does not already offer Program discounts. Focus on Energy also offers a wide range of retail support such as training to retail staff, in-store display materials, and marketing activities.

In CY 2019, APTIM was the Program Administrator, and ICF was the Program Implementer.

As part of the PSC's initiative to enhance Focus on Energy services to rural customers, the Program Implementor expanded the pop-up retail events to target designated rural sites in CY 2019.[63] The Program Administrator assigned a separate budget to cover the rural pop-up effort and tracked results against a separate savings target.

This report presents spending, savings, and other key metrics for the core Retail Lighting and Appliance Program separately from the Rural Pop-Up Events, unless otherwise noted.

Table 111 lists actual Program spending, savings, participation, and cost-effectiveness for the core Retail Lighting and Appliance Program in CY 2019.

[63] Focus on Energy designated rural areas by zip code according to U.S. Census Bureau data.

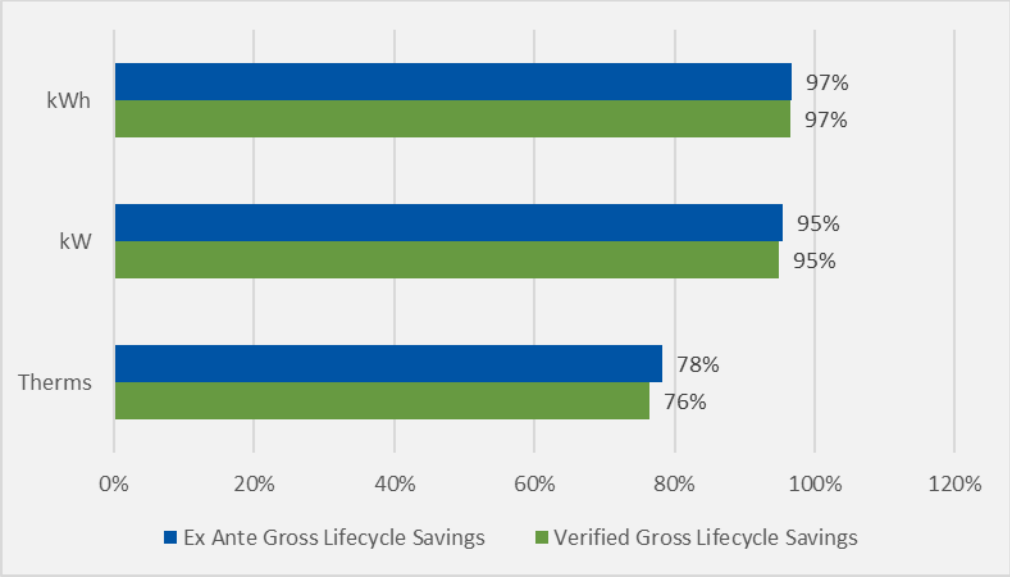
Table 111. CY 2019 Retail Lighting and Appliance Program Summary

Item	Units	CY 2018	CY 2019
Incentive Spending	$	$10,543,539	$9,241,518
Participation	Number of Participants	920,738	832,554
Verified Gross Lifecycle Savings	kWh	3,563,832,255	3,084,420,646
	kW	23,817	22,252
	therms	3,541,862	3,162,593
Verified Gross Lifecycle Realization Rate	% (MMBtu)	90%	100%
Annual NTG Ratio	% (MMBtu)	53%	32%
Net Annual Savings	kWh/year	107,748,877	59,055,022
	kW	12,144	6,567
	therms/year	260,069	206,759
Net Lifecycle Savings	MMBtu	6,510,618	3,382,072
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	5.26	4.75

Note: CY 2018, costs and savings included program activity for pop-up retail events in rural areas. Beginning in CY 2019, Pop-Up Retail Events in targeted rural areas were budgeted and evaluated separately from standard Pop-Up Retail Events.

Figure 79 shows the percentage of gross lifecycle savings goals achieved by the core Retail Lighting and Appliance Program in CY 2019. The Program did not achieve the *ex ante* or verified electric and gas savings goals.

Figure 79. Retail Lighting and Appliance Program Achievement of CY 2019 Gross Lifecycle Savings Goals



The 100% *ex ante* gross lifecycle savings reflects the Program Implementer's contract goals for CY 2019. Verified gross lifecycle savings contribute to the Program Administrator's portfolio-level goals.

Table 112 lists actual Program spending, savings, participation, and cost-effectiveness for the Rural Pop-Up Events in CY 2019.

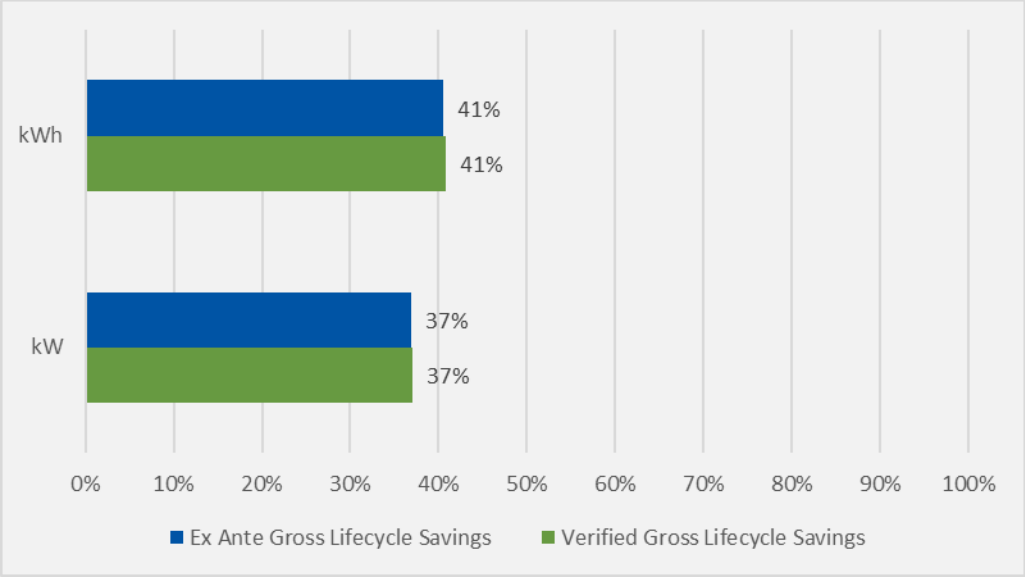
Table 112. CY 2019 Rural Pop-Up Events Summary

Item	Units	CY 2018	CY 2019
Incentive Spending	$	$0	$282,129
Participation	Number of Participants	0	12,850
Verified Gross Lifecycle Savings	kWh	0	3,158,994
	kW	0	369
	therms	0	0
Verified Gross Lifecycle Realization Rate	% (MMBtu)	N/A	101%
Annual NTG Ratio	% (MMBtu)	N/A	30%
Net Annual Savings	kWh/year	0	940,318
	kW	0	110
	therms/year	0	0
Net Lifecycle Savings	MMBtu	0	48,377
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	N/A	1.58

Note: Beginning in CY 2019, at the direction of the PSC, Pop-Up Retail Events in targeted rural areas were budgeted and evaluated separately from standard Pop-Up Retail Events. Prior to CY 2019, Pop-Up Retail Events occurring in rural areas were budgeted and tracked as part of the overall Pop-Up Retail component of the Retail Lighting and Appliance Program.

Figure 80 shows the percentage of gross lifecycle savings goals achieved by the Rural Pop-Up Events in CY 2019. The Events did not achieve the *ex ante* or verified electric savings goals.

Figure 80. Rural Pop-Up Events Achievement of CY 2019 Gross Lifecycle Savings Goals



The 100% *ex ante* gross lifecycle savings reflects the Program Implementer's contract goals for CY 2019. Verified gross lifecycle savings contribute to the Program Administrator's portfolio-level goals.

Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted an impact evaluation and limited process evaluation of the Retail Lighting and Appliance Program and the Rural Pop-Up Events in CY 2019. The Team designed its EM&V approach to integrate multiple perspectives in assessing Program performance. Table 113 lists specific data collection activities and sample sizes used in the evaluations. All activities were done for both the core Retail Lighting and Appliance Program and the Rural Pop-Up Events.

Table 113. CY 2019 Data Collection Activities and Sample Sizes

Activity	CY 2019 Sample Size (n)
Program Actor Interviews	2 (Program Administrator and Program Implementer)
Tracking Database Review	Census
Ongoing Participant Satisfaction Surveys	1,006

Program Actor Interviews

The Evaluation Team interviewed the Program Administrator and the Program Implementer in September 2019. The interviews focused on high-level changes in CY 2019 and the outcomes of those changes, general performance including areas of success and potential concerns, and potential changes for CY 2020.

Tracking Database Review

The Evaluation Team reviewed the census of Retail Lighting and Appliance and Rural Pop-Up Events records in SPECTRUM, the Focus on Energy database. This review involved completing the following tasks:

- Reassign savings from database adjustment measures to corresponding program measures
- Check for complete and consistent applications of information across data fields (e.g., measure names, first-year savings applications, effective useful life [EUL] applications)

Ongoing Participant Satisfaction Surveys

The PSC requested that the Evaluation Team conduct satisfaction surveys beginning in CY 2019 for the CY 2019–CY 2022 quadrennium, continuing the practice established for the previous quadrennium in CY 2015. There were two objectives for these satisfaction surveys:

- Understand customer satisfaction on an ongoing basis and respond to any changes in satisfaction before the end of the annual reporting schedule
- Help to facilitate timely follow-up with customers to clarify and address service concerns

The Team used SPECTRUM data to sample CY 2019 participants and administered web-based satisfaction surveys throughout the year. The Team mailed paper surveys to participants with no email address on file. The Team combined results from both modes to conduct the analysis. A total of 1,006 Retail Lighting and Appliance Program participants (807 retail smart thermostat, 24 online coupon smart thermostat, and 175 pop-up retail) responded to the CY 2019 survey.

The survey covered several topics, such as the following:

- Overall satisfaction
- Satisfaction with Program staff and Trade Allies
- Likelihood of recommending the Program
- Likelihood of initiating another energy efficiency improvement
- Open feedback regarding the Program (comments and suggestions)

Impact Evaluation

The Evaluation Team used the following approaches to measure the impact of the Retail Lighting and Appliance Program:

- Tracking database review
- Engineering reviews
- Sales data modeling

The Evaluation Team calculated gross savings for each individual bulb sold through the Program using the bulb's model information and inputs calculated from the gross savings methods (database reviews and engineering reviews). The Team calculated gross savings for smart thermostats and advanced power strips using algorithms and inputs listed in the TRM.

To determine an overall Program NTG ratio, the Evaluation Team used results from national LED sales data modeling, low-E storm window sales data modeling, and CY 2018 participant survey results.

Evaluation of Gross Savings

The Evaluation Team used the CY 2019 tracking data to gather reported installations then applied the results from engineering reviews to determine verified gross savings.

Tracking Database Review

The Evaluation Team reviewed the census of CY 2019 Retail Lighting and Appliance Program data in SPECTRUM for appropriate and consistent application of unit-level savings and EUL values in adherence with the TRM or other deemed savings sources. All inputs used in the SPECTRUM database were consistent with the deemed values in the TRM.

The Evaluation Team also reviewed CY 2019 LED and low-E storm window sales data for information required to calculate savings and found complete data for all the inputs used in the gross savings analysis (such as model number, measure description, quantity, and wattage).

To verify the lighting dataset, the Team used the model number and description of each bulb to gather data on lumens, wattage, and bulb type from the ENERGY STAR lighting database. The Team was able to match 95% of the total bulbs listed in the Program and 99% of the total bulbs listed in the Rural Pop-Up Events. For bulbs that were not matched in the ENERGY STAR database, the Team deferred to the values

listed with online retailers or in the tracking database. The Team applied other inputs for the savings analysis, such as hours of use, from the TRM and made no adjustments to the tracking data.

A comprehensive list of *ex ante* and verified inputs are provided in *Appendix H. Measure Analysis* in Volume III.

Verified Unit Energy Savings

The Evaluation Team calculated verified, gross unit energy savings (UES) and demand reduction for all measures in the Retail Lighting and Appliance Program and Rural Pop-Up Events following algorithms and inputs in the TRM. Exceptions to this include delta watts, lighting cross-sector sales, in-service rates (ISRs), and low-E storm windows, which are all described below. Additional details about algorithms, inputs, and data sources for all verified savings calculations are available in *Appendix H*.

Delta Watts Analysis

The Evaluation Team employed the lumen equivalence methodology to determine the baseline wattage for each Program bulb. Calculating the difference between the baseline and efficient wattages provided the delta watts input.

The Evaluation Team matched individual bulbs from the Program Implementer's tracking database, using its model number, to its corresponding listing in the ENERGY STAR-qualified product list database. The ENERGY STAR database provided other product details for each bulb, including lumen output, rated wattage, type, and ENERGY STAR certification status. If these data were not available, the Evaluation Team used the database values for lumens, efficient wattage, or both from the Program Implementer's database or conducted internet searches based on product make and model numbers.

The Evaluation Team then categorized each bulb into specific bins, based on the bulb lumen output and type. Each bin had an assumed baseline wattage for use in the delta watts calculation. The Uniform Methods Project (UMP) provides lumen bins for standard, decorative, globe, and EISA-exempt lamps.[64] For example, the bins and associated baseline halogen watts for standard bulbs are shown in Table 114.

[64] National Renewable Energy Laboratory. February 2015. *The Uniform Methods Project: Methods for Determining Energy Efficiency Savings for Specific Measures.* "Chapter 21: Residential Lighting Evaluation Protocol." Prepared by Apex Analytics, LLC. http://energy.gov/sites/prod/files/2015/02/f19/UMPChapter21-residential-lighting-evaluation-protocol.pdf

Table 114. EISA (Phase 1) Lumen Bins and Baseline Watts for Standard Bulbs

Lumen Bin	CY 2019 EISA Baseline	EISA
0–309	25	Not impacted by EISA
310–449	25	Impacted by EISA
450–799	29	
800–1,099	43	
1,100–1,599	53	
1,600–1,999	72	
2,000–2,600	72	
2,601–3,300	150	Not impacted by EISA
3,301–4,815	200	

Source: December 19, 2007. *Energy Independence and Security Act of 2007*. Public Law 110-140-. 121 Stat. 1492. https://www.gpo.gov/fdsys/pkg/PLAW-110publ140/pdf/PLAW-110publ140.pdf

Note that in December 2016, the U.S. Department of Energy (DOE) issued two final rules: one proposing to keep the existing EISA Phase 2 backstop provision set to take effect on January 1, 2020, and one expanding the definition of EISA general service lamps (and thus the types of lamps impacted by the backstop provision) to include several previously exempted lamps, including globes, candelabras, reflectors, and lamps up to 3,300 lumens. In September 2019, the DOE issued a final rule that states the EISA 2020 backstop has not been triggered, allowing manufacturers and retailers to continue to produce and sell inefficient lighting products beyond January 1, 2020. Due to the legal challenges to DOE's rule, the litigation could be prolonged, thus allowing halogens and incandescent lamps to be available for the foreseeable future.

U.S. Department of Energy. September 2019. "Energy Conservation Program: Definition for General Service Lamps." 10 CFR Part 430, RIN 1904-AE26. https://s3.amazonaws.com/public-inspection.federalregister.gov/2019-18940.pdf

EISA affects bulbs only in the 310 lumen to 2,600 lumen output range. The Evaluation Team applied a similar methodology to categorize specialty bulbs, reflectors, and EISA-exempt bulbs into their respective bins with different lumen ranges and different baselines.

To determine the lumen bins for reflectors, the UMP defers to federal requirements and does not list lumen bins explicitly. Based on federal requirements, the Mid-Atlantic TRM defines lumen bins for six categories of reflector types and diameters.[65]

The average delta watts for each category compared to the *ex ante* delta watts are shown in Table 115 (Retail Lighting and Appliance) and Table 116 (Rural Pop-Up Events). The *ex ante* delta watts are based on values deemed in the TRM and not directly on the sales data, which can vary within each measure category.

The Team calculated the average verified gross delta watts by subtracting the wattage of the efficient bulb from the baseline wattage as determined from its lumen bin. This causes the variation shown between the *ex ante* delta watts and the evaluated delta watts. Similar to CY 2018, the comparison shows strong agreement between the verified and *ex ante* delta watts values.

[65] Northeast Energy Efficiency Partnership. October 2019. *Mid-Atlantic Technical Reference Manual*. Version 9.0. https://neep.org/mid-atlantic-technical-reference-manual-trm-v9

Table 115. CY 2019 Retail Lighting and Appliance Program *Ex Ante* and Verified Gross Delta Watts

Measure	*Ex Ante* Delta Watts	Average Verified Gross Delta Watts
LED, Reflector	53	52
LED, Omnidirectional, 310–749 Lumens	22	28
LED, Omnidirectional, 750–1,049 Lumens	32	34
LED, Omnidirectional, 1,050–1,489 Lumens	40	42
LED, Omnidirectional, 1,490–2,600 Lumens	55	56

Table 116. CY 2019 Rural Pop-Up *Ex Ante* and Verified Gross Delta Watts

Measure	*Ex Ante* Delta Watts	Average Verified Gross Delta Watts
LED, Reflector	53	55
LED, Omnidirectional, 310–749 Lumens	22	29
LED, Omnidirectional, 750–1,049 Lumens	32	34
LED, Omnidirectional, 1,050–1,489 Lumens	40	42
LED, Omnidirectional, 1,490–2,600 Lumens	55	56

Cross-Sector Sales

In CY 2015, the Evaluation Team conducted a residential general population survey and surveyed a subset of Focus on Energy small business customers to estimate the percentage of customers (from each population) who purchased CFLs, LEDs, or both from a participating retailer during the previous 12 months. Because store intercept studies and the phone surveys have inherent biases specific to the populations they target and the methods they employ, the Team combined the results from the CY 2015 phone survey (6.0%) with those from the CY 2014 intercept study (7.1%), for an average cross-sector sales proportion of 6.6%.

Because there had been no substantial changes to the Program design or population from CY 2015 to CY 2019, the Evaluation Team applied the 6.6% cross-sector sales proportion to CY 2019 bulbs. *Appendix I* of the *Focus on Energy CY 2015 Evaluation Report* describes the full methodology and findings of the cross-sector sales analysis.[66] The verified gross unit savings separated by residential and nonresidential savings for CY 2019 are presented in *Appendix H. Measure Analysis* of Volume III.

In-Service Rates (ISR)

The ISR represents the percentage of measures still installed and in use following Program participation. In CY 2019, the Evaluation Team applied ISRs from the TRM to all measures except smart thermostats, for which the Team applied the ISR from CY 2018 participant surveys. Table 117 lists the measure-specific ISRs that the Team applied to all measures within the measure category.

[66] Cadmus. May 20, 2016. *Focus on Energy CY 2015 Evaluation Report.* https://www.focusonenergy.com/sites/default/files/WI%20FOE%20CY%202015%20Appendices.pdf

Table 117. Measure-Specific In-Service Rates

Measure	ISR	Source
LED	56% (first-year)[a] 87% (lifetime)[b]	TRM; CY 2017 In-home audits
Low-E Storm Windows	100%	TRM; Assumed
Advanced Power Strips	81%	TRM; CY 2018 Participant survey
Smart Thermostats	98%	CY 2018 Participant survey

[a] First-year ISR represents the percentage of bulbs that were installed within 12 months of the bulbs' purchase.

[b] Lifetime ISRs account for the installation of bulbs that are initially put into storage and installed in future years. In CY 2017, the Evaluation Team calculated an installation trajectory over six years that resulted in a net present value ISR, or lifetime ISR, of 87%.

Low-E Storm Windows

Program tracking data included stock window measures (windows that the participating retailer carried in the store) and custom window measures (special sizes of windows that the customer had to order through the retailer). The Team found that window size information, an input in the TRM savings algorithm, varied by the type of window.

- **Stock window data did include window sizes.** The Team found that these windows were slightly smaller than TRM assumptions (10.7 square feet compared to 13.2 square feet in the TRM). For these measures, the Team calculated verified gross savings using the actual window sizes following the algorithm in the TRM.
- **Custom window data did not include window sizes.** For these measures, the Team applied TRM default savings.

Differences in annual unit savings between stock and custom windows, as well as weighted average savings, are shown in Table 118.

Table 118. Stock and Custom Window Annual Savings

Window Type	Peak Savings (kW)	Annual Savings (kWh)	Annual Savings (therms)	Number of Units
Stock	0.0062	5.95	3.40	1,839
Custom	0.0076	7.31	4.20	5,847
Weighted Average	**0.0073**	**6.98**	**4.01**	**7,686**[a]

[a] The number of units listed in this table reflect the number of windows included in CY 2019 sales data provided by the Implementer. The sales data only included windows that were sold after the Program updated window eligibility criteria in Q2 2019 (see the *Program Changes* section below). Program tracking data included an additional 518 windows that were sold in late CY 2018 and recorded in CY 2019 or were sold in early CY 2019 before the Program updated eligibility criteria.

Verified Gross Savings Results

Table 119 lists the annual and lifecycle realization rates for the CY 2019 Retail Lighting and Appliance Program. Overall, the Program achieved a first-year evaluated realization rate of 100%, weighted by total (MMBtu) energy savings.

Table 119. CY 2019 Retail Lighting and Appliance Program Annual and Lifecycle Realization Rates

Measure	MMID	Annual Realization Rate				Lifecycle Realization Rate			
		kWh	kW	therms	MMBtu	kWh	kW	therms	MMBtu
Adjustment Measure, Incentive Only	4850	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Advanced Power Strip, Retail, APS Tier 1	4275	100%	100%	N/A	100%	100%	100%	N/A	100%
LED, Omnidirectional, 1,050-1,489 Lumens, Long Lifetime, Retail Store Markdown	4311	102%	104%	N/A	102%	102%	104%	N/A	102%
LED, Omnidirectional, 1,050-1,489 Lumens, Retail Store Markdown	4310	102%	104%	N/A	102%	102%	104%	N/A	102%
LED, Omnidirectional, 1,490-2,600 Lumens, Long Lifetime, Retail Store Markdown	4313	99%	97%	N/A	99%	99%	97%	N/A	99%
LED, Omnidirectional, 1,490-2,600 Lumens, Retail Store Markdown	4312	99%	97%	N/A	99%	99%	97%	N/A	99%
LED, Omnidirectional, 310-749 Lumens, Long Lifetime, Retail Store Markdown	4307	96%	97%	N/A	96%	96%	97%	N/A	96%
LED, Omnidirectional, 310-749 Lumens, Retail Store Markdown	3553	96%	97%	N/A	96%	96%	97%	N/A	96%
LED, Omnidirectional, 750-1,049 Lumens, Long Lifetime, Retail Store Markdown	4309	101%	101%	N/A	101%	101%	101%	N/A	101%
LED, Omnidirectional, 750-1,049 Lumens, Retail Store Markdown	4308	101%	101%	N/A	101%	101%	101%	N/A	101%
LED, Reflector, 12 watt, Retail Store Markdown	3557	98%	98%	N/A	98%	98%	98%	N/A	98%
LED, Reflector, 12 Watt, Retail Store Markdown, Long Lifetime	4306	98%	98%	N/A	98%	98%	98%	N/A	98%
Low-E Storm Window, Single-Family, Retail Channel	4681	96%	95%	95%	95%	96%	95%	95%	95%
Smart Thermostat, Existing Air Source Heat Pump	4303	98%	N/A	N/A	98%	98%	N/A	N/A	98%
Smart Thermostat, Existing Natural Gas Boiler	4301	98%	N/A	98%	98%	98%	N/A	98%	98%
Smart Thermostat, Existing Natural Gas Furnace	4302	98%	N/A	98%	98%	98%	N/A	98%	98%
Total		**100%**	**99%**	**98%**	**100%**	**100%**	**99%**	**98%**	**100%**

Table 120 list the annual and lifecycle realization rates for the CY 2019 Rural Pop-Up Events. Overall, it achieved a first-year evaluated realization rate of 101%, weighted by total (MMBtu) energy savings.

Table 120. CY 2019 Rural Pop-Up Events Annual and Lifecycle Realization Rates

Measure	MMID	Annual Realization Rate				Lifecycle Realization Rate			
		kWh	kW	therms	MMBtu	kWh	kW	therms	MMBtu
Advanced Power Strip, Retail, APS Tier 1	4275	100%	100%	N/A	100%	100%	100%	N/A	100%
LED, Omnidirectional, 1,050-1,489 Lumens, Retail Store Markdown	4310	101%	103%	N/A	101%	101%	103%	N/A	101%
LED, Omnidirectional, 1,490-2,600 Lumens, Long Lifetime, Retail Store Markdown	4313	99%	98%	N/A	99%	99%	98%	N/A	99%
LED, Omnidirectional, 1,490-2,600 Lumens, Retail Store Markdown	4312	99%	98%	N/A	99%	99%	98%	N/A	99%
LED, Omnidirectional, 310-749 Lumens, Long Lifetime, Retail Store Markdown	4307	100%	100%	N/A	100%	100%	100%	N/A	100%
LED, Omnidirectional, 310-749 Lumens, Retail Store Markdown	3553	100%	100%	N/A	100%	100%	100%	N/A	100%
LED, Omnidirectional, 750-1,049 Lumens, Long Lifetime, Retail Store Markdown	4309	101%	100%	N/A	101%	101%	100%	N/A	101%
LED, Omnidirectional, 750-1,049 Lumens, Retail Store Markdown	4308	101%	100%	N/A	101%	101%	100%	N/A	101%
LED, Reflector, 12 watt, Retail Store Markdown	3557	104%	103%	N/A	104%	104%	103%	N/A	104%
LED, Reflector, 12 Watt, Retail Store Markdown, Long Lifetime	4306	104%	103%	N/A	104%	104%	103%	N/A	104%
Total		**101%**	**100%**	**N/A**	**101%**	**101%**	**100%**	**N/A**	**101%**

Factors causing realization rates to vary from 100% are these:

- **Lighting.** Difference in delta watts between verified and *ex ante* savings affected realization rates.
- **Windows.** Differences between actual window sizes of stock windows and default sizes listed in the TRM resulted in verified stock window savings that are lower than *ex ante* savings, thus causing the realization rate to be less than 100%.
- **Smart thermostats.** Applying the ISR from CY 2018 participant surveys caused the realization rate to be less than 100%.

Table 121 lists realization rates for the annual and lifecycle gross savings for the CY 2019 Retail Lighting and Appliance Program by measure type.

Table 121. CY 2019 Retail Lighting and Appliance Program
Annual and Lifecycle Realization Rate Summary by Measure Type

Measure	Annual Realization Rate			Lifecycle Realization Rate		
	kWh	kW	Therms	kWh	kW	Therms
Lighting	100%	99%	N/A	100%	99%	N/A
Non-Lighting	98%	95%	98%	98%	95%	98%
Average	**100%**	**99%**	**98%**	**100%**	**99%**	**98%**

Table 122 lists realization rates for the annual and lifecycle gross savings for the CY 2019 Rural Pop-Up Events by measure type.

Table 122. CY 2019 Rural Pop-Up Events Annual and Lifecycle
Realization Rate Summary by Measure Type

Measure	Annual Realization Rate			Lifecycle Realization Rate		
	kWh	kW	Therms	kWh	kW	Therms
Lighting	101%	100%	N/A	101%	100%	N/A
Non-Lighting	100%	100%	N/A	100%	100%	N/A
Average	**101%**	**100%**	**N/A**	**101%**	**100%**	**N/A**

Table 123 lists the *ex ante* and verified annual gross savings for the CY 2019 Retail Lighting and Appliance Program by measure type.

Table 123. CY 2019 Retail Lighting and Appliance Program First-Year Gross Savings
Summary by Measure Type

Measure	*Ex Ante* Gross First Year			Verified Gross First Year		
	kWh	kW	therms	kWh	kW	therms
Lighting	190,502,494	22,296	-	190,239,315	22,183	0
Non-Lighting	3,821,827	72	289,133	3,758,333	69	283,369
Total First Year	**194,324,321**	**22,369**	**289,133**	**193,997,647**	**22,252**	**283,369**

Table 124 lists the *ex ante* and verified annual gross savings for the CY 2019 Rural Pop-Up Events by measure type.

Table 124. CY 2019 Rural Pop-Up Events First-Year Gross Savings Summary by Measure Type

Measure	*Ex Ante* Gross First Year			Verified Gross First Year		
	kWh	kW	therms	kWh	kW	therms
Lighting	3,114,576	365	0	3,139,194	366	0
Non-Lighting	19,800	3	0	19,800	3	0
Total First Year	**3,134,376**	**367**	0	**3,158,994**	**369**	0

Table 125 lists the *ex ante* and verified gross lifecycle savings for the CY 2019 Retail Lighting and Appliance Program by measure type.

Table 125. CY 2019 Retail Lighting and Appliance Program Lifecycle Gross Savings Summary by Measure Type

Measure	*Ex Ante* Gross Lifecycle			Verified Gross Lifecycle		
	kWh	kW	therms	kWh	kW	therms
Lighting	3,051,469,162	22,296	0	3,046,543,639	22,183	0
Non-Lighting	38,538,204	72	3,235,896	37,877,007	69	3,162,593
Total Lifecycle	**3,090,007,366**	**22,369**	**3,235,896**	**3,084,420,646**	**22,252**	**3,162,593**

Table 126 lists the *ex ante* and verified gross lifecycle savings for the CY 2019 Rural Pop-Up Events by measure type.

Table 126. CY 2019 Rural Pop-Up Events Lifecycle Gross Savings Summary by Measure Type

Measure	*Ex Ante* Gross Lifecycle			Verified Gross Lifecycle		
	kWh	kW	therms	kWh	kW	Therms
Lighting	47,388,248	365	0	47,773,016	366	0
Non-Lighting	118,800	3	0	118,800	3	0
Total Lifecycle	**47,507,048**	**367**	0	**47,891,816**	**369**	0

Evaluation of Net Savings

This section details the Evaluation Team's methods for estimating the net Program savings.

Lighting

Following the lighting NTG approach from previous years, the Evaluation Team used a national lighting sales model to determine Program attribution for the Wisconsin efficient lighting market. The model quantified the relationship between Program intensity (Program spending per household) and efficient lighting sales (the percentage of light bulb purchases that are efficient). This section provides a high-level overview of the Team's analysis and findings. National sales data modeling findings are provided in more detail in *Appendix I. Net Savings Analysis*.

Data Sources

The Evaluation Team relied on a variety of data sources to develop the model but primarily on CY 2019 sales data prepared by the Consortium for Retail Energy Efficiency Data (CREED) LightTracker initiative.[67] Most of these sales data were generated from two sources—state point-of-sale data (representing one group of retail channels) and National Consumer Panel state sales data (representing a different group of retail channels)—that collectively represent the majority of bulb sales across the United States. The model also included inputs from a combination of Program data and household and demographic data from various publicly available websites, all collected by the Evaluation Team.

There were several primary model input data sources:

- National bulb sales
- Point-of-sale data (grocery, drug, dollar, discount, mass merchandiser, and selected club stores)
- Panel data (home improvement, hardware, online, and selected club stores)
- ENERGY STAR shipment data (imports and ENERGY STAR market share)
- North American Electrical Manufacturers Association shipment data
- American Community Survey data (household characteristics and demographic data)
- Retailer square footage per state (based on the two primary retailer channel data sources)
- General population surveys, lighting saturation studies, and other primary data collection made publicly available through evaluation reports

Modeling Methods

The primary goal of the model was to quantify the impact of state-level Program activity on the sales of efficient lighting. Several factors influence the sales of efficient lighting and, as noted above, the Evaluation Team considered a number of demographic and household characteristics, as well as retail channel variables, to capture and control for the unique characteristics of each state that could affect the uptake of efficient lighting products.

Using the regression model results, efficient bulb sales data, and Program tracking databases, the Evaluation Team estimated NTG ratios for all LEDs in CY 2019. The Team derived a NTG ratio by first using the model to predict the share of efficient bulbs with and without a Program (determining the

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[67] The Consortium for Retail Energy Efficiency Data (CREED) is a consortium of program administrators, retailers, and manufacturers that collect the necessary data to better plan and evaluate energy efficiency programs. LightTracker, CREED's first initiative, focused on acquiring full-category lighting data—including incandescent, halogen, CFL, and LED bulb types—for all distribution channels in the United States. As a consortium, CREED speaks as one voice for program administrators nationwide as they request, collect, and report on the sales data needed by the energy efficiency community. More details are available online: https://www.creedlighttracker.com.
The information contained herein is based in part on data reported by IRI through its Advantage service, interpreted solely by LightTracker. Any opinions expressed herein reflect the judgement of LightTracker, Inc. and are subject to change. IRI disclaims liability of any kind arising from the use of this information.

counterfactual of no Program activity by setting the Program variable to zero). This change in share represents the Program lift, or net increase in the share of efficient bulbs resulting from Program activity.

To then calculate NTG, the Team multiplied the change in share by the total number of bulbs—for all bulb types—sold in CY 2019. This value represents the net Program impact (that is, the total lift in the number of efficient bulbs sold), which the Team then divided by the total number of Program bulbs sold (the gross number of bulbs) to determine NTG:

$$NTG = \frac{(\#\ bulbs\ sold\ with\ Program - \#\ bulbs\ sold\ with\ no\ Program)}{\#\ of\ Program\ bulbs\ sold}$$

Results

As shown in Table 127, the estimated CY 2019 NTG modeled ratio for LEDs is 29.5%. This estimate considers current Program spending and current Program age; it does not include market effects (see

Market Effects section below).

The Evaluation Team applied the NTG ratio that does not account for market effects (29.5%) to CY 2019 results. Adding market effects at the end of the quadrennium will result in a final quadrennium NTG ratio that is higher than the CY 2019 ratio.

Table 127. LED Net-to-Gross Calculations

Calculation Term	Value
Total (All technologies) Wisconsin Bulbs 2019 (A)	24,795,586
Program $ per HH Actual (B)	$4.26
Program $ per HH Counterfactual (C)	$0.00
Program Age Actual (D)	17
Program Age Counterfactual (E)	16
LED Market Share Counterfactual (F)	60.2%
LED Market Share Modeled (G)	66.9%
LED Qty Counterfactual (H= A*F)	14,937,640
LED Qty Modeled (I=A*G)	16,594,042
Net LEDs Modeled (J=I-H)	1,656,402
Program Bulbs 2019 (K)	5,621,136
NTGR Modeled (L=J/K)	**29.5%**

Advanced Power Strips and Smart Thermostats

The Evaluation Team applied results from CY 2018 participant surveys to assess net savings for advanced power strips and smart thermostats. The survey's self-report NTG battery included questions that allowed the Evaluation Team to calculate freeridership (measures that would have been purchased in absence of the Program) and spillover (Program-induced energy-saving actions).

To calculate the measures' final NTG ratios, the Evaluation Team then combined self-reported freeridership and spillover results using the following equation. *Appendix I* provides a complete review of the Team's self-report NTG analysis and findings.

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

Table 128 shows CY 2018 freeridership and spillover results for advanced power strips and smart thermostats, as well as the measures' final NTGs. The Team applied these results to CY 2019 Retail Lighting and Appliance Program and Rural Pop-Up Events measures.

Table 128. CY 2018 Advanced Power Strip and Smart Thermostat NTG Results Applied to CY 2019 Savings

Measure	Freeridership	Spillover	NTG (1 – Freeridership + Spillover)
Advanced Power Strip	30%	2%	72%
Smart Thermostats	32%	11%	79%

Low-E Storm Windows

To calculate NTG for low-E storm windows, the Evaluation Team compared market shares in 2018 and 2019 between Minnesota and Wisconsin within participating retail stores, shown in Table 129. The same retailers operating in Minnesota and Wisconsin stocked similar products but Minnesota stores did not participate in the Program and therefore serve as a control group.

Table 129. Change Market Share of Low-E Windows by State

Year	Low-E Market Share	
	Minnesota	Wisconsin
2018	40%	48%
2019	37%	62%
Change	-3%	14%
Net Increase in Market Share		17%

Comparing market share in Wisconsin against Minnesota allowed the Team to account for naturally occurring changes for low-E storm windows. The difference between naturally occurring (Minnesota) and Program-induced (Wisconsin) market share determined the measure's NTG ratio. Looking at overall market share of all qualified low-E storm windows accounts for additional sales not directly discounted by the Program (e.g., if the Program increases the prevalence of qualified windows on retailer shelves).

Therefore, the NTG ratio inherently accounts for both spillover (increased overall market share) and freeridership (expected market share absent the Program), which self-report NTG analyses that look at only a sample of program participants would calculate separately.

The NTG ratio was calculated as follows:

$$NTG\ ratio = \frac{\Delta Market\ Share_{WI} - \Delta Market\ Share_{MN}}{Market\ Share_{WI\ 2019}}$$

This yielded an overall NTG estimate of 27% for the Program.[68] This NTG is lower than many other measures because of the Program's midstream design for this measure. This approach automatically results in a NTG lower than 100% since the retailers would have sold some of these low-E storm windows in the absence of the Program and NTG accounts for only the increase in market share beyond what would be expected absent the Program. An NTG of 27% represents a 38% increase in low-E storm window sales due to the Program.

CY 2019 Verified Net Savings Results

Table 130 shows the annual net demand and energy impacts (kWh, kW, and therms) by measure category for the Retail Lighting and Appliance Program. The Evaluation Team attributed these savings as net of what would have occurred naturally without the presence of the Program.

Table 130. CY 2019 Retail Lighting and Appliance Program Annual Net Savings

Measure	First-Year Net		
	kWh	kW	therms
Lighting	56,120,598	6,544	0
Non-Lighting	2,934,424	23	206,759
Total First Year	**59,055,022**	**6,567**	**206,759**

Table 131 shows the annual net demand and energy impacts (kWh, kW, and therms) by measure category for the Rural Pop-Up Events. The Evaluation Team attributed these savings as net of what would have occurred naturally without the presence of this effort.

Table 131. CY 2019 Rural Pop-Up Events Annual Net Savings

Measure	First-Year Net		
	kWh	kW	therms
Lighting	926,062	108	0
Non-Lighting	14,256	2	0
Total First Year	**940,318**	**110**	**0**

Table 132 lists the lifecycle net demand and energy impacts (kWh, kW, and therms) by measure category for the Retail Lighting and Appliance Program.

[68] Net change of 17% divided by 62% market share in 2019 equals 27%.

Table 132. CY 2019 Retail Lighting and Appliance Program Lifecycle Net Savings

Measure	Lifecycle Net		
	kWh	kW	therms
Lighting	898,730,374	6,544	0
Non-Lighting	29,298,000	23	2,156,394
Total Lifecycle	**928,028,373**	**6,567**	**2,156,394**

Table 133 lists the lifecycle net demand and energy impacts (kWh, kW, and therms) by measure category for the Rural Pop-Up Events.

Table 133. CY 2019 Rural Pop-Up Events Lifecycle Net Savings

Measure	Lifecycle Net		
	kWh	kW	therms
Lighting	14,093,040	108	0
Non-Lighting	85,536	2	0
Total Lifecycle	**14,178,576**	**110**	**0**

Market Effects

As in past evaluations, the Evaluation Team continued calculating longer-term market effects for the Program using the same national sales data model it uses to calculate annual NTG. By adjusting Program age in the NTG model, the Team is able to calculate the Program impact on the market considering current and past Program influence. Following guidance from the Evaluation Working Group, the Evaluation Team will calculate market effects annually throughout the quadrennium but will apply results cumulatively at the end of the quadrennium.

Focus on Energy uses Program incentives and marketing to impact customer awareness and demand for energy-efficient lighting as well as retailer stocking and promotion of efficient lighting. Therefore, Program age can be thought of as a proxy for these effects, measuring long-term trends due to multiple years of running programs. These effects should reflect positively, rather than negatively, in the NTG estimate.

Table 134 shows the CY 2019 NTG using current Program spending and setting the Program age counterfactual to zero. CY 2019 market effects is the difference between NTG with past Program influence (69.5%) and NTG with current Program influence (29.5%), or 40.0%.

Table 134. CY 2019 LED Net-to-Gross Calculations with Past Influence

Calculation Term	Current and Past Influence (With Market Effects)	Current Program Spending and Age Influence (Without Market Effects)
Total (All technologies) Wisconsin Bulbs 2019 (A)	24,795,586	24,795,586
Program $ per HH Actual (B)	$4.26	$4.26
Program $ per HH Counterfactual (C)	$0.00	$0.00
Program Age Actual (D)	17	17
Program Age Counterfactual (E)	0	16
LED Market Share Counterfactual (F)	51.2%	60.2%
LED Market Share Modeled (G)	66.9%	66.9%
LED Qty Counterfactual (H= A*F)	12,688,945	14,937,640
LED Qty Modeled (I=A*G)	16,594,042	16,594,042
Net LEDs Modeled (J=I-H)	3,905,097	1,656,402
Program Bulbs 2019 (K)	5,621,136	5,621,136
NTGR Modeled (L=J/K)	**69.5%**	**29.5%**

Process Evaluation

The Evaluation Team focused the process evaluation on the following key topics:

- Changes to program design and delivery, including new emphasis on Rural Pop-Up Events
- Changes to market barriers and solutions over time
- Changes in retailer and manufacturer relationships
- Changes to marketing strategy or customer engagement

Program Design, Delivery, and Goals

The goal of the Retail Lighting and Appliance Program is to overcome customer barriers related to product cost and lack of information about energy efficiency in order to increase the awareness and use of energy-efficient products. In CY 2019, the program continued to pursue this objective by offering rebates for LEDs, smart thermostats, advanced power strips, and low-E storm windows.

Customers could access downstream (after purchase) rebates for smart thermostats or purchase any of the eligible products (including smart thermostats) with a point-of-sale discount from a participating retailer or manufacturer. Program partners used brick-and-mortar retail chains, independent hardware stores, pop-up retail, and manufacturer websites to market and sell Program-rebated products.

Table 135 shows the products discounted through the Retail Lighting and Appliance Program in CY 2019, by retail channel and type of discount.

In addition, the Program Implementer conducts various marketing activities, including in-store promotions, and provides training and support to retail staff. The Program Implementer also works with Focus on Energy and the Program pop-up retailer to provide general information about a wider variety of efficient products and information on other Focus on Energy programs.

Table 135. Retail Lighting and Appliance Program Products by Incentive Type and Retail Channel

Product	Incentive Type/Retail Channel			
	Point-of-Sale Discount/Brick and Mortar Stores	Point-of-Sale Discount/ Pop-Up Retail Events	Point-of-Sale (Instant) Discount/ Manufacturer Websites	Downstream Rebate/ Any Retail Location
LEDs	✓	✓	✓	--
Smart Thermostats	--	--	✓	✓
Advanced Power Strips	--	✓	--	--
Low-E Storm Windows	✓	--	--	--

Program Management and Delivery Structure

To implement the Retail Lighting and Appliance Program, the Program Implementer works with manufacturers and other vendor partners to select qualified measures, establish target retail prices and sales volumes, and set promotional timelines. These Program partnerships are managed under memorandums of understanding (MOUs) between each partner and the Program Implementer. These MOUs set product-specific incentive amounts, catalogue stock-keeping unit numbers for rebated products, and list agreed-upon base retail prices for products.

In CY 2019, the Program Implementer negotiated multiple MOUs for LEDs. The majority of Program LED sales occurred at big box retail stores in urban and suburban areas. To reach rural customers, the Program Implementer also signed agreements to sell LEDs with a manufacturer operating through a discount retail chain that has a strong rural presence and with a manufacturer that partnered with independent retailers, such as small hardware stores.

In addition to the primary brick-and-mortar retail channels, the Program continued to offer LED and advanced power strip measures through pop-up retail events. These events were managed by a single retail partner that specializes in this type of sales approach. The standard pop-up retail events followed the same model as in previous years and typically occurred at a large employer or campus. The retailer coordinated the event with the host organization ahead of time then promoted that the trailer would be present on site for a limited time—usually a few days—and would offer energy-efficient products at a discount.

In previous years, the pop-up retail events were offered throughout all eligible Focus on Energy territories but tended to be concentrated in non-rural zip codes. For CY 2019, the Program made a more structured effort to offer pop-up events to a greater number of rural sites (in addition to continuing the standard events in non-rural areas), using funding from the rural initiative. This effort, referred to as Rural Pop-Up Events, is described in more detail in the next section, *Program Changes*.

In CY 2019, the Program worked with a single manufacturer to offer incentives for low-E storm windows. In the beginning of the year, this manufacturer partnered with three large do-it-yourself (DIY) retail chains to offer the point-of-sale discounts. However, early in the year, two of the chains dropped out due to low sales.

For smart thermostats, the Program partnered with two manufacturers in CY 2019 to offer instant discounts for eligible models sold through the manufacturers' websites. However, due to internal corporate issues, one company stopped participating with the Program in July 2019.

Across all measures, manufacturers sent invoices to the Program Implementer on a weekly, biweekly, or monthly basis (depending on the MOU). Invoice data including the number of products sold, the retailer that sold the product, and the retailer's point-of-sale data was directly uploaded to the Program database. The Program Implementer reviewed data against supporting documentation and MOU requirements and approved the data as part of the invoice payment process.

Program Changes

The Evaluation Team interviewed key Program Administrator and Program Implementer staff to obtain an overview of the Program's design and delivery processes and to identify any associated changes or challenges.

In general, the Program in CY 2019 was similar to CY 2018 to support a smooth transition between the CY 2014-CY 2018 quadrennium and the CY 2019-CY 2022 quadrennium. However, the Program Administrator and the Program Implementer reported a few changes to available product models, incentive levels, and delivery channels.

Eligible Products

In CY 2019, in parallel with the extension of the pop-up retail channel to rural areas, the Program added an LED kit to the mix of products available through the pop-up retail events. The kit, which sold for $10, included 10 LEDs plus an LED nightlight. Participants could also still purchase individual bulbs or advanced power strips through the pop-up retail events. The Program sold 8,626 kits in CY 2019 across both standard and rural pop-ups, equal to about 71% of all LEDs sold through the pop-up events.

In CY 2019, the Program Implementer also updated the definition of eligibility for low-E storm windows. ENERGY STAR introduced certification for low-E storm windows in the fall of 2018. Effective the second quarter of CY 2019, the Program adopted ENERGY STAR certification as the eligibility standard, replacing the previous technical requirements. According to the Program Implementer, this change had little impact on the products eligible for the discount since the manufacturer had pursued certification for a number of products; nevertheless, this change did simplify marketing and invoicing of this measure.

The Program Implementer is closely watching the market share of ENERGY STAR low-E models compared to non-ENERGY STAR models to ensure there is no erosion of savings if ENERGY STAR models become a dominant option. Sales data for Wisconsin (where incentives were available) indicate that market share for ENERGY STAR storm windows was 62% in 2019. This was an increase of 14% over the market share the previous year and higher than the market share in Minnesota, where no incentives were available. (See the *Low-E Storm Windows* section above for a more detailed discussion.)

The Program Implementer reported that it is considering some new measures for the Program, such as thermostats for electric baseboards. No new measures were launched in CY 2019, since the Program Implementer is still reviewing the feasibility of possible additions.

Incentive Levels

Based on a review of the CY 2018 recommendation and other inputs, the Program Implementer reduced the incentive for smart thermostats from $75 per unit to $50 per unit, as of July 1, 2019. At the time of the interview (September 2019), the Program Administrator said there had been no noticeable drop in participation and that the reduction brought the Program incentive more in line with other states.

Final tracking data show that the Program processed 22% fewer smart thermostat incentives in CY 2019 compared to CY 2018 (8,621 compared to 11,074). Though the change in the incentive may have been a contributing factor, other factors likely also played a role. First, one manufacturer partner ended its Program participation in June and therefore sold about 1,200 fewer units through the Program than in CY 2018 (discussed in more detail in the next section). In addition, the Online Marketplace launched in September 2019 and sold just over 1,500 smart thermostats. Though the Online Marketplace operates through a different model, those sales likely include some market shift from the Retail Lighting and Appliance Program.

Delivery Channels

The Program Implementer reported that the Program was able to maintain over 1,000 active retail locations throughout most of the CY 2019. In addition, the Program Implementer experimented on a small scale with LED sales through nonprofits and other organizations. The Program Implementer said this effort was limited in CY 2019 and was put on hold while it reviewed information on Program attribution, installation in nonresidential applications, and other factors.

In CY 2019, Focus on Energy launched the Online Marketplace, a separate program that offered point-of-sale discounts on smart thermostats, LEDs, advanced power strips and water-saving measures. To create space for this new program, the Retail Lighting and Appliance Program put less emphasis on instant discounts on smart thermostat manufacturer websites. The Program Implementer said it expects that the two programs will bolster each other through cross-marketing and more varied purchase options, but also that it continues to monitor customer response to the Online Marketplace to make sure no issues are created due to possible overlap. To better coordinate across the two channels (standard retail and the online marketplace), the Program Administrator may combine them into the same program in 2020.

Also important, one participating thermostat manufacturer stopped offering the instant discount for smart thermostat purchases on its website after June 2019. That manufacturer had sold 2,594 program-discounted units in CY 2018, compared to 1,225 in CY 2019. Given sales in the first part of CY 2019, the manufacturer was likely on track to make as many sales in CY 2019 as in CY 2018 had it continued with the instant discount.

Rural Pop-Up Events

In CY 2019, Focus on Energy used rural initiative funding to extend pop-up retail events to a greater number of rural locations. Rural pop-ups offered the same measures as standard pop-ups, including single LEDs, the LED kit including 10 bulbs and a nightlight for $10, and advanced power strips, but were managed somewhat differently than standard pop-up events. Given that there were few large

employers or campuses in rural areas, the Program Implementer worked with the local utility or other local representative to locate events at smaller employers, smaller community events, local stores or schools, or other alternate sites. In addition, the Rural Pop-Up Events offered bulb trade-ins for incandescent and halogen bulbs, while standard pop-ups typically did not. The turn-in component allowed customers to receive one free LED for each of up to 12 halogen or incandescent bulbs exchanged.

The Program Implementer reported that even with relaxed criteria for siting events, it was more challenging to identify appropriate sites in rural areas. However, the Implementer also found that the local utilities and other partners supporting the events viewed them as a valuable marketing and customer engagement tool. In CY 2019, there were 50 unique rural pop-up events, compared to 51 unique standard events. The 101 unique pop-up events in CY 2019 exceeded the 85 events in CY 2018 (including a small percentage of rural events that were not tracked separately). The number of rural events achieved the target of 45 to 50 rural events documented in the Retail Lighting and Appliances CY 2019 Operating Manual.

Table 136 shows the total sales of LEDs and advanced power strips through both rural and standard pop-ups in CY 2019. The Rural Pop-Up Events accounted for 54% of LED pop-up sales and 22% of advanced power strip pop-up sales. LED sales may have been higher in rural events compared to standard events due to the bulb trade-in component that was primarily offered through the rural pop-ups. (This table does not include 24,426 LEDs that were sold in CY 2018 pop-ups but not reported until CY 2019.)

Table 136. Pop-Up Event Sales in CY 2019

Pop-Up Model	Kits Bulbs	Turn-in Bulbs	Other Bulbs	Total Bulbs	Total Bulbs (%)	Total Adv. Power Strips	Total Adv. Power Strips (%)
Rural	40,040	17,565	28,145	85,750	54%	360	22%
Standard	46,220	24,852	1,662	72,734	46%	1,268	78%
Total	**86,260**	**42,417**	**29,807**	**158,484**		**1,628**	

Program Goals

The Program's overall objective is to encourage residential customers to use more energy-efficient products. For CY 2019, Focus on Energy set savings goals for both the core Retail Lighting and Appliance Program and the Rural Pop-Up Events, as shown in Table 137.[69]

Table 137. CY 2019 Goals for Residential Lighting and Appliance Program

Program	Lifecycle			
	kW	kWh	Therm	MMBtu
Retail Lighting and Appliance	23,443	3,194,383,884	4,137,016	11,312,939
Residential Pop-Up at Large Employers (Rural Pop-Up Events)	997	117,237,093	0	400,012

[69] Metrics presented in this section represent Focus on Energy's targets for the Program and not contractual goals for the Program Implementer. The Program Implementer is required to meet a gross lifecycle MMBtu goal in addition to fuel-specific savings targets.

In CY 2019, neither the core program nor Rural Pop-Up Events met their electric savings and demand goals or gas saving goals due to participation that was lower than anticipated.

The Program Administrator said it was also monitoring application processing time, number of active retail locations, and retailer diversity. In addition, the Program Administrator challenged the Program Implementer to balance out savings over the course of the year.

The Program Implementer said it was well below previous key performance indicators (KPIs) for application processing time. The Program Implementer also reported that, though the Program had about the same number of participating locations in CY 2019 as the previous year (over 1,000), CY 2019 benefitted because all of these locations were already participating in the beginning of the year, instead of having to be built up over time.

This allowed the Program to achieve greater savings earlier in the year and be more flexible in terms of managing savings targets. Because lighting is a seasonal product and has historically dominated savings from the Retail Lighting and Appliance Program, the majority of savings have typically occurred in the fall. In CY 2019, the Program Implementer said the Program was about 10% closer to its annual savings goal by July compared to the same month in prior years. The Program Implementer said it had accomplished the early lift by increasing in the MOU budget in the first half of the year, taking advantage of the increased number of locations, and offering higher discounts. A more intensive focus on smart thermostats marketing also contributed to the early program savings.

Marketing and Outreach

As with the rest of the Program design, the marketing approach in CY 2019 was largely the same as in CY 2018. The Program Implementer reported that in-store materials and online ads for LEDs and smart thermostats were rebranded and updated during the year, although content was largely unchanged. The Program Implementer continues to work with the same subcontractor to get materials into stores and with manufacturers and store managers to optimize product location. For example, in CY 2019, the subcontractor was focused on placing eligible products in “Smart Home” displays in some stores.

In CY 2019, one challenge the Program Implementer reported was finding enough suitable locations for pop-up retail events, especially in rural areas. The Implementer was experimenting with marketing to drive attendance at the events, particularly through social media campaigns. The Implementer also offered bulb exchanges at select pop-up events (mostly in rural areas).

The Program Implementer said it was continuing to refine its strategy for siting pop-up retail events, especially as the Program put more focus on rural locations. The Implementer collected participant and partner feedback from every event. It also observed that taking advantage of an event that already focused on sustainability resulted in much higher attendance and participation.

For example, a pop-up at the Tall Ships Event in Green Bay was less successful than the event at the Renewable Energy Fair. The staff of the Renewable Energy Fair were also more aware of and attentive to the needs of the pop-up, including sending out a notice the day before to remind people to bring incandescent bulbs for trade.

The Program Implementer also reported that some utilities had requested pop-up events in their area to coincide with existing utility-sponsored activities, such as open-house or similar events. According to the Program Implementer, utilities were very happy with the extra marketing and attention that the pop-up events provided.

Customer Experience

The Evaluation Team did not conduct annual participant surveys for the Retail Lighting and Appliance Program in CY 2019. The Team did conduct ongoing participant satisfaction surveys over CY 2019. These surveys also found continuing high levels of satisfaction.

Annual Results from Ongoing Participant Satisfaction Survey

The Evaluation Team surveyed Retail Lighting and Appliance Program participants in CY 2019 to measure their satisfaction with three Program components:

- Retail smart thermostats
- Online coupon smart thermostats
- Pop-up retail (including both standard pop-ups and Rural Pop-up Events)

Respondents answered questions related to satisfaction and likelihood on a scale of 0 to 10, where 10 indicated the highest satisfaction or likelihood and 0 indicated the lowest.

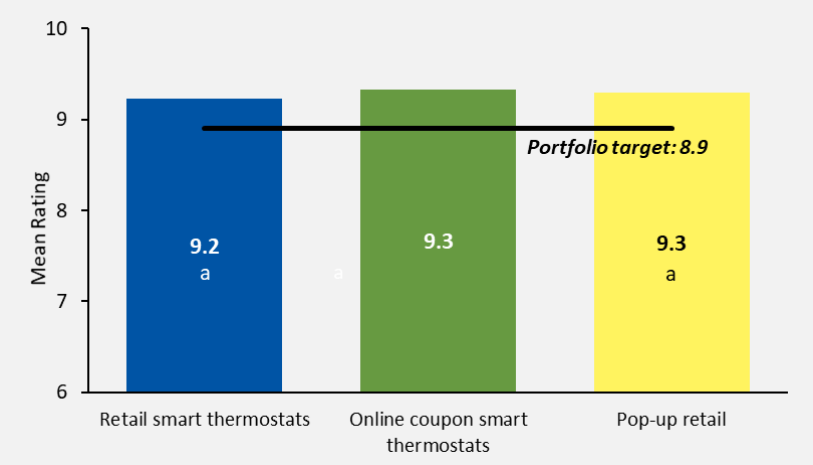
Customer Satisfaction with Program Components

Figure 81 shows the overall satisfaction ratings from Retail Lighting and Appliance Program participants for the three Program components. The CY 2019 average satisfaction ratings for the retail smart thermostats (9.2) and pop-up retail (9.3) components were statistically higher than the portfolio target of 8.9 but statistically equivalent to ratings from CY 2018 participants (9.2 and 9.1, respectively).[70]

Satisfaction ratings for the online coupon smart thermostat component were comparable (9.3) but were statistically equivalent to the 8.9 portfolio target due to the small number of surveys (n=24).

[70] The Program Administrator's contract established a portfolio target of 8.9 to maintain or increase customer satisfaction.

Figure 81. CY 2019 Overall Satisfaction with Retail Lighting and Appliance Program Components



Source: Retail and Online Coupon Smart Thermostat Participant Satisfaction Survey Questions. "Overall, how satisfied are you with the Focus on Energy Program?" (retail smart thermostats n=804, online coupon smart thermostats n=24) and Pop-Up Retail Ongoing Participant Satisfaction Survey Question. "Overall, how satisfied are you with the Focus on Energy sale that you participated in?" (n=175)

[a] This result is statistically significantly different from the portfolio target (p<0.10 or better using binomial t-tests).

Table 138 shows the average satisfaction and likelihood ratings for the retail and online coupon smart thermostat Program components. In CY 2019, retail smart thermostat participants gave statistically lower ratings than they had in CY 2018 for likelihood of making more improvements (7.7, which was the same as the rating from CY 2017). CY 2018 was the first year that online coupon smart thermostat participants were surveyed, and their average ratings were comparable to retail smart thermostat participants. Online coupon participants also rated their satisfaction with the process of obtaining and redeeming the coupon incentive highly (9.7).

Table 138. CY 2019 Average Ratings for Retail and Nest Smart Thermostats

Item	CY 2018 Retail Smart Thermostats	CY 2019 Retail Smart Thermostats	CY 2019 Online Coupon Smart Thermostats
Satisfaction with obtaining and redeeming coupon	*Not applicable*		9.7
Likelihood of making more improvements	8.0	7.7 [a]	8.2
Likelihood of recommending the Program	9.6	9.5	9.5

[a] This result is statistically significantly different from the result for CY 2018 (p<0.05 using a binomial t-test).

Table 139 shows the average satisfaction and likelihood ratings for the pop-up retail component of the Program. In CY 2019, there were statistically significant improvements in ratings for the event purchase experience (9.3), likelihood of recommending the Program (9.4), and likelihood of making more improvements (8.3).

Table 139. CY 2019 Average Ratings for Pop-Up Retail Events

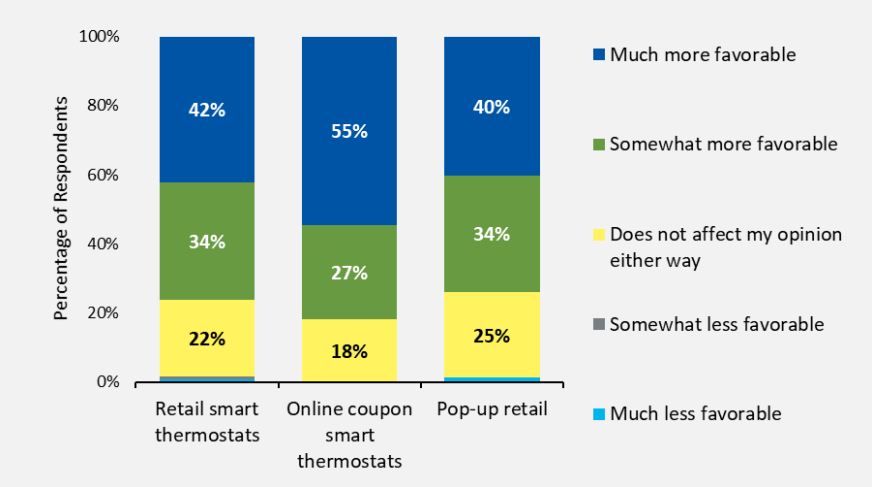
Item	CY 2018	CY 2019
Satisfaction with event purchase experience	9.0	9.3 [a]
Likelihood of making more improvements	7.2	8.3 [a]
Likelihood of recommending the Program	9.2	9.4 [a]

[a] This result is statistically significantly different from the result for CY 2018 (p<0.10 using a binomial t-test).

Using these survey data, the Evaluation Team calculated a Net Promotor Score (NPS) based on customers' likelihood to recommend the Program. The NPS is expressed as an absolute number between -100 and +100 that represents the difference between the percentage of promoters (respondents giving a rating of 9 or 10) and the percentage of detractors (respondents giving a rating of 0 to 6). The retail smart thermostats NPS was +87 in CY 2019, identical to CY 2018, while the NPS for online coupon smart thermostats was very similar at +88 in CY 2019. The pop-up retail NPS was +83 in CY 2019, increasing from +70 in CY 2018 which in turn represented an increase from +58 in CY 2017.

CY 2019 Retail Lighting and Appliance Program participants were asked if Focus on Energy offerings affected their opinion of their utilities, and for all three surveyed components at least 40% gave the highest rating of *much more favorable* (Figure 82). Just 25% or fewer said that their opinion was not affected, and only 2% of retail smart thermostat respondents (12 of 768) and 1% of pop-up retail respondents (2 of 157) reported that their opinion of their utility had become *somewhat less favorable* or *much less favorable*.

Figure 82. CY 2019 Effect of Focus on Energy Offerings on Participants' Opinion of Utilities



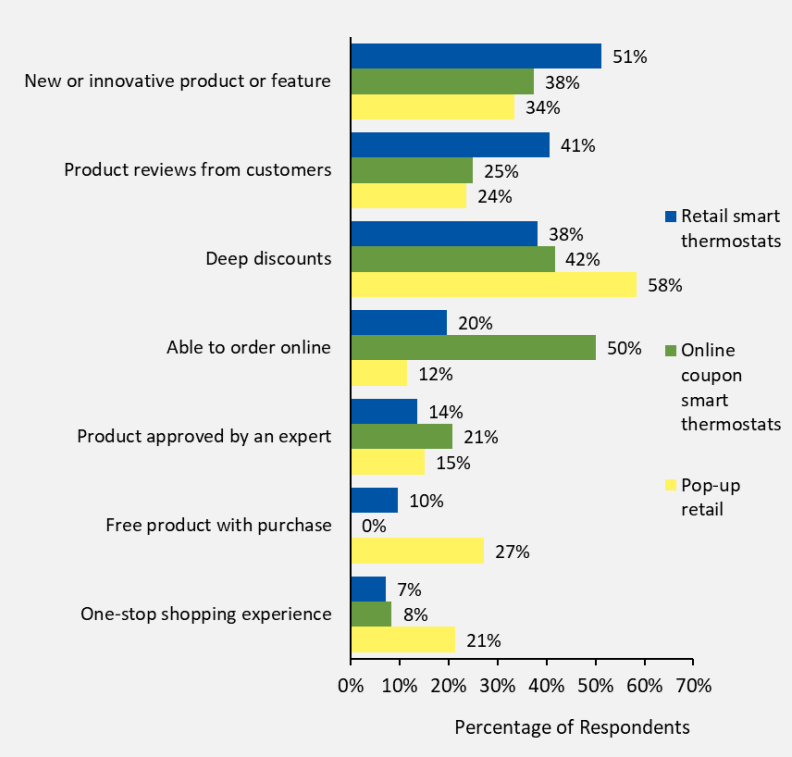
Source: Retail Lighting and Appliance Program Ongoing Participant Satisfaction Survey Question. "Your energy utility partners with Focus on Energy to offer energy efficiency programs to its customers. How have these offerings affected your opinion of your utility, if at all?" (retail smart thermostats n=768, online coupon smart thermostats n=22, pop-up retail n=157)

Purchase Decisions

Retail Lighting and Appliance Program participants identified the two factors they value most in making purchase decisions (Figure 83). The most mentioned factors for retail smart thermostat respondents were innovative product features (51%) and product reviews from other customers (41%), whereas for online coupon thermostat respondents the top factors were being able to order online (50%) and deep discounts (42%).

For pop-up retail respondents, the most mentioned factors were deep discounts (58%) and innovative product features (34%). Pop-up retail participants were also more likely than smart thermostat customers to mention free products with purchase (27%) and one-stop shopping (21%).

Figure 83. CY 2019 Participants' Most Valued Factors in Purchase Decisions

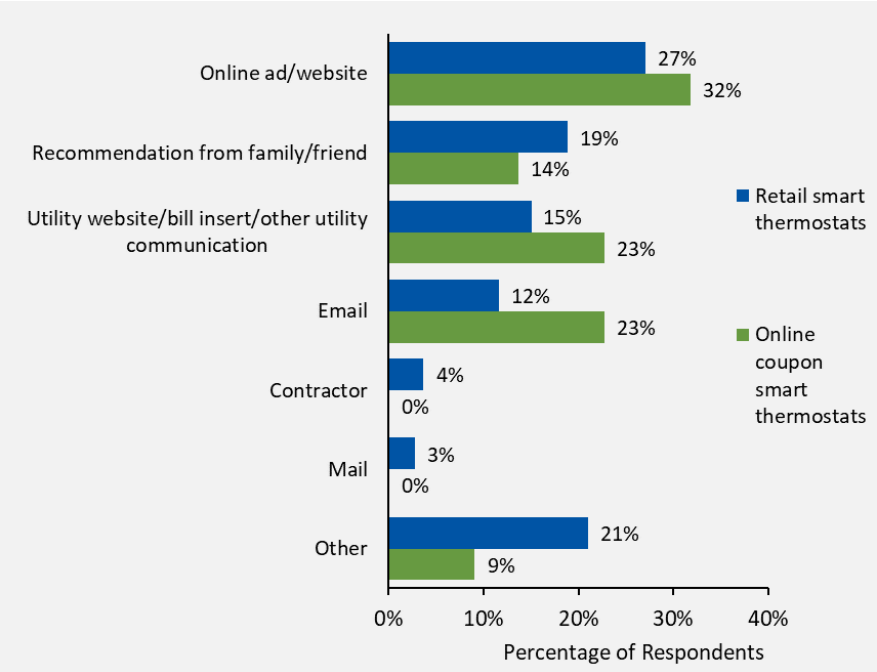


Source: Retail Lighting and Appliance Program Ongoing Participant Satisfaction Survey Question. "What do you value the most in making a purchase decision (energy efficiency or otherwise)? Choose your top two from the list below." (retail smart thermostats n=802, online coupon smart thermostats n=24, pop-up retail n=173)

Program Awareness

Retail and online coupon smart thermostat participants also answered how they learned about the program component they participated in (Figure 84). The most common source for both Program components was online advertising and websites (27% retail smart thermostats, 32% online coupon smart thermostats). Utility communications (23%) and email (23%) were the next most common for online coupon participants. Word-of-mouth recommendations (19%) and miscellaneous responses (21% "other") were the next most common for retail smart thermostat respondents. Most of these miscellaneous responses referred to in-store displays, retail employees, or retailer websites.

Figure 84. CY 2019 Retail and Online Coupon Smart Thermostat Participants' Source of Program Awareness



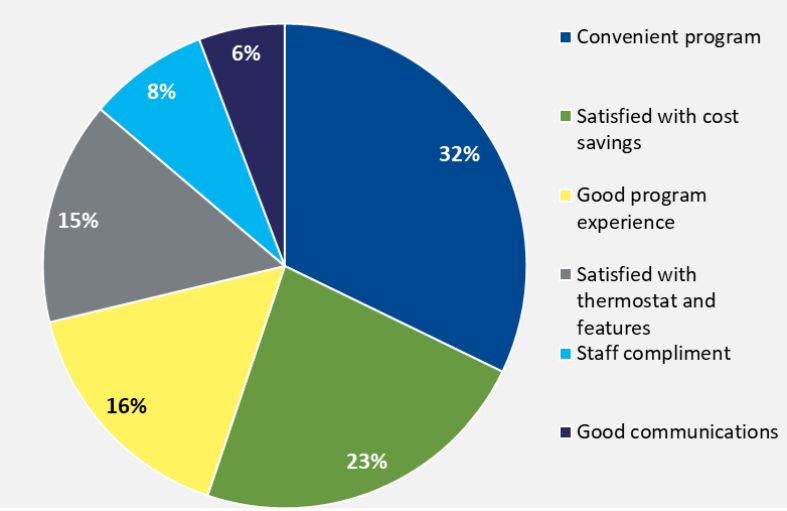
Source: Retail Lighting and Appliance Program Ongoing Participant Satisfaction Survey Question. "How did you learn about this particular opportunity from Focus on Energy?" (retail smart thermostats n=765, online coupon smart thermostats n=22)

Customer Suggestions for Improvement

During the ongoing participant satisfaction surveys, the Evaluation Team asked respondents if they had any comments or suggestions for improving the Program. Of the 807 participants who responded to the retail smart thermostat survey, 20% provided open-ended feedback, which the Evaluation Team coded into a total of 187 mentions. Of these mentions, 87 (47%) were positive or complimentary comments, and 100 (53%) were suggestions for improvement.

Positive comments about retail smart thermostats are shown in Figure 85. The most frequent positive comments were about the ease and convenience of the program (32%), which increased from CY 2018 (23%). The second most frequent category of comments reflected satisfaction with cost savings (23%), at a rate similar to last year (18%).

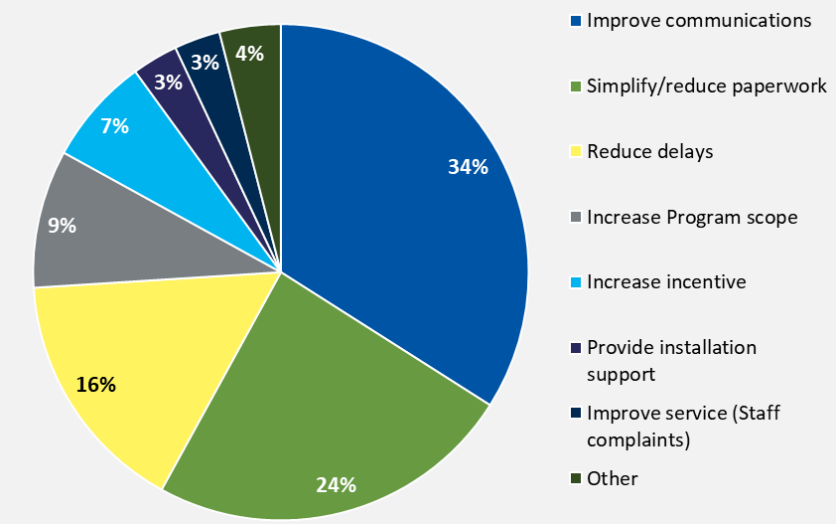
Figure 85. Positive Comments about CY 2019 Retail Smart Thermostat Component



Source: Retail Smart Thermostat Ongoing Participant Satisfaction Survey Question. "Please tell us more about your experience and any additional suggestions for improvement." (n=87 mentions)

Suggestions for improving the smart thermostat components of the Retail Lighting and Appliance Program are shown in Figure 86. Improving communications about the Program was the most common suggestion from retail smart thermostat participants (34%), which was also the most common suggestion in CY 2018 (32%). The second and third most frequent suggestions were to reduce or simplify the rebate paperwork (24%) and to reduce delays in approval and payment of rebates (16%), which were mentioned at similar rates in the same order CY 2018 (23% and 21%, respectively).

Figure 86. CY 2019 Suggestions for Improving Retail Smart Thermostat Component



Source: Retail Smart Thermostat Ongoing Participant Satisfaction Survey Question. "Please tell us more about your experience and any additional suggestions for improvement." (n=100 mentions)

Suggestions for improving communications included providing timelier and more informative follow-up on applications and customer inquiries, improving the navigability of the website, ensuring that any changes in program eligibility or rebate amounts are communicated clearly, and increasing awareness

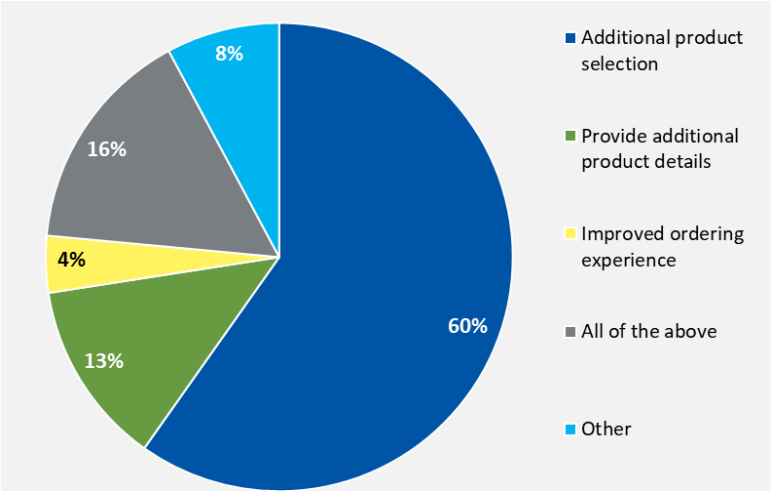
by marketing the rebate more widely. As in previous years, retail smart thermostat participants' suggestions about simplifying the rebate documentation frequently referred to difficulties uploading receipts to the website and to obtaining and submitting electronic proofs of purchase.

Of the 24 participants who responded to the online coupon smart thermostat survey, two provided open-ended feedback. One respondent was disappointed that the smart thermostat was not compatible with the home's heating and cooling systems, while the other was initially confused about whether the Program would send a coupon or require completion of a rebate form.

The Evaluation Team asked pop-up retail respondents how their experience could have been improved and offered a selection of response options. More than one-third (41%; n=162) selected the response option *nothing needed improvement*, similar to the rate from previous years. The remaining 96 respondents made 102 suggestions, shown in Figure 87.

Offering additional product selection was the most frequent suggestion in CY 2019 (60%), reflecting a steady increase from CY 2018 (49%) and CY 2017 (35%). Providing more detailed information about products has been the second most frequently mentioned suggestion every year since CY 2017.

Figure 87. CY 2019 Pop-Up Retail Customers' Suggestions for Improving the Event Experience

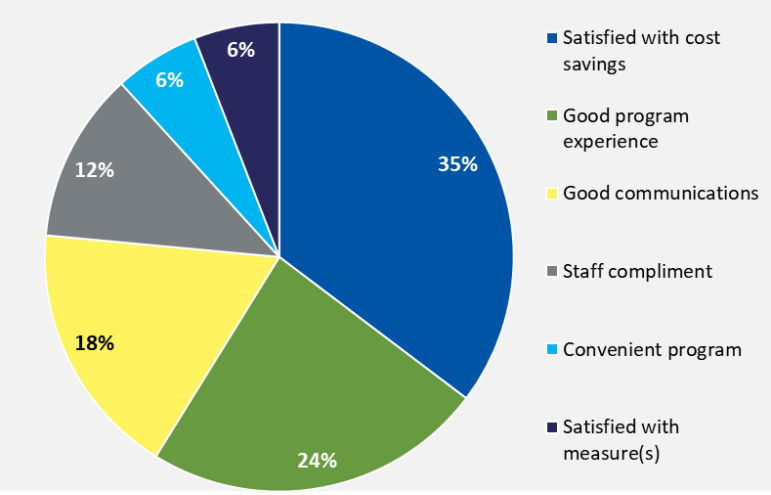


Source: Pop-Up Retail Ongoing Participant Satisfaction Survey Question. "How could the event experience have been improved for you?" (n=102 mentions)

Of the 175 participants who responded to the pop-up retail survey, 17% provided open-ended Program feedback, which the Evaluation Team coded into 36 total mentions. Of these mentions, 17 (47%) were positive or complimentary comments, and 19 (53%) were suggestions for improvement.

Positive comments about the pop-up retail event are shown in Figure 88, with most comments reflecting satisfaction with cost savings (35%) or a generally positive Program experience (24%).

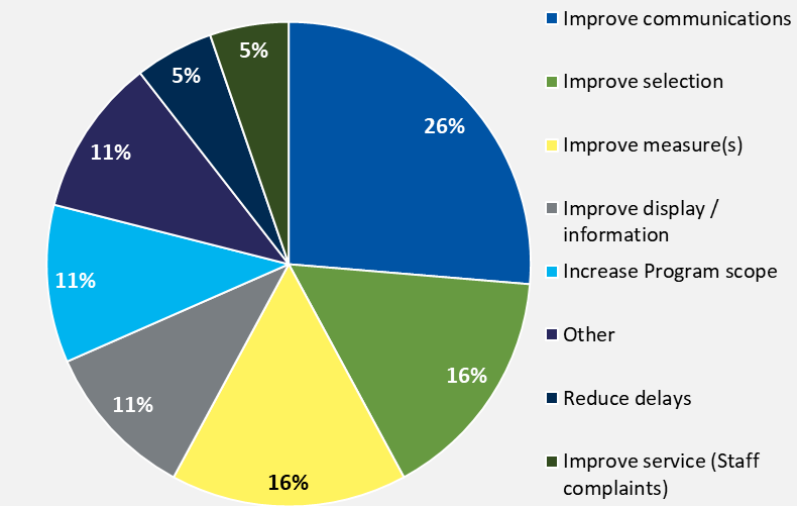
Figure 88. CY 2019 Positive Comments about Pop-Up Retail Event



Source: Pop-Up Retail Ongoing Participant Satisfaction Survey Question. "Please tell us more about your experience or any additional suggestions for improvement." (n=17 positive mentions)

Suggestions for improving pop-up retail events are shown in Figure 89. The most frequent suggestion was to improve the product communications (26%) followed by increasing the selection of items for sale (16%). These were also the top two suggestions in CY 2018. Suggestions for improving communications focused on providing more information prior to the event so that customers have a better idea what to expect in terms of product selection and the process for exchanging old lightbulbs. Suggestions for improving the selection focused on providing higher wattage LEDs and a wider selection of styles and color temperatures.

Figure 89. CY 2019 Suggestions for Improving Pop-Up Retail Event



Source: Pop-Up Retail Ongoing Participant Satisfaction Survey Question. "Please tell us more about your experience or any additional suggestions for improvement." (n=19 suggestions for improvement)

LED Market Share

Using the same national lighting sales data that the Evaluation Team used to calculate LED NTG (see *Evaluation of Net Savings* section above), the Team assessed some of the key factors driving LED market share specifically in Wisconsin.

Some of the key lighting program attributes the Evaluation Team developed were these:

- **Market share distribution.** LED market share distribution for the United States, Wisconsin vs. the U.S., as well as across each state and across retail channels.
- **Program intensity.** LED lighting market share relative to overall program expenditures per household.
- **Program incentives.** Average LED lighting program incentives per bulb.
- **ENERGY STAR market share distribution.** LED market share distribution in Wisconsin compared to states that do not run an upstream lighting program.

Figure 90 shows the national market share of the four bulb types (incandescent, halogen, CFL, and LED) across the past five years. LEDs continue to gain substantial market share, rising from 19% in 2015 to 60% in 2019. From 2015 to 2017, LEDs largely displaced sales of CFLs only. In 2018 and 2019, LEDs began to displace inefficient bulbs. Still, inefficient lighting (incandescent bulbs and halogens) represents almost 40% of the market. The dashed line identifies the market trend of efficient lighting compared to inefficient lighting, visualizing the relatively stable market share of efficient lighting through 2017 and how that market share began increasing in 2018.

Figure 90. Year-Over-Year Total U.S. Market Share by Lamp Type

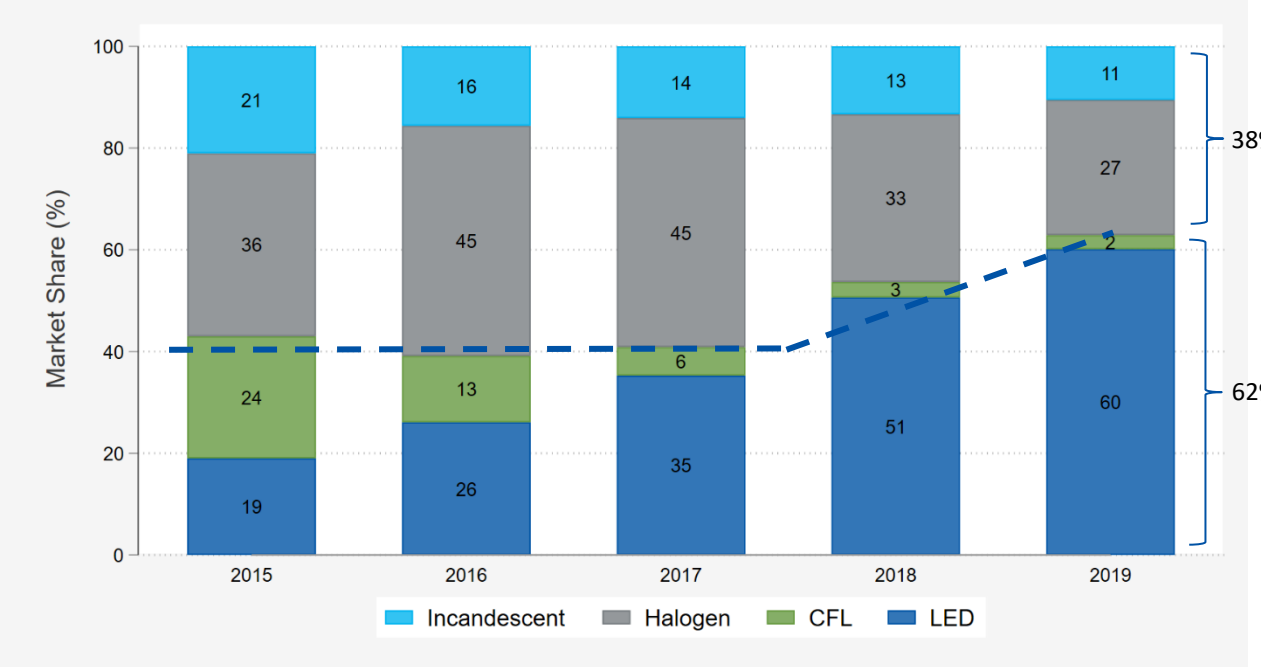


Figure 91 compares the data in Figure 90 to Wisconsin market shares. In terms of LED market share, Wisconsin distanced itself from the national market share in 2016. Since then, Wisconsin LED market share has consistently been greater than national market share. In 2019, LED market share in Wisconsin was nearly 14.5 percentage points greater (74.5%) than the national market share (60.1%).

Figure 91. Wisconsin and Total U.S. Year-Over-Year Market Share by Bulb Type

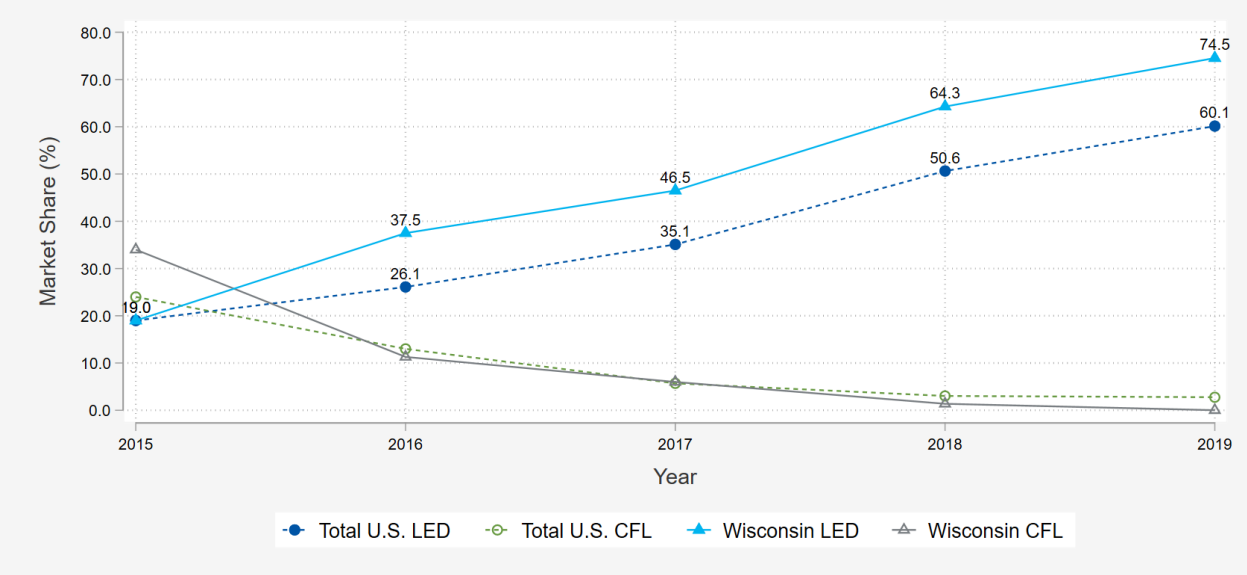
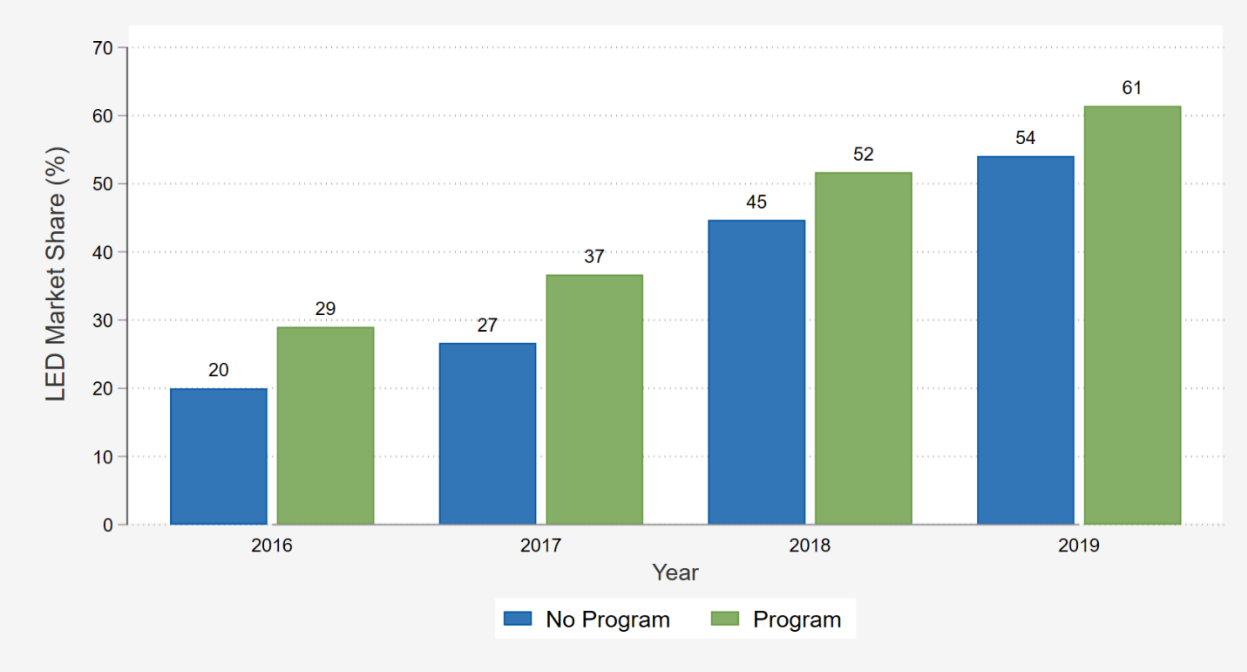


Figure 92 shows the state-level LED share as a function of program activity (program state or non-program state). It is important to note that the number of states in each bin varies by year. In 2019, there were 11 states in the no program bin and 33 states in the program moderate bin.[71]

[71] The "no program" states in 2019 are Alabama, Delaware, Kansas, Kentucky, Mississippi, Nebraska, Nevada, Tennessee, Utah, Virginia, and Wyoming. Note that Nevada ran an upstream lighting program through 2017.

Figure 92. Relationship Between Program Activity and LED Sales



There are two key takeaways from Figure 92. First, LED share is higher in program states, although the gap has decreased from about 10 percentage points in 2016 and 2017 to about seven percentage points in 2018 and 2019. Second, LED share in "no program" states typically lags LED share in program states by about one year (e.g., in 2018 the average LED market share was 52%, and in 2019 the no program states had an LED market share of about 54%).

Similarly, Figure 93 shows how LED sales in Wisconsin compare to the 42 modeled states. States highlighted in blue represent states with programs. Green bars represent states that did not offer a lighting program. There are a handful of program states with low LED market shares, but the overall trend is clear: states with programs generally have higher LED market shares.

Indeed, of the top 12 states in terms of LED market share, all have upstream lighting programs. Note that for most of the no program states, LED market share is below 60% (the national average). Also note that Nevada, one of the no program states that is above 60% LED market share (61%), ended programs in 2017.

Figure 93. LED Sales Distribution Across States (2019)

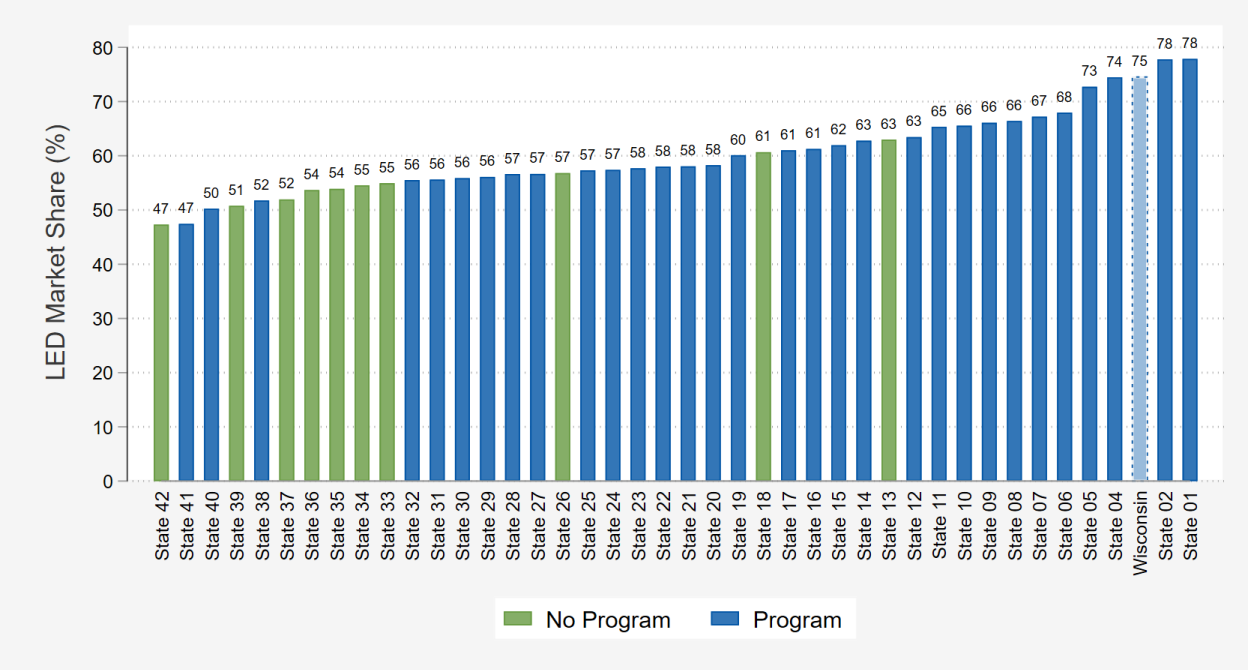
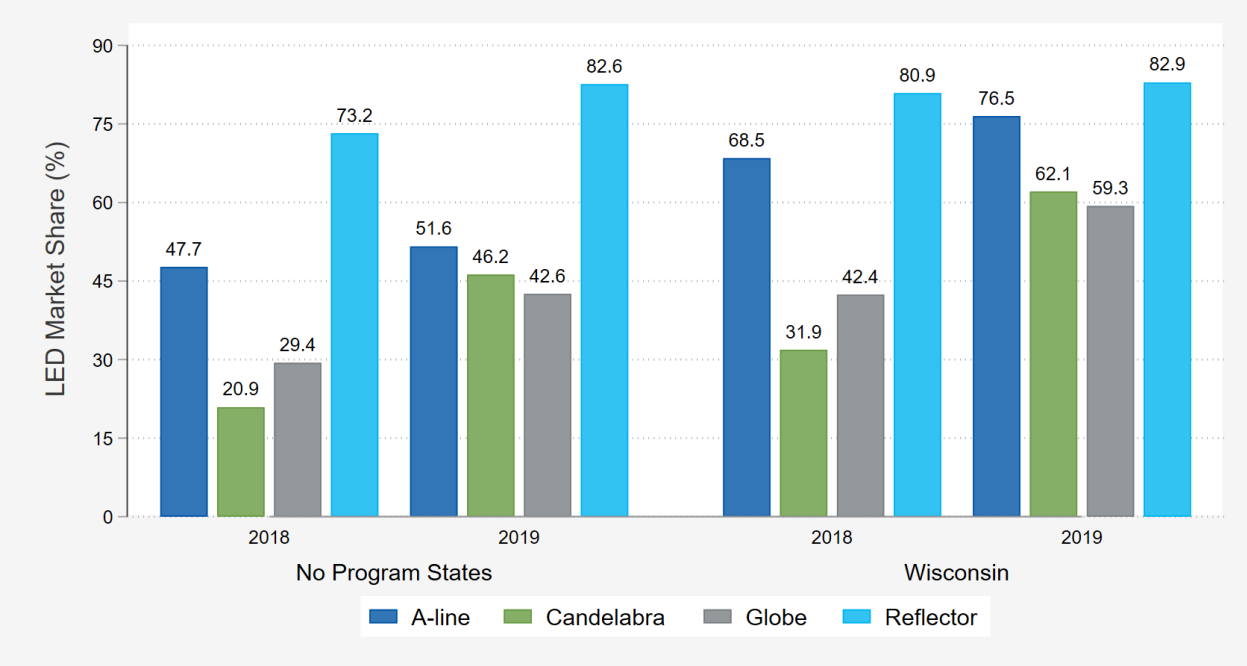


Figure 94 shows the LED market share by lamp style and by no program states and Wisconsin across 2018 and 2019. The market shares differ substantially by style, with LEDs representing a majority of A-line and reflector sales in 2019, even in states without programs (52% and 83%, respectively). Candelabras and globes had the smallest LED market share of all lamp styles.

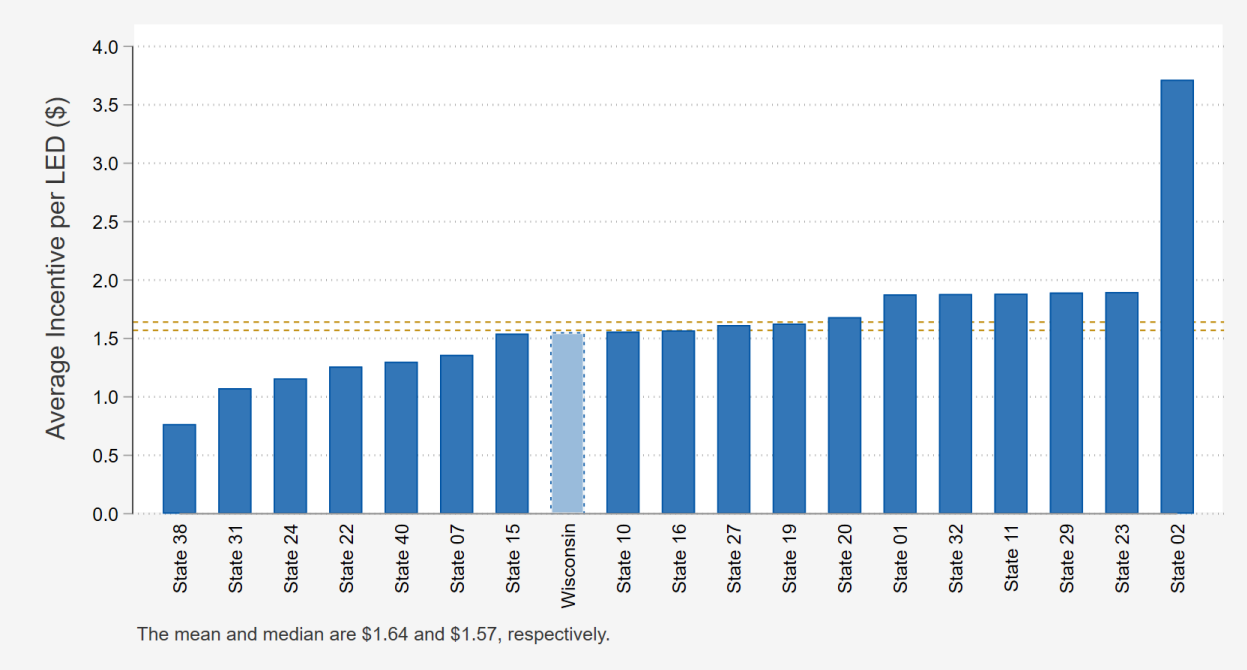
Figure 94. LED Market Share by Lamp Style (2018-2019)



In both years, LED market shares in Wisconsin exceed LED market shares in no program states, typically by several percentage points. For A-line lamps in particular, the LED market share in Wisconsin is more than 20 percentage points higher than the share in no program states in 2019. Reflectors are on the other end of the spectrum, where the 2019 LED market share in Wisconsin is only slightly greater than the market share in states without upstream lighting programs.

The Evaluation Team also compared the average incentive offered per LED across states in which LED incentive information was collected. A simple calculation of incentive dollars divided by bulb units yielded average incentives per state. As shown in Figure 95, in the 19 states that had sufficient data, LED incentives ranged from approximately $1 to $4 per LED bulb, with most of these states offering between $1.50 and $2 per LED. The mean and median LED incentive are $1.64 and $1.57, respectively. At $1.55 per LED, Wisconsin's incentive is just slightly below the average.

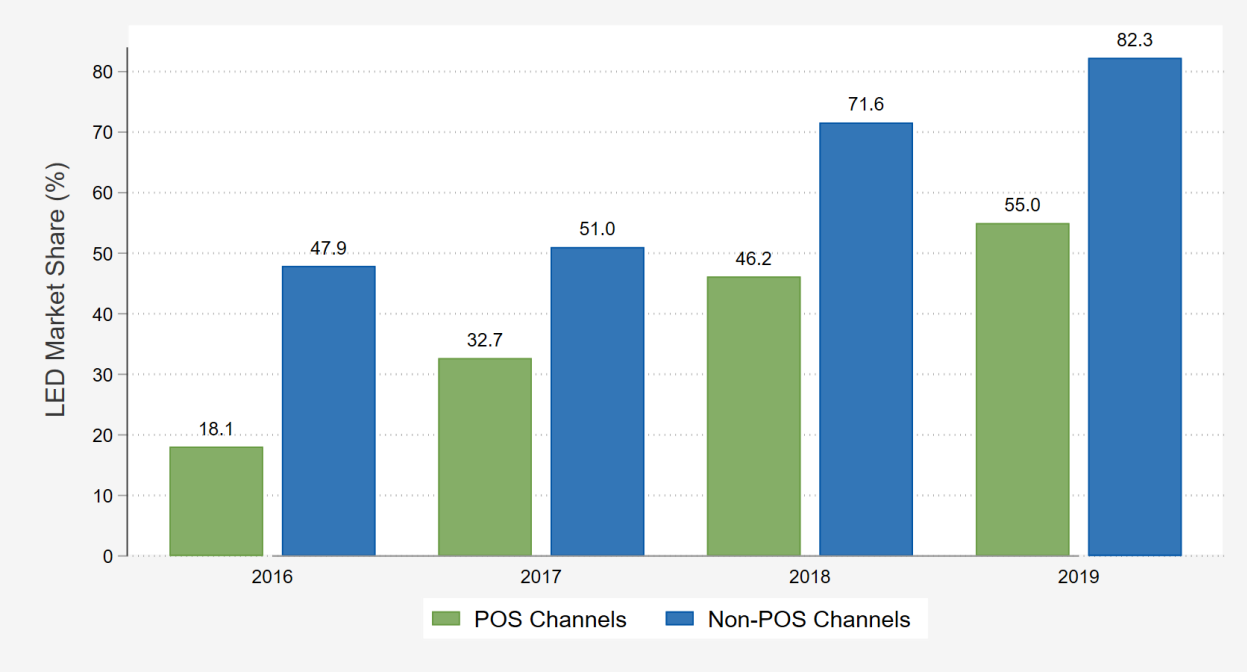
Figure 95. Average Upstream Lighting Incentive Per LED (2019)



Analysis of the sales data model showed that sales of LEDs had greater market share in the non-point-of-sale retail channels than the point-of-sale retail channels, as shown in Figure 96.[72] In 2019, more than 80% of the lighting purchases made in the non- point-of-sale channel were LEDs, compared to approximately half (55%) market share for LEDs in the point-of-sale channel. LED market share has increased in both retail channels since 2016.

[72] In total, approximately 80% of bulbs were purchased in the non-point-of-sale channels.

Figure 96. Wisconsin LED Market Share by Retail Channel

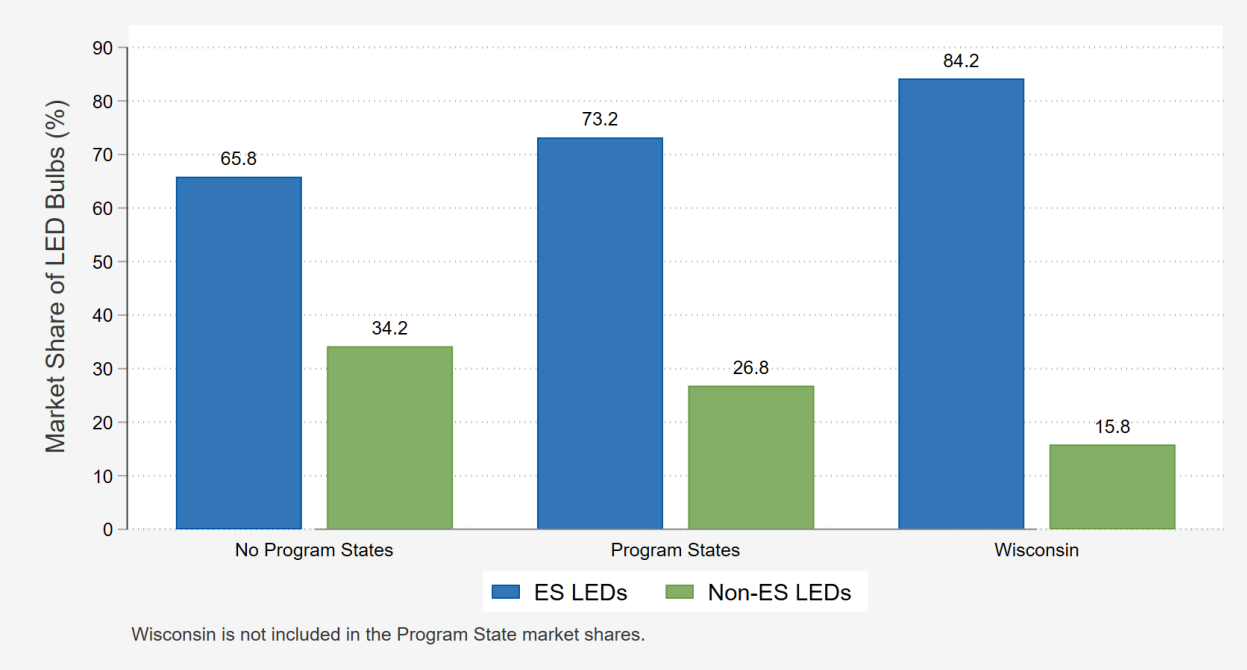


The Evaluation Team looked at ENERGY STAR LED distribution when there was sufficient resolution.[73] As shown in Figure 97, the point-of-sale retail channel shows that 84% of LED purchases in Wisconsin were ENERGY STAR LEDs, whereas only 74% of LED purchases in other program states (excluding Wisconsin) were ENERGY STAR LEDS. States that did not run programs had the lowest share of ENERGY STAR LEDs of the three groups (66%).

It is clear from the data used for the national sales model that program spending was at least partially responsible for an increased market share of LED sales and, in particular, ENERGY STAR LEDs. Although these figures help illustrate program activity in relation to LED sales, the regression analysis provided information about what other factors could be influencing the marketplace and a better understanding of the programmatic impacts. The next section presents the key findings from the national sales model.

[73] Because the ENERGY STAR website does not include the universal product codes (UPCs) of qualifying lamps, the Team had to identify ENERGY STAR-qualified lamps using make, model, and rated lifetime. In total, the Team was successful at attributing 96.5% of LED sales with an ENERGY STAR attribute (that is, whether or not an LED was designated ENERGY STAR). The Team could not identify the remaining 3.5% of LEDs, which are excluded in Figure 97. In addition, the Team conducted this analysis using only the point-of-sale data, as the panel data did not contain sufficient sample size to stratify by ENERGY STAR designation.

Figure 97. ENERGY STAR LED Wisconsin Share (2019 Point-of-Sale Channels)



Program Cost-Effectiveness

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

Table 140 lists the CY 2019 incentive costs for the Residential Lighting and Appliance Program.

Table 140. Residential Lighting and Appliance Program Incentive Costs

	CY 2019
Incentive Costs	$9,241,518

The Evaluation Team found that the CY 2019 Residential Lighting and Appliance Program was cost-effective (4.75). Table 141 lists the evaluated costs and benefits.

Table 141. Residential Lighting and Appliance Program Costs and Benefits

Cost and Benefit Category	CY 2019
Costs	
Administration Costs	$885,017
Delivery Costs	$2,855,028
Incremental Measure Costs	$5,727,329
Total Non-Incentive Costs	**$9,467,374**
Benefits	
Electric Benefits (kWh)	$23,456,750
Electric Benefits (kW)	$7,483,964
Gas Benefits	$1,162,362
Emissions Benefits	$12,880,363
Total TRC Benefits	**$44,983,439**
Net TRC Benefits	**$35,516,065**
TRC B/C Ratio	**4.75**

Evaluation Outcomes and Recommendations

The Evaluation Team compiled the following outcomes and recommendations to improve the Retail Lighting and Appliance Program and Rural Pop-Up Events.

Outcome 1. The lower volume of low-E storm windows and relative newness of the ENERGY STAR certification may require alternative marketing efforts and delivery channels. Although sales of low-E storm windows were noticeably increased relative to sales in a control area (Minnesota), the volume was insufficient to keep two of three big box retail chains engaged in the Program. The relative newness of the ENERGY STAR certification for this measure indicates the possibility of increasing sales by increasing public awareness of the energy-saving potential of this measure.

Recommendation 1. The Program Implementer should develop a general public awareness campaign focused exclusively on low-E storm windows, in addition to ongoing marketing of the low-E storm window incentive. The Program should also consider other delivery channels for low-E storm windows. The independent hardware stores may have greater appetite for lower-volume measures than the big box retail chains, especially if combined with limited-time higher incentives to drive sales during peak season. And though low-E storm windows (which often require custom measurements) would likely not work as a pop-up event measure, the pop-up events could be leveraged to cross-promote low-E storm windows.

Outcome 2. Although CY 2019 Retail Lighting and Appliance Program sales of smart thermostats were lower than CY 2018, the reduction in the incentive does not appear to have a been a significant contributing factor. The launch of the Online Marketplace and end of the instant discount through Nest's website appear to account for at least the majority of the decrease.

Outcome 3. Rural Pop-Up Events accounted for more LED sales than standard pop-ups and were well received by local utilities and rural customers. Although the rural events resulted in fewer advanced power strip sales compared to standard events, they were valuable to local utilities and partners from a promotional standpoint and well-attended by customers. The bulb trade-ins may have been a strong driver of LED sales.

Recommendation 3. The Program Implementer should continue to rely on local utility relationships to site rural pop-ups events and to schedule them to coincide with other community events. The events should also continue to feature trade-ins. The Program Implementer may want to consider offering a similar trade-in for power strips, allowing customers to exchange old power strips for a free or more heavily discounted advanced power strip.

Outcome 4. The retail pop-up experience could be improved by offering a larger product selection. Retail pop-up participants were generally satisfied with the pop-up events. However, the most commonly-selected opportunity for improvement and the second most common open-ended suggestion for improvement was offering a wider variety of products. Specifically, multiple participants requested 100 watt-equivalent bulbs and warm white options. Other suggestions included linear replacement bulbs and holiday lights.

Recommendation 4. The Program Implementer should consider expanding the pop-up product selection to include higher wattage-equivalent bulbs and a larger variety of color options. Doing so will help meet more customers' lighting needs and could further support Program satisfaction.

Outcome 5. The Wisconsin LED reflector market may no longer need Program support. In CY 2019, Wisconsin LED market shares exceed LED market shares in states without programs for most bulb styles. However, LED reflector market shares were the same in Wisconsin and in states without upstream lighting programs (82.9 and 82.6, respectively). When market share in states that do not offer LED incentives begins to catch up to states that do offer incentives, it is an indication the market may not need further Program support.

Recommendation 5: The Program should consider discontinuing incentives for LED reflectors or consider only supporting them in hard-to-reach channels like dollar and drug stores where LED sales still lag behind.

Outcome 6. High annual LED freeridership suggests that Focus on Energy should consider developing plans to phase out LED incentives. Although the Department of Energy recently revised its guidance for general service lamps (GSLs) so halogen lamps will remain the industry baseline for the near future, the high level of annual LED freeridership in Wisconsin indicates the Program may no longer need to provide incentives to move LEDs into homes. However, the Program continues to realize a long-term lift in LED sales (e.g. market effects) due to the Program longevity and the impact of sustained influence on the efficient lighting market through retailer engagement and consumer education.

Recommendation 6. The Program Administrator should work with the Evaluation Team and PSC staff to develop a phase-out plan and determine how to properly account for remaining annual and lifetime energy savings. The Program may want to distinguish between customers who are income-qualified and still require Program intervention.

Recommendation 7. The Program Administrator should work with the Evaluation Team and PSC staff to determine how to properly account for LED bulb sales resulting from sustained market effects in this quadrennium.

Simple Energy Efficiency Program

Through the Simple Energy Efficiency Program, Focus on Energy mails no-cost energy saver packs to Wisconsin residential customers in single-family homes (one to three units) and multifamily homes (four or more units).[74] Customers request packs through the Program's online portal or by calling the Focus on Energy call center. The Program offers an assortment of packs that contain various combinations and quantities of energy-saving products, such as LEDs, faucet aerators, showerheads, and advanced power strips (APS).

APTIM is the Program Administrator, and TechniArt is the Program Implementer.[75]

As part of the PSC initiative to enhance services to rural customers,[76] Focus on Energy added a Farmhouse Kits Program in CY 2019. Unlike standard packs in the Simple Energy Efficiency Program, Farmhouse Kits are delivered to eligible rural customers by the existing network of utility account representatives who work with the Agriculture, Schools and Government Program and are already visiting agricultural customers.

The farmhouse kit includes many of the same energy-saving measures as other Simple Energy Efficiency packs, including LEDs, faucet aerators, showerheads, and pipe wrap. The farmhouse kit also includes unique measures, such as LED night lights, weatherstripping, and outlet and switch gaskets. Focus on Energy is not claiming savings on these unique farmhouse kit measures in CY 2019 but uses them to increase customers' awareness of do-it-yourself ways to save energy beyond lighting and water-saving measures.

The Simple Energy Efficiency Program (excluding Farmhouse Kits Program) delivered 61,839 energy saver packs in CY 2019 and had a benefit/cost ratio of 7.21. Table 142 lists actual Program spending, savings, participation, and cost-effectiveness in CY 2019.

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[74] Focus on Energy uses the term *pack* to distinguish the Simple Energy Efficiency Program from other Wisconsin utility programs that offer energy-saving *kits*.

[75] Implementation duties were transferred from Energy Federation Inc. (EFI) to TechniArt in the middle of CY 2019.

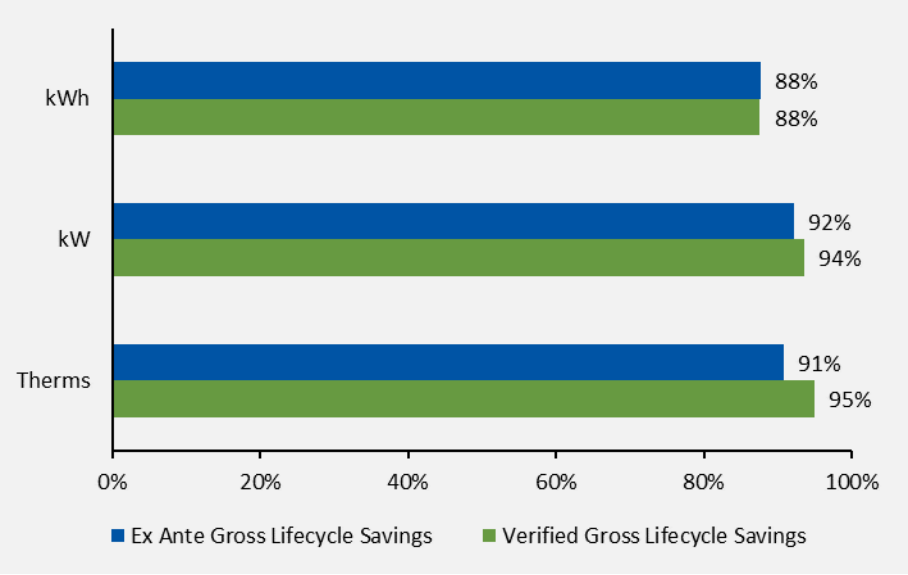
[76] Focus on Energy designated rural areas by zip code according to U.S. Census Bureau data.

Table 142. Simple Energy Efficiency Program Summary

Item	Units	CY 2018	CY 2019
Incentive Spending	$	$1,991,876	$1,337,525
Participation	Number of Participants	89,367	61,849
Verified Gross Lifecycle Savings	kWh	230,255,500	160,632,486
	kW	1,557	1,111
	therms	7,261,922	5,134,973
Verified Gross Lifecycle Realization Rate	% (MMBtu)	99%	102%
Annual NTG Ratio	% (MMBtu)	100%	100%
Net Annual Savings	kWh/year	16,718,646	11,436,295
	kW	1,557	1,111
	therms/year	585,484	409,921
Net Lifecycle Savings	MMBtu	1,511,824	1,061,575
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	6.27	7.21

Figure 98 shows the percentage of gross lifecycle savings goals achieved by the Simple Energy Efficiency Program in CY 2019. The Program did not achieve its electric and natural gas savings goals.

Figure 98. Simple Energy Efficiency Program Achievement of CY 2019 Gross Lifecycle Savings Goals



The 100% *ex ante* gross lifecycle savings reflects the Program Implementer's contract goals for CY 2019. Verified gross lifecycle savings contribute to the Program Administrator's portfolio-level goals.

The Farmhouse Kits Program delivered 505 kits in CY 2019 and had a benefit/cost ratio of 9.09. Table 143 lists actual Program spending, savings, participation, and cost-effectiveness in CY 2019.

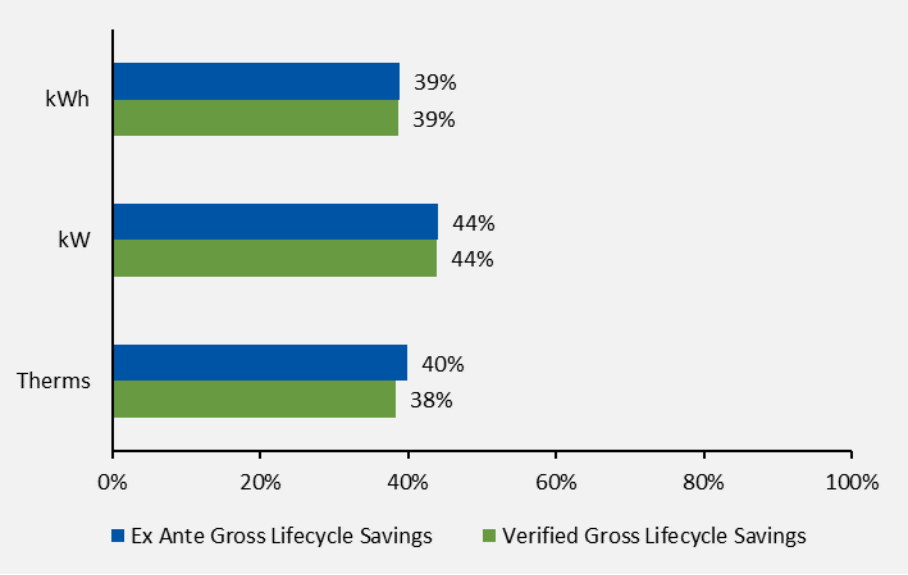
Table 143. Farmhouse Kits Program Summary

Item	Units	CY 2018[a]	CY 2019
Incentive Spending	$	$0	$22,499
Participation	Number of Participants	0	505
Verified Gross Lifecycle Savings	kWh	0	2,290,827
	kW	0	15
	therms	0	79,845
Verified Gross Lifecycle Realization Rate	% (MMBtu)	N/A	98%
Annual NTG Ratio	% (MMBtu)	N/A	100%
Net Annual Savings	kWh/year	0	162,024
	kW	0	15
	therms/year	0	7,030
Net Lifecycle Savings	MMBtu	0	15,801
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	N/A	9.09

[a] The Farmhouse Kits Program was not offered in CY 2018.

Figure 99 shows the percentage of gross lifecycle savings goals achieved by the Farmhouse Kits Program in CY 2019. It did not achieve its electric and natural gas savings goals.

Figure 99. Farmhouse Kits Program Achievement of CY 2019 Gross Lifecycle Savings Goals



The 100% *ex ante* gross lifecycle savings reflects the Program Implementer's contract goals for CY 2019. Verified gross lifecycle savings contribute to the Program Administrator's portfolio-level goals.

Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted impact and process evaluations of the Simple Energy Efficiency Program in CY 2019. The Team designed its EM&V approach to integrate multiple perspectives in assessing Program performance. Table 144 lists specific data collection activities and sample sizes used in the evaluations.

Table 144. CY 2019 Data Collection Activities and Sample Sizes

Activity	CY 2019 Sample Size (n)
Program Actor Interviews	1
Tracking Database Review	Census
Ongoing Participant Satisfaction Surveys	6,571

Program Actor Interviews

The Evaluation Team interviewed the Program Administrator in September 2019 about the Simple Energy Efficiency Program and the newly added Farmhouse Kits Program. The interview focused on high-level changes in CY 2019 and the outcomes of those changes, general performance including areas of success and potential concerns, and potential changes for CY 2020.

Tracking Database Review

The Evaluation Team reviewed the census of Simple Energy Efficiency Program and farmhouse kit records in Focus on Energy's tracking database, SPECTRUM. This review involved completing the following tasks:

- Thorough review of the data to ensure accurate accounting of pack and unit quantities
- Check that application of unit savings and EUL information is consistent with TRM

Ongoing Participant Satisfaction Surveys

The PSC requested that the Evaluation Team conduct satisfaction surveys beginning in CY 2019 for the CY 2019–CY 2022 quadrennium, continuing the practice established for the previous quadrennium in CY 2015. There were two objectives for these satisfaction surveys:

- Understand customer satisfaction on an ongoing basis and respond to any changes in satisfaction before the end of the annual reporting schedule
- Help to facilitate timely follow-up with customers to clarify and address service concerns

The Team used SPECTRUM data to sample CY 2019 participants and administered web-based satisfaction surveys throughout the year. During the first half of CY 2019, the Team supplemented the web-based surveys with mailed paper surveys sent to participants without email addresses on file. The Team combined results from both modes for conducting the analysis.

In total, 6,571 customers responded to the CY 2019 survey. The Evaluation Team selected a random sample of 20%, or 1,345 respondents, for reporting purposes. The survey covered such topics as these:

- Overall satisfaction
- Satisfaction with Program staff
- Likelihood of recommending the Program
- Likelihood of initiating another energy efficiency improvement
- Open feedback regarding the Program (comments and suggestions)

Impact Evaluation

The Evaluation Team used the following approaches to measure the impact of the Simple Energy Efficiency Program:

- Tracking database review
- In-service rate (ISR) determination

Evaluation of Gross Savings

The Evaluation Team reviewed CY 2019 tracking data to ensure the soundness of customer data then applied CY 2017 ISRs (for single-family customers) and CY 2018 ISRs (for multifamily customers) to determine verified gross savings.

In-Service Rates

The ISR represents the percentage of measures still installed and in use following Program participation. The Evaluation Team did not collect data in CY 2019 to update ISRs. Instead, it applied ISRs from CY 2017 single-family participant surveys and CY 2018 multifamily participant surveys to CY 2019 Program activity. These previous survey results provided unique ISRs for each measure in each pack type.

For LEDs, the Evaluation Team calculated lifetime ISRs according to the approach specified in the Uniform Methods Project (UMP).[77] This approach accounts for customers storing the LEDs they receive for later use, once their existing light bulbs burn out or require replacement.

Table 145 shows the measure-specific ISRs for the Simple Energy Efficiency Program, weighted by measure participation and by single-family and multifamily participation.

Table 145. Measure-Specific ISRs – Simple Energy Efficiency Program

Measure	ISR[a]
Faucet Aerator, Bathroom, 1.0 GPM, Pack-Based	56%
Advanced Power Strip, Pack-Based, APS Tier 1	78%
Insulation, DHW Pipe, Pack-Based	39%
LED, Pack-Based, 5 Watt, G25	89%
LED, Pack-Based, 5 Watt, B11	88%
LED, Pack-Based, 8 Watt BR30	92%
LED, Pack-Based, 9 Watt	91%
LED, Pack-Based, 11 Watt	92%
DHW Temperature Turn Down, Pack-Based	18%
Showerhead, Upgraded, 1.5 GPM, Pack-Based	65%
Showerhead, Handheld, 1.5 GPM, Pack-Based	70%

[a] First-year ISRs for non-LED measures; lifetime ISRs for LEDs, per the Uniform Methods Project.

[77] National Renewable Energy Laboratory. October 2017. *The Uniform Methods Project: Methods for Determining Energy Efficiency Savings for Specific Measures.* "Chapter 6: Residential Lighting Evaluation Protocol." Prepared by Apex Analytics, LLC. https://www.nrel.gov/docs/fy17osti/68562.pdf

Table 146 shows ISRs for measures in the Farmhouse Kits Program. These ISRs reflect single-family participant weighted averages from the CY 2019 Simple Energy Efficiency Program.[78] Because the Simple Energy Efficiency Program delivers packs to both single-family and multifamily customers, some ISRs in Table 145 differ from those in Table 146.

Table 146. Measure-Specific ISRs – Farmhouse Kits Program

Measure	ISR[a]
Faucet Aerator, Bathroom, 1.0 GPM, Pack-Based	56%
High Performance EDPM Weatherstripping - Farmhouse Kit	N/A[b]
Outlet Gaskets (8) & Switch Gaskets (4) - Farmhouse Kit	N/A[b]
Insulation, DHW Pipe, Pack-Based	40%
LED, Pack-Based, 9 Watt	91%
LED, Pack-Based, 11 Watt	92%
LED Nightlight - Farmhouse Kit	N/A[b]
Showerhead, Upgraded, 1.5 GPM, Pack-Based	64%

[a] First-year ISRs for non-LED measures; lifetime ISRs for LEDs, per the Uniform Methods Project.
[b] The Program is not claiming savings on these measures in CY 2019.

Verified Gross Savings Results

Table 147 and Table 148 list the annual and lifecycle realization rates for the CY 2019 Simple Energy Efficiency and the Farmhouse Kits programs. Overall, the Simple Energy Efficiency Program achieved a first-year evaluated realization rate of 102%. The Farmhouse Kits Program achieved a first-year evaluated realization rate of 103%, weighted by total (MMBtu) energy savings.

Table 147. CY 2019 Simple Energy Efficiency Program Annual and Lifecycle Realization Rates

Measure	Annual Realization Rate				Lifecycle Realization Rate			
	kWh	kW	therms	MMBtu	kWh	kW	therms	MMBtu
Faucet Aerator, Bathroom, 1.0 GPM, Pack-Based	100%	104%	73%	77%	100%	104%	73%	77%
Advanced Power Strip, Pack-Based, APS Tier 1	114%	114%	N/A	114%	114%	114%	N/A	114%
Insulation, DHW Pipe, Pack-Based	101%	105%	110%	108%	101%	105%	110%	108%
LED, Pack-Based, 5 Watt, G25	97%	97%	N/A	97%	97%	97%	N/A	97%
LED, Pack-Based, 5 Watt, B11	96%	96%	N/A	96%	96%	96%	N/A	96%
LED, Pack-Based, 8 Watt BR30	100%	100%	N/A	100%	100%	100%	N/A	100%
LED, Pack-Based, 9 Watt	99%	99%	N/A	99%	99%	99%	N/A	99%
LED, Pack-Based, 11 Watt	100%	100%	N/A	100%	100%	100%	N/A	100%
DHW Temperature Turn Down, Pack-Based	110%	110%	110%	110%	110%	110%	113%	113%
Showerhead, Upgraded, 1.5 GPM, Pack-Based	100%	100%	100%	100%	100%	100%	100%	100%
Showerhead, Handheld, 1.5 GPM, Pack-Based	108%	108%	108%	108%	108%	108%	108%	108%
Total	**100%**	**102%**	**103%**	**102%**	**100%**	**102%**	**104%**	**102%**

[78] In the Simple Energy Efficiency Program, measure ISRs vary by pack type. The averages listed in Table 146 are weighted by the quantities of packs delivered to single-family participants.

Table 148. CY 2019 Farmhouse Kits Program Annual and Lifecycle Realization Rates

Measure	Annual Realization Rate				Lifecycle Realization Rate			
	kWh	kW	therms	MMBtu	kWh	kW	therms	MMBtu
Faucet Aerator, Bathroom, 1.0 GPM, Pack-Based	99%	104%	74%	77%	99%	104%	74%	77%
High Performance EDPM Weatherstripping	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Outlet Gaskets (8) & Switch Gaskets (4)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Insulation, DHW Pipe, Pack-Based	99%	99%	99%	99%	99%	99%	99%	99%
LED, Pack-Based, 9 Watt	99%	99%	N/A	99%	99%	99%	N/A	99%
LED, Pack-Based, 11 Watt	100%	100%	N/A	100%	100%	100%	N/A	100%
LED Nightlight	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Showerhead, Upgraded, 1.5 GPM, Pack-Based	98%	98%	98%	98%	98%	98%	98%	98%
Total	**99%**	**100%**	**95%**	**97%**	**100%**	**100%**	**96%**	**98%**

Table 149 and Table 150 list the *ex ante* and verified annual gross savings for the Simple Energy Efficiency and the Farmhouse Kits programs for CY 2019 by measure type.

Table 149. CY 2019 Simple Energy Efficiency Program First-Year Gross Savings Summary

Measure	*Ex Ante* Gross First Year			Verified Gross First Year		
	kWh	kW	therms	kWh	kW	therms
Faucet Aerator, Bathroom, 1.0 GPM, Pack-Based	248,680	23	49,713	248,123	24	36,231
Advanced Power Strip, Pack-Based, APS Tier 1	536,774	71	0	611,765	81	0
Insulation, DHW Pipe, Pack-Based	1,531,562	230	172,928	1,554,038	242	190,635
LED, Pack-Based, 5 Watt, G25	777,795	70	0	754,328	68	0
LED, Pack-Based, 5 Watt, B11	591,030	52	0	568,422	50	0
LED, Pack-Based, 8 Watt BR30	1,514,316	136	0	1,508,631	136	0
LED, Pack-Based, 9 Watt	3,895,852	337	0	3,855,341	334	0
LED, Pack-Based, 11 Watt	1,455,728	129	0	1,462,331	130	0
DHW Temperature Turn Down, Pack-Based	36,639	5	15,044	40,228	5	16,517
Showerhead, Upgraded, 1.5 GPM, Pack-Based	402,704	19	80,400	402,223	19	80,145
Showerhead, Handheld, 1.5 GPM, Pack-Based	399,024	19	80,161	430,866	21	86,392
Total First Year	**11,390,104**	**1,093**	**398,246**	**11,436,295**	**1,111**	**409,921**

Table 150. CY 2019 Farmhouse Kits Program First-Year Gross Savings Summary

Measure	*Ex Ante* Gross First Year			Verified Gross First Year		
	kWh	kW	therms	kWh	kW	therms
Faucet Aerator, Bathroom, 1.0 GPM, Pack-Based	4,610	0	885	4,556	0	651
High Performance EDPM Weatherstripping	0	0	0	0	0	0
Outlet Gaskets (8) & Switch Gaskets (4)	0	0	0	0	0	0
Insulation, DHW Pipe, Pack-Based	17,271	3	1,919	17,172	3	1,908
LED, Pack-Based, 9 Watt	52,520	5	0	52,131	5	0
LED, Pack-Based, 11 Watt	64,640	6	0	64,814	6	0
LED Nightlight	0	0	0	0	0	0
Showerhead, Upgraded, 1.5 GPM, Pack-Based	23,830	1	4,573	23,352	1	4,472
Total First Year	**162,871**	**15**	**7,377**	**162,024**	**15**	**7,030**

Table 151 and Table 152 lists the *ex ante* and verified gross lifecycle savings by measure type for the Simple Energy Efficiency and the Farmhouse Kits programs in CY 2019.

Table 151. CY 2019 Simple Energy Efficiency Program Lifecycle Gross Savings Summary

Measure	*Ex Ante* Gross Lifecycle			Verified Gross Lifecycle		
	kWh	kW	therms	kWh	kW	therms
Faucet Aerator, Bathroom, 1.0 GPM, Pack-Based	2,486,810	23	497,131	2,481,230	24	362,315
Advanced Power Strip, Pack-Based, APS Tier 1	3,220,644	71	0	3,670,592	81	0
Insulation, DHW Pipe, Pack-Based	22,973,430	230	2,593,926	23,310,571	242	2,859,523
LED, Pack-Based, 5 Watt, G25	11,666,925	70	0	11,314,926	68	0
LED, Pack-Based, 5 Watt, B11	8,865,450	52	0	8,526,329	50	0
LED, Pack-Based, 8 Watt BR30	22,714,740	136	0	22,629,461	136	0
LED, Pack-Based, 9 Watt	58,437,780	337	0	57,830,116	334	0
LED, Pack-Based, 11 Watt	21,835,920	129	0	21,934,963	130	0
DHW Temperature Turn Down, Pack-Based	545,940	5	218,376	603,416	5	247,760
Showerhead, Upgraded, 1.5 GPM, Pack-Based	4,027,039	19	803,998	4,022,227	19	801,453
Showerhead, Handheld, 1.5 GPM, Pack-Based	3,990,235	19	801,611	4,308,656	21	863,922
Total Lifecycle	**160,764,913**	**1,093**	**4,915,042**	**160,632,486**	**1,111**	**5,134,973**

Table 152. CY 2019 Farmhouse Kits Program Lifecycle Gross Savings Summary

Measure	*Ex Ante* Gross Lifecycle			Verified Gross Lifecycle		
	kWh	kW	therms	kWh	kW	therms
Faucet Aerator, Bathroom, 1.0 GPM, Pack-Based	46,104	0	8,848	45,565	0	6,509
High Performance EDPM Weatherstripping	0	0	0	0	0	0
Outlet Gaskets (8) & Switch Gaskets (4)	0	0	0	0	0	0
Insulation, DHW Pipe, Pack-Based	259,065	3	28,785	257,575	3	28,619
LED, Pack-Based, 9 Watt	787,800	5	0	781,964	5	0
LED, Pack-Based, 11 Watt	969,600	6	0	972,207	6	0
LED Nightlight	0	0	0	0	0	0
Showerhead, Upgraded, 1.5 GPM, Pack-Based	238,298	1	45,732	233,516	1	44,716
Total Lifecycle	**2,300,867**	**15**	**83,365**	**2,290,827**	**15**	**79,845**

Evaluation of Net Savings

Consistent with past analyses, the Evaluation Team has assumed no free ridership or spillover associated with the Simple Energy Efficiency or Farmhouse Kits Programs, resulting in a 100% NTG for all measures provided through the Programs.

Verified Net Savings Results

Table 153 and Table 154 show the annual net demand and energy impacts (kWh, kW, and therms) by measure category for the Simple Energy Efficiency and the Farmhouse Kits programs. The Evaluation Team attributed these savings as net of what would have occurred naturally without the presence of these two programs.

Table 153. Simple Energy Efficiency Program Annual Net Savings

Measure	First-Year Net		
	kWh	kW	therms
Faucet Aerator, Bathroom, 1.0 GPM, Pack-Based	248,123	24	36,231
Advanced Power Strip, Pack-Based, APS Tier 1	611,765	81	0
Insulation, DHW Pipe, Pack-Based	1,554,038	242	190,635
LED, Pack-Based, 5 Watt, G25	754,328	68	0
LED, Pack-Based, 5 Watt, B11	568,422	50	0
LED, Pack-Based, 8 Watt BR30	1,508,631	136	0
LED, Pack-Based, 9 Watt	3,855,341	334	0
LED, Pack-Based, 11 Watt	1,462,331	130	0
DHW Temperature Turn Down, Pack-Based	40,228	5	16,517
Showerhead, Upgraded, 1.5 GPM, Pack-Based	402,223	19	80,145
Showerhead, Handheld, 1.5 GPM, Pack-Based	430,866	21	86,392
Total First Year	**11,436,295**	**1,111**	**409,921**

Table 154. Farmhouse Kits Program Annual Net Savings

Measure	First-Year Net		
	kWh	kW	therms
Faucet Aerator, Bathroom, 1.0 GPM, Pack-Based	4,556	0	651
High Performance EDPM Weatherstripping	0	0	0
Outlet Gaskets (8) & Switch Gaskets (4)	0	0	0
Insulation, DHW Pipe, Pack-Based	17,172	3	1,908
LED, Pack-Based, 9 Watt	52,131	5	0
LED, Pack-Based, 11 Watt	64,814	6	0
LED Nightlight	0	0	0
Showerhead, Upgraded, 1.5 GPM, Pack-Based	23,352	1	4,472
Total First Year	**162,024**	**15**	**7,030**

Table 155 and Table 156 lists the lifecycle net demand and energy impacts (kWh, kW, and therms) by measure category for the Simple Energy Efficiency and the Farmhouse Kits programs.

Table 155. Simple Energy Efficiency Program Lifecycle Net Savings

Measure	Lifecycle Net		
	kWh	kW	therms
Faucet Aerator, Bathroom, 1.0 GPM, Pack-Based	2,481,230	24	362,315
Advanced Power Strip, Pack-Based, APS Tier 1	3,670,592	81	0
Insulation, DHW Pipe, Pack-Based	23,310,571	242	2,859,523
LED, Pack-Based, 5 Watt, G25	11,314,926	68	0
LED, Pack-Based, 5 Watt, B11	8,526,329	50	0
LED, Pack-Based, 8 Watt BR30	22,629,461	136	0
LED, Pack-Based, 9 Watt	57,830,116	334	0
LED, Pack-Based, 11 Watt	21,934,963	130	0
DHW Temperature Turn Down, Pack-Based	603,416	5	247,760
Showerhead, Upgraded, 1.5 GPM, Pack-Based	4,022,227	19	801,453
Showerhead, Handheld, 1.5 GPM, Pack-Based	4,308,656	21	863,922
Total Lifecycle	**160,632,486**	**1,111**	**5,134,973**

Table 156. Farmhouse Kits Program Lifecycle Net Savings

Measure	Lifecycle Net		
	kWh	kW	therms
Faucet Aerator, Bathroom, 1.0 GPM, Pack-Based	45,565	0	6,509
High Performance EDPM Weatherstripping	0	0	0
Outlet Gaskets (8) & Switch Gaskets (4)	0	0	0
Insulation, DHW Pipe, Pack-Based	257,575	3	28,619
LED, Pack-Based, 9 Watt	781,964	5	0
LED, Pack-Based, 11 Watt	972,207	6	0
LED Nightlight	0	0	0
Showerhead, Upgraded, 1.5 GPM, Pack-Based	233,516	1	44,716
Total Lifecycle	**2,290,827**	**15**	**79,845**

Process Evaluation

The Evaluation Team focused the process evaluation on the following key topics:

- Changes in program design, management, and delivery
- Addition of Farmhouse Kits Program
- Change in Program Implementer
- Program tracking processes and coordination among the Program Administrator, Program Implementer, utilities, and utility account representatives
- Marketing, outreach, and cross-promotional efforts

Program Design, Delivery, and Goals

The Evaluation Team interviewed key Program Administrator staff to obtain an overview of the Program's design and delivery processes and to identify any associated changes or challenges.

The Program offered no-cost energy saver packs to residential customers of participating utilities who had not participated in the Program in the last three years.[79] Pack configurations remained consistent with those offered in CY 2018. The Program required customer information, including utility account number, to verify eligibility. To address customer feedback and requests about the contents, the Program Implementer included pamphlets with technical information and installation instructions in each pack and published videos on its website.

Farmhouse kit design and delivery is addressed in the *Addition of Farmhouse Kits* section below.

Program Management and Delivery Structure

The Program Administrator oversees the Program Implementer and Program activity. The Program Implementer contributes to Program design and tracking, assists in Program marketing activities, processes and fulfills customer orders, and manages the customer call center. The Program Administrator noted that, overall, the Simple Energy Efficiency Program ran smoothly in CY 2019, despite changing the Program Implementer.

Program Changes

Two key changes occurred in the Simple Energy Efficiency Program in CY 2019: the transition to a new Program Implementer and addition of the Farmhouse Kits Program. Both changes are described in more detail below.

Change in Program Implementer

The Program Administrator contracted with a new Program Implementer in the third quarter of CY 2019. The Program Administrator selected the incoming Program Implementer based on its local presence (implements other similar programs in Wisconsin) and familiarity with other Focus on Energy programs (subcontracts for the Residential Lighting and Appliance Program's rural pop-up offering).

The Program Administrator said the transition was going smoothly at the time of the interview and was producing positive changes in Program delivery. The new contract allowed the Program Administrator to reallocate funding to other programs without compromising the participation and savings goals of the Simple Energy Efficiency Program.

The incoming Program Implementer also increased the frequency of pack shipments from every four to six weeks to weekly and began including shipment tracking information with each order.

The Program Administrator noted the emergence of some challenges, mostly related to data management, that might typically be expected of an abrupt transition. However, the transition had not caused any major issues.

[79] Each pack was valued at roughly $40.

Addition of Farmhouse Kits

The Program Administrator added a Farmhouse Kits Program in CY 2019 to reach new rural residential customers of participating utilities. These kits include the same energy-saving measures provided in the Simple Energy Efficiency Program pack plus LED nightlights, weatherstripping, and outlet and switch gaskets. Although small savings may be available for LED nightlights, weatherstripping, and outlet and switch gaskets, Focus on Energy is not claiming savings for them in CY 2019.

The Program Administrator believed the cost of researching and preparing materials necessary to appropriately account for the savings within the TRM review and publishing time constraints did not justify the nominal savings. Instead, the Program Administrator uses these measures to cultivate awareness about affordable, do-it-yourself ways customers can save energy beyond lighting and water-saving measures.

In CY 2019, customers did not order or request farmhouse kits. Instead, the kits were provided to eligible customers through the existing network of utility account representatives who work with the Agriculture, Schools and Government Program. These account representatives are a cost-effective way to distribute farmhouse kits directly to the targeted customer base because they already have regularly scheduled meetings with assigned agricultural customers to provide utility and Agriculture, Schools and Government Program support.

During these regular meetings, account representatives offer farmhouse kits to agricultural customers in rural zip codes who also have a farmhouse on the property. The account representatives document participant information in spreadsheets, which they return to the Program Administrator to be uploaded to and tracked in SPECTRUM. The Program Administrator noted that self-reporting by account representatives worked well in CY 2019, with only infrequent and easily resolvable issues arising with data file formats.

Program Goals

The Program's overall objective is to generate energy savings at no cost to residential customers. For CY 2019, Focus on Energy set the following savings goals for the standard Simple Energy Efficiency Program pack offerings:[80]

- Demand reduction of 1,186 kW (an increase from 999 kW in CY 2018)
- Lifecycle electric savings of 183,346,226 kWh (a decrease from 228,785,842 kWh in CY 2018)
- Lifecycle natural gas savings of 5,409,523 therms (a decrease from 9,790,472 therms in CY 2018)

In CY 2019, the Simple Energy Efficiency Program did not meet its electric or gas saving goals because the Program delivered fewer packs than expected.

[80] Metrics presented in this section represent Focus on Energy's targets for the Program and not contractual goals for the Program Implementer. The Program Implementer is required to meet a gross lifecycle MMBtu goal in addition to fuel-specific savings targets.

Focus on Energy also set savings goals specific to the Farmhouse Kits Program:

- Demand reduction of 33 kW
- Lifecycle electric savings of 5,933,200 kWh
- Lifecycle natural gas savings of 208,600 therms

In CY 2019, the Farmhouse Kits Program did not meet its electric savings and demand goals and gas savings goals. The Program Administrator acknowledged that, though the offering operated effectively and as planned, it found low utility demand for and interest in the offering's distribution mechanism (through utility account representatives). The Program Administrator expects to revisit and update the Farmhouse Kits' delivery mechanism in 2020 in an effort to boost Program performance.

Marketing and Outreach

In CY 2019, the Program Administrator engaged in these new marketing efforts to raise Program awareness:

- Direct mail campaign
- Reach-back campaign to remind customers in the CY 2018 Connected Devices Kits Program who had not participated in the Simple Energy Efficiency Program about pack offerings[81]
- Advertisements in a We Energies newsletter that reaches all We Energies residential customers

Program marketing and outreach efforts were otherwise similar to previous calendar years, albeit with a slightly larger digital presence.

Each pack continues to include cross-promotional materials that provide descriptions of and information about participating in other residential Focus on Energy Programs. To track the effectiveness of cross-promotional efforts, the Program Administrator surveys pack recipients about how they heard about the Simple Energy Efficiency Program and compiles their responses in SPECTRUM.

[81] Focus on Energy offered the Connected Devices Kits Program in CY 2018 as part of its effort to address the PSC's initiative to enhance Focus on Energy services to rural customers. The Program was delivered similar to the Simple Energy Efficiency Program but was available only to customers who lived in designated rural areas. The Connected Devices Kits included free and discounted connected LEDs, smart thermostats, and smart power strips.

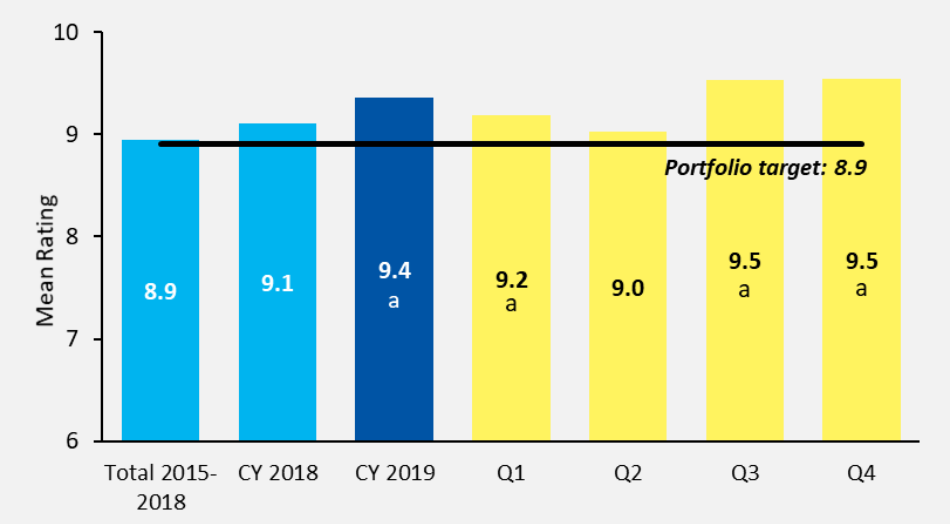
Customer Experience

Annual Results from Ongoing Participant Satisfaction Survey

Throughout CY 2019, the Program Administrator and Evaluation Team surveyed participants to measure their satisfaction with various aspects of the Program. Respondents answered satisfaction and likelihood questions on a scale of 0 to 10, where 10 indicated the highest satisfaction or likelihood and 0 the lowest.[82]

As shown in Figure 100, the average overall Program satisfaction rating among CY 2019 participants was 9.4, which was statistically higher than the portfolio target (8.9) and the average Program rating for CY 2018 (9.1).[83] The Program's satisfaction rating was statistically higher than the baseline during the first, third, and fourth quarters of CY 2019.[84] The Program exhibited higher satisfaction ratings after implementation duties were transferred midyear.

Figure 100. CY 2019 Overall Simple Energy Efficiency Program Satisfaction



Source: Simple Energy Efficiency Program Ongoing Participant Satisfaction Survey Question. "Overall, how satisfied are you with the Focus on Energy Program?" (CY 2018 n=1,050, CY 2019 n=1,336, Q1 n=480, Q2 n=132, Q3 n=401, and Q4 n=323).
Total CY 2015–CY 2018 is the participation-weighted average of four annual results (Express Energy Efficiency Program for CY 2015, Simple Energy Efficiency for CY 2016–CY 2018).
[a] This result is statistically significantly different from the portfolio target ($p<0.10$ or better using binomial t-tests).

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[82] The number of participants who completed a survey does not always match the number of responses for each question because some participants skipped questions, did not know answers to questions, or did not qualify to answer questions based on previous answers or other known data about the participant.

[83] The Program Administrator's contract established a portfolio target of 8.9 to maintain or increase customer satisfaction.

[84] The Evaluation Team found that some surveys did not include identifying information that would allow the matching of survey responses to Program participation dates. The Team included survey responses without participation dates in the year-end total but not in the quarterly breakdown.

Table 157 shows the average satisfaction and likelihood ratings for CY 2019 and CY 2018. In CY 2019, one rating was statistically significantly different from the previous year: participants' likelihood of making more improvements decreased to 8.5 in CY 2019 from 8.6 in CY 2018.

Table 157. CY 2018 Average Ratings for Simple Energy Efficiency Program

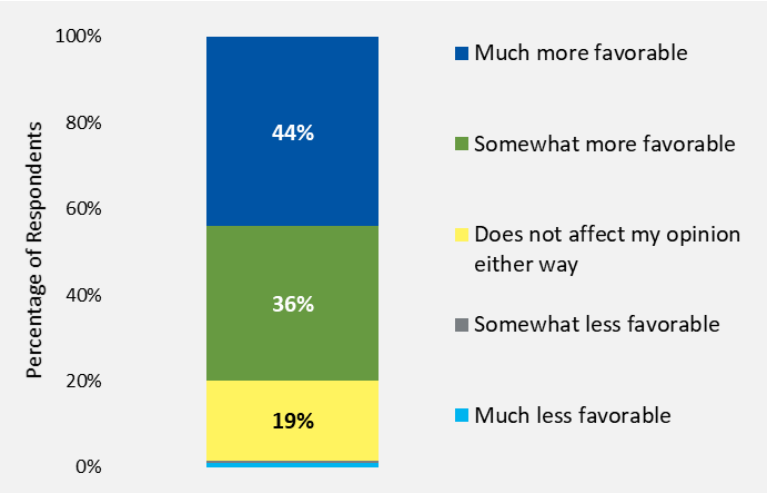
Item	CY 2018	CY 2019
Satisfaction with pack	9.2	9.3
Likelihood of making more improvements	8.6	8.5 [a]
Likelihood of recommending the Program	9.5	9.5

[a] This result is statistically significantly different from the result for CY 2018 ($p<0.10$ using a binomial t-test).

Using these survey data, the Evaluation Team calculated a Net Promoter Score (NPS) based on customers' likelihood to recommend the Program. The NPS is expressed as an absolute number between -100 and +100 that represents the difference between the percentage of promoters (respondents giving a rating of 9 or 10) and the percentage of detractors (respondents giving a rating of 0 to 6). The NPS for CY 2019 participants was +84, which was nearly equivalent to +85 in CY 2018.

CY 2019 Program participants were asked if Focus on Energy offerings affected their opinion of their utilities, and 44% gave the highest rating of *much more favorable* (Figure 101). Only 19% said their opinion was not affected, and 2% reported that their opinion of their utility had become less favorable.

Figure 101. CY 2019 Effect of Focus on Energy Offerings on Opinion of Utilities



Source: Simple Energy Efficiency Program Ongoing Participant Satisfaction Survey Question:
"Your energy utility partners with Focus on Energy to offer energy efficiency programs to its customers. How have these offerings affected your opinion of your utility, if at all?" (n=1,264)

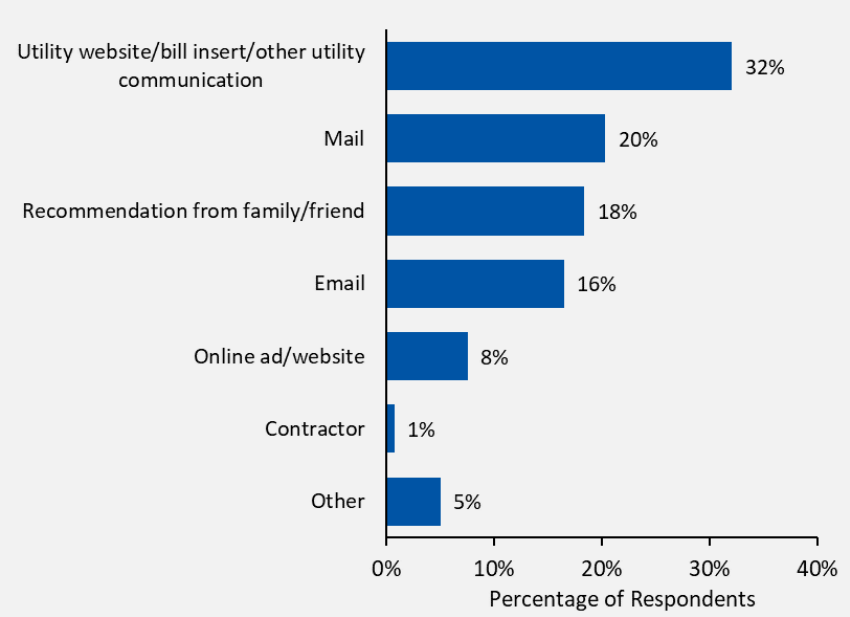
Survey respondents identified the factors that have the most influence on their purchase decisions (Figure 102). The most frequent responses from Simple Energy Efficiency Program participants were deep discounts (34%), followed by reviews from other customers (31%).

Figure 102. CY 2019 Most Valued Factors in Purchase Decisions

Source: Simple Energy Efficiency Program Ongoing Participant Satisfaction Survey Question.
"What do you value the most in making a purchase decision (energy efficiency or otherwise)? Choose your top two from the list below." (CY 2019 n=1,319)

Program participants' two top sources of awareness of the Simple Energy Efficiency Program were communications from their utility (32%) and information received in the mail (20%), as shown in Figure 103.

Figure 103. CY 2019 Sources of Program Awareness

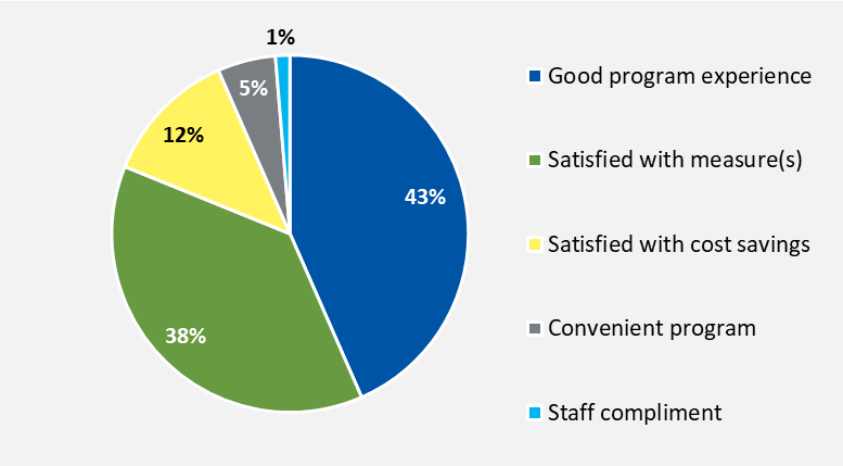


Source: Simple Energy Efficiency Program Ongoing Participant Satisfaction Survey Question.
"How did you learn about this particular opportunity from Focus on Energy?" (CY 2019 n=1,262)

During the customer satisfaction surveys, the Evaluation Team asked participants if they had any comments or suggestions for improving the Program. Of the 1,345 participants in the reporting sample, 24% provided open-ended feedback, which the Team coded into a total of 366 mentions. Of these mentions, 228 were positive or complimentary comments (62%), and 128 were suggestions for improvement (38%).

Respondents' positive comments are shown in Figure 104. The largest share of these were general sentiments of a positive experience (43%) followed by satisfaction with program measures (38%). These were also the two most common responses in CY 2018.

Figure 104. CY 2019 Positive Comments About the Program



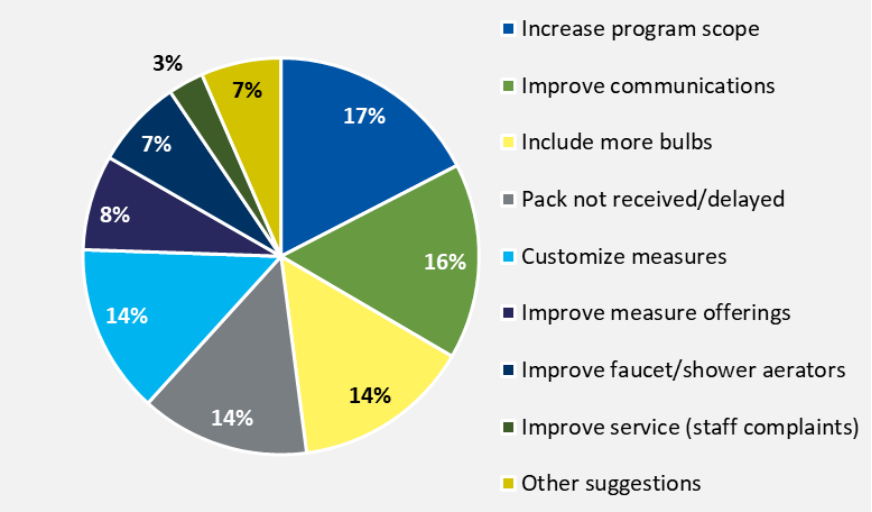
Source: Simple Energy Efficiency Program Ongoing Participant Satisfaction Survey Question: "Please tell us more about your experience and any suggestions." (Total positive mentions: n=228)

Respondents' suggestions for improvement are shown in Figure 105 The most common suggestions regarded increasing the program's scope (17%) and improving communications (16%), which were also the two most common suggestions in CY 2018. The most frequent comments categorized as increasing the Program scope suggested increasing the number of options and the frequency of offerings. Some respondents also mentioned wanting rebates for weatherization improvements and renewable energy.

The most frequent suggestions about improving communications included these:

- Increase outreach to improve awareness of the Program
- Provide resources with further energy saving information or installation instructions for kit items
- More frequent updates on shipping status

Figure 105. CY 2019 Suggestions for Improving the Program



Source: Simple Energy Efficiency Program Ongoing Participant Satisfaction Survey Question: "Please tell us more about your experience and any suggestions." (Total suggestions for improvement mentions: n=138)

Program Cost-Effectiveness

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

Table 158 lists the CY 2019 incentive costs for the Simple Energy Efficiency Program.

Table 158. Simple Energy Efficiency Program Incentive Costs

	CY 2019
Incentive Costs	$1,337,525

The Evaluation Team found that the CY 2019 Simple Energy Efficiency Program was cost-effective (7.21). Table 159 lists the evaluated costs and benefits.

Table 159. Simple Energy Efficiency Costs and Benefits

Cost and Benefit Category	CY 2019
Costs	
Administration Costs	$0
Delivery Costs	$1,062,904
Incremental Measure Costs	$717,505
Total Non-Incentive Costs	**$1,780,410**
Benefits	
Electric Benefits (kWh)	$5,321,907
Electric Benefits (kW)	$1,974,134
Gas Benefits	$2,873,491
Emissions Benefits	$2,665,387
Total TRC Benefits	**$12,834,919**
Net TRC Benefits	**$11,054,509**
TRC B/C Ratio	**7.21**

Evaluation Outcomes and Recommendations

The Evaluation Team identified the following outcomes and recommendations for the Simple Energy Efficiency and Farmhouse Kits Programs.

Outcome #1: SPECTRUM housed and tracked the vast majority of Simple Energy Efficiency Program data without problems. However, the Evaluation Team found that a small number of orders did not fully upload into SPECTRUM, causing these packs to show fewer measures than were delivered. To account for this, Cadmus manually adjusted upward measure-specific unit counts where necessary.

Recommendation #1: Program staff should consider adding or enhancing database quality control protocols for pack and kit programs to ensure all data uploads were processed completely and correctly.

Outcome #2: The Program generated modest participation in the Farmhouse Kits Program in CY 2019, delivering 505 kits to eligible customers through utility account representatives. The Program Administrator acknowledged low interest in the Program through the CY 2019 delivery approach and plans to revisit delivery mechanisms in CY 2020.

Recommendation #2: The Evaluation Team agrees with the Program Administrator's efforts to explore new delivery options. The Program Implementer may consider a targeted outreach campaign like the one employed in CY 2018 for the Connected Devices Kits Program, in which a targeted direct mail campaign directed qualified customers to an exclusive online site where they could order Program kits.

Outcome #3: The TRM provides deemed kWh and therms savings for pack-based faucet aerators and showerheads that are rounded to whole numbers. *Ex ante* savings for these measures reflected TRM deemed savings but were extended to two decimal places. Although this difference minimally affects total program savings, it results in an unusually low therms realization rate for faucet aerators due to their small deemed therms savings.

Recommendation #3. To accurately reflect measure-level realization rates, the Program should update *ex ante* unit savings to reflect deemed TRM values.

NONRESIDENTIAL PROGRAMS

This section presents the evaluation results for CY 2019 for these nonresidential programs.

- Agriculture, Schools and Government Program
- Business Incentive Program
  - Midstream Commercial Kitchen Equipment Offering
  - Midstream Commercial and Industrial Lighting Pilot
- Design Assistance Program
- Large Energy Users Program
- Renewable Energy Competitive Incentive Program
- Small Business Program

Agriculture, Schools and Government Program

Focus on Energy launched the Agriculture, Schools and Government Program in CY 2015 to better serve agricultural and local government customers. In 2019, Focus on Energy separated the program into an agribusiness sector, which focused on serving rural agricultural entities, and a schools and government sector. Through the Program, Focus on Energy offers prescriptive and custom incentives to customers with average peak monthly demand under 1,000 kW.

The following customer groups are eligible for the Program:

- **Agricultural producers** (producers of grain, livestock, milk, poultry, fruits, vegetables, bees and honey, fish, and shellfish as well as greenhouses, grain elevators, and feed mills)
- **Educational entities** (K-12 schools, technical schools, and private four-year colleges)
- **Government entities** (counties, cities, towns, villages, tribes, and state and federal agencies)
- **Municipal wastewater treatment facilities**

These customers can obtain all of Focus on Energy's business incentives through the Program as well as specialized incentives that target agricultural producers, educational entities, and public buildings.

APTIM serves as the Program Administrator, and Cooperative Educational Service Agency 10 (CESA 10) serves as the Program Implementer.

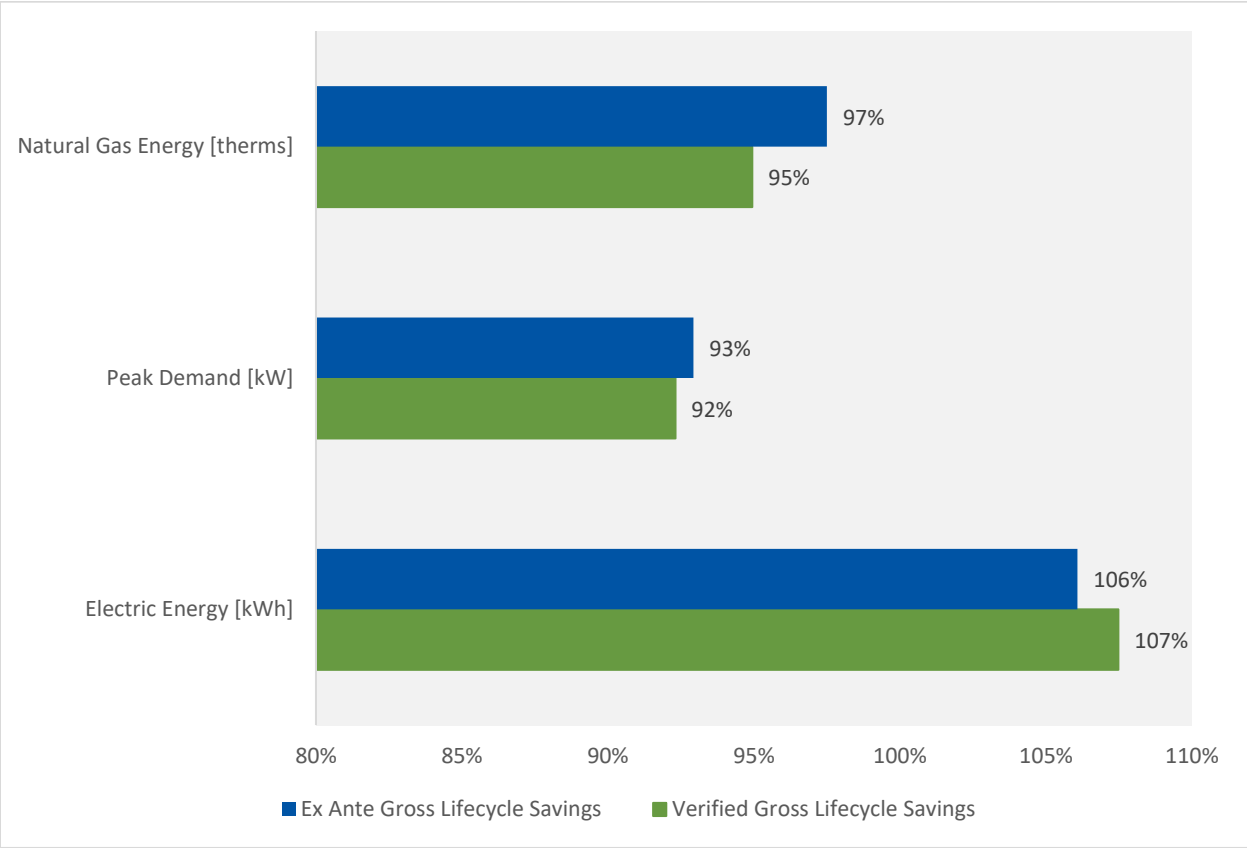
Table 160 lists actual Program spending, savings, participation, and cost-effectiveness in CY 2019.

Table 160. Agriculture, Schools and Government Program Summary

Item	Units	CY 2018	CY 2019
Incentive Spending	$	$8,441694	$9,192,951
Participation	Number of Participants	1,168	1,565
Verified Gross Lifecycle Savings	kWh	1,376,069,930	1,542,008,090
	kW	14,690	13,035
	therms	54,186,157	40,304,904
Verified Gross Lifecycle Realization Rate	% (MMBtu)	102%	100%
Annual NTG Ratio	% (MMBtu)	47%	67%
Net First-Year Savings	kWh/year	46,042,921	71,681,589
	kW	6,904	8,733
	therms/year	1,835,842	1,759,403
Net Lifecycle Savings	MMBtu	4,793,321	6,236,754
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	6.24	2.02

Figure 106 shows the percentage of gross lifecycle savings goals achieved by the Agriculture, Schools and Government Program in CY 2019. The Program exceeded the electrical savings goals but did not achieve the peak demand and gas savings goals.

Figure 106. Agriculture, Schools and Government Achievement of CY 2019 Gross Lifecycle Savings Goals



The Program Implementer is required to meet a gross lifecycle MMBtu goal in addition to fuel-specific savings targets.

Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted impact and process evaluations of the Agriculture, Schools and Government Program in CY 2019. The Team designed its EM&V approach to integrate multiple perspectives in assessing Program performance. Table 161 lists specific data collection activities and sample sizes used in the evaluations.

Table 161. CY 2019 Data Collection Activities and Sample Sizes

Activity	CY 2019 Sample Size (n)
Program Actor Interviews	2
Tracking Database Review	Census
Ongoing Participant Satisfaction Surveys	375
Trade Ally Surveys [a]	14
Trade Ally Interviews	10
Engineering Desk Reviews	42
Verification Site Visits	39

[a] The Program Administrator designed and administered the CY 2019 Trade Ally survey for nine residential and commercial programs. The Evaluation Team analyzed the responses of Agriculture, Schools and Government Program for this evaluation.

Program Actor Interviews

In October 2019, the Evaluation Team interviewed the Program Administrator and the Program Implementer to learn about the current state of the Agriculture, Schools and Governments Program and to assess its objectives, performance, and implementation challenges and solutions. The interviews covered the following topics:

- Program goals and achievements
- Program delivery changes
- Marketing and outreach strategies and effectiveness
- Participation barriers
- Data tracking
- Trade Ally management

Tracking Database Review

The Evaluation Team reviewed the census of Agriculture, Schools and Governments Program records in Focus on Energy's tracking database, SPECTRUM. This review involved completing the following tasks:

- Thoroughly review the data to ensure SPECTRUM totals matched the Program Administrator's reported totals
- Reassign savings from a number of database adjustment measures to corresponding program measures
- Check for complete and consistent applications of information across data fields (e.g., measure names, first-year savings applications, EUL applications)

Ongoing Participant Satisfaction Surveys

The PSC requested that the Evaluation Team conduct satisfaction surveys beginning in CY 2019 for the CY 2019-CY 2022 quadrennium, continuing the practice established for the previous quadrennium in CY 2015. There were two objectives for these satisfaction surveys:

- Understand customer satisfaction on an ongoing basis and respond to any changes in satisfaction before the end of the annual reporting schedule
- Help to facilitate timely follow-up with customers to clarify and address service concerns

The Team used SPECTRUM data to sample CY 2019 participants and administered web-based satisfaction surveys throughout the year. The Team supplemented these surveys with mailed paper surveys sent to participants without email addresses on file. The Team combined results from both modes before conducting the analysis.

In total, 264 schools and government participants and 111 agribusiness participants responded to the CY 2019 survey regarding several topics, such as the following:

- Overall satisfaction
- Satisfaction with Program staff and trade allies
- Likelihood of recommending the Program
- Likelihood of initiating another energy efficiency improvement
- Open feedback regarding the Program (comments and suggestions)

Trade Ally Surveys

The Evaluation Team analyzed survey responses for the 14 Agriculture, Schools and Government Trade Allies who completed the online survey issued by the Program Administrator in 2019. The survey assessed Trade Ally satisfaction with specific program components, usefulness of a future online application portal, Trade Ally marketing practices, and Trade Ally interest in training sessions.

HVAC Trade Ally Interviews

During November 2019, the Evaluation Team conducted in-depth interviews with 10 Trade Allies who completed HVAC projects in 2019 as part of the Agriculture, Schools and Government Program. The Team targeted five low-volume participants (completed one project through the Program in 2019) and five high-volume participants (completed two or more projects through the Program in 2019). Interview topics included Trade Ally promotion and perceived value of the Program, use of Focus-branded marketing materials, relationship with Energy Advisors, satisfaction, and reactions to midstream incentive designs.

Engineering Desk Review

The Evaluation Team reviewed all available project documentation in SPECTRUM for a sample of 42 Program measures. This review included an assessment of the savings calculations and methodology applied by the Program Implementer. The Team relied on the applicable TRMs and other relevant secondary sources as needed. Secondary sources included energy codes and standards, case studies,

and energy efficiency program evaluations of comparable measures (based on geography, sector, measure application, and date of issue).

For prescriptive measures in Wisconsin, the Team used the Focus on Energy TRM and associated workpapers as the primary sources to determine methodology and data in nearly all cases.

For hybrid and custom measures, the Team reviewed the SPECTRUM savings analysis workbooks and adjusted inputs and methodologies as necessary based on engineering judgment and project documentation. The Team selected the evaluation sample for these reviews using a weighted, random stratified sampling approach known as probability proportional to size (PPS), where size is based on lifecycle total energy savings.

Verification Site Visits

The Evaluation Team conducted 39 verification site visits for the CY 2019 Agriculture, Schools and Government Program. Site visits involved verifying the type and quantity of equipment installed, determining how the installed equipment is controlled, and documenting the operating hours of the installed equipment. The Team verified savings calculation input parameters based on operational and occupancy schedules, claimed and observed setpoints, trend data, utility data and any other relevant details identified prior to or upon arrival at the site.

Impact Evaluation

The Evaluation Team used the following approaches to measure the impact of the Agriculture, Schools and Government Program:

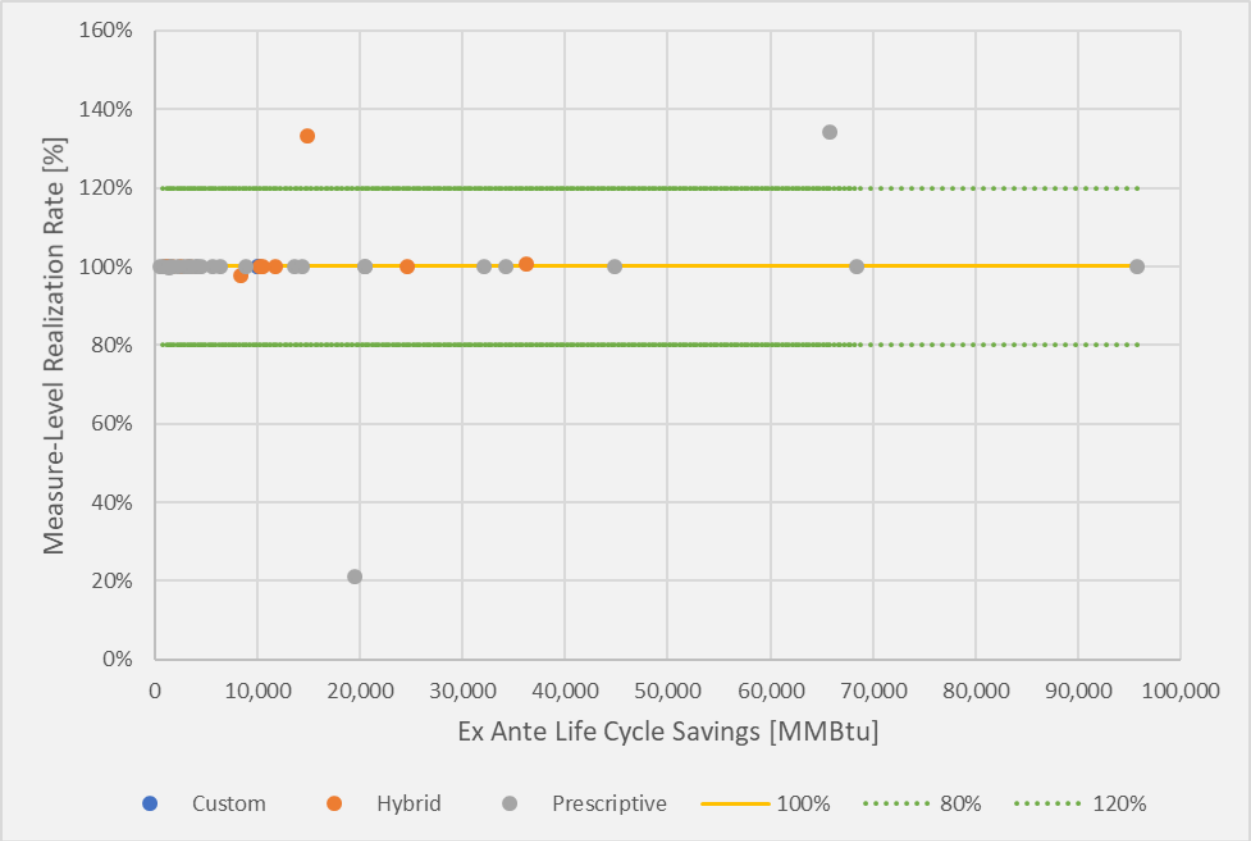
- Tracking database review
- Engineering desk reviews
- Verification site visits

Evaluation of Gross Savings

The Evaluation Team used the CY 2019 tracking data to gather reported installations then applied the results from engineering desk reviews (n=42) and verification site visits (n=39) to determine verified gross savings. The sampled projects represent 30% of Program lifecycle MMBtu savings.

Figure 107 represents the magnitude and associated realization rates for reported MMBtu savings among sampled projects. Two sites had realization rates greater than 120%, and one site had a realization rate below 80%. Specific details related to these projects can be found in *Appendix H*. Thirty-six of 42 projects in the impact sample achieved a 100% energy realization rate. This shows that the Program Implementer is applying the TRM methodology very consistently.

Figure 107. Agriculture, Schools and Government Program Sample Results



Verified Gross Savings Results

Table 162 lists the first-year and lifecycle realization rates for the CY 2019 Program. Overall, the Program achieved a first-year evaluated realization rate of 100%, weighted by total (MMBtu) energy savings. Adjustments to EUL drive the difference between first-year and lifecycle realization rates, particularly in therms savings. The total verified gross savings presented in this report are calculated by applying weighted realization rates to *ex ante* savings. Weighted realization rates were derived from an analysis of a sample of projects chosen using a probability proportional to size (PPS) sampling methodology.

Table 162. CY 2019 Agriculture, Schools and Government Program
First-Year and Lifecycle Realization Rates

Measure	First-Year Realization Rate				Lifecycle Realization Rate		
	kWh	kW	therms	MMBtu	kWh	therms	MMBtu
Total	101%	99%	96%	99%	101%	97%	100%

One project in the sample had an *ex ante* demand savings 10 times greater than the verified *ex post* demand savings. This magnitude of error suggests this difference was caused by a data entry error by misplacing a decimal point. This was a large project with a high weight and the error significantly skewed the demand kW realization rate lower. In reviewing the total sample of sites across all programs, it was

noted that errors occurring from data entry were not common. For CY 2019, of the 238 measures evaluated across all programs, a discrepancy in data entry resulting in a difference in realization rates occurred only on this particular measure.

Therefore, the Team agreed the measure was not reflective of the total Program performance and should not be extrapolated across the population. The Team extracted the measure from the total Agriculture, Schools and Government Program sample and evaluated it in a separate stratum. This resulted in a more representative demand kW realization rate reflective of Program performance.

Table 163 lists *ex ante* and verified annual gross savings for the Program for CY 2019 by measure type.

Table 163. CY 2019 Agriculture, Schools and Government Program First-Year Gross Savings Summary

Measure	*Ex Ante* Gross First Year			Verified Gross First Year		
	kWh	kW	therms	kWh	kW	therms
Aeration	576,356	68	0	581,686	68	0
Air Sealing	31,962	0	7,872	32,258	0	7,532
Boiler	0	0	1,314,483	0	0	1,257,747
Chiller	3,695,219	630	0	3,729,390	629	0
Compressor	6,266	3	0	6,324	3	0
Controls	5,407,426	600	214,391	5,457,430	599	205,138
Delamping	428,948	88	0	432,915	88	0
Dishwasher, Commercial	123,005	0	1,225	124,142	0	1,172
Dryer	37,250	0	69,693	37,594	0	66,685
Economizer	12,766	0	0	12,884	0	0
Energy Recovery	500,465	162	106,780	505,093	162	102,171
Fan	1,832,572	363	9,641	1,849,518	363	9,225
Fryer	0	0	794	0	0	760
Furnace	28,043	5	15,793	28,303	5	15,111
Greenhouse	0	0	7,737	0	0	7,403
Heat Exchanger	1,015,017	0	0	1,024,403	0	0
Infrared Heater	0	0	17,759	0	0	16,993
Insulation	3,449	0	17,021	3,481	0	16,286
Irrigation	82,532	44	0	83,295	44	0
Light Emitting Diode (LED)	58,656,362	7,720	0	59,198,773	7,637	0
Livestock Waterer	473,936	0	0	478,319	0	0
Motor	136,261	29	0	137,521	29	0
Other	4,154,105	584	478,396	4,192,519	584	457,747
Oven	0	0	4,234	0	0	4,051
Pump	55,547	4	0	56,061	4	0
Refrigerated Case Door	1,024	0	0	1,033	0	0
Refrigerator/Freezer - Commercial	3,897	0	0	3,933	0	0
Rooftop Unit/Split System A/C	278,683	190	43,291	281,260	190	41,422
Scheduling	72,691	25	0	73,363	25	0

Measure	*Ex Ante* Gross First Year			Verified Gross First Year		
	kWh	kW	therms	kWh	kW	therms
Steam Trap	0	0	99,255	0	0	94,971
Steamer	19,956	52	1,454	20,141	52	1,391
Study	0	0	0	0	0	0
Tune-up/Repair/Commissioning	685,799	0	303,137	692,140	0	290,053
Variable Speed Drive	27,660,634	2,553	0	27,916,420	2,551	0
Water Heater	26,926	0	27,657	27,175	0	26,463
Window	72	0	3,817	73	0	3,652
Total First Year	**106,007,170**	**13,122**	**2,744,430**	**106,987,447**	**13,035**	**2,625,975**

Table 164 lists *ex ante* and verified gross lifecycle savings by measure type for the Program in CY 2019.

Table 164. CY 2019 Agriculture, Schools and Government Program Lifecycle Gross Savings Summary

Measure	*Ex Ante* Gross Lifecycle			Verified Gross Lifecycle		
	kWh	kW	therms	kWh	kW	therms
Aeration	11,527,120	68	0	11,679,658	68	0
Air Sealing	639,240	0	157,440	647,699	0	153,325
Boiler	0	0	26,289,655	0	0	25,602,505
Chiller	73,904,400	630	0	74,882,375	629	0
Compressor	93,991	3	0	95,235	3	0
Controls	69,282,899	600	3,005,029	70,199,718	599	2,926,485
Delamping	4,289,480	88	0	4,346,243	88	0
Dishwasher, Commercial	1,230,050	0	12,250	1,246,327	0	11,930
Dryer	558,745	0	1,045,372	566,139	0	1,018,048
Economizer	127,660	0	0	129,349	0	0
Energy Recovery	7,506,933	162	1,601,699	7,606,272	162	1,559,834
Fan	28,447,641	363	144,615	28,824,088	363	140,835
Fryer	0	0	9,530	0	0	9,281
Furnace	504,741	5	284,248	511,420	5	276,818
Greenhouse	0	0	45,130	0	0	43,950
Heat Exchanger	15,225,255	0	0	15,426,730	0	0
Infrared Heater	0	0	266,391	0	0	259,428
Insulation	86,225	0	349,755	87,366	0	340,613
Irrigation	1,237,969	44	0	1,254,351	44	0
Light Emitting Diode (LED)	840,900,916	7,720	0	852,028,535	7,637	0
Livestock Waterer	4,739,360	0	0	4,802,076	0	0
Motor	2,426,715	29	0	2,458,827	29	0
Other	36,567,138	584	6,067,696	37,051,030	584	5,909,101
Oven	0	0	50,810	0	0	49,482
Pump	833,205	4	0	844,231	4	0
Refrigerated Case Door	11,267	0	0	11,416	0	0

Measure	*Ex Ante* Gross Lifecycle			Verified Gross Lifecycle		
	kWh	kW	therms	kWh	kW	therms
Refrigerator/Freezer - Commercial	46,764	0	0	47,383	0	0
Rooftop Unit/Split System A/C	4,180,245	190	649,365	4,235,562	190	632,392
Scheduling	363,455	25	0	368,265	25	0
Steam Trap	0	0	595,532	0	0	579,966
Steamer	239,532	52	17,448	242,702	52	16,992
Study	0	0	0	0	0	0
Tune-up/Repair/Commissioning	1,595,843	0	303,137	1,616,960	0	295,214
Variable Speed Drive	414,897,187	2,553	0	420,387,510	2,551	0
Water Heater	403,821	0	415,213	409,165	0	404,360
Window	1,440	0	76,340	1,459	0	74,345
Total Lifecycle	**1,521,869,237**	**13,122**	**41,386,654**	**1,542,008,090**	**13,035**	**40,304,904**

Evaluation of Net Savings

The Evaluation Team did not perform any new NTG evaluation activities in CY 2019 and therefore did not calculate new freeridership or spillover estimates.

Verified Net Savings Results

The Team applied the lifecycle MMBtu weighted historical average of the CY 2015, CY 2016, and CY 2018 NTG ratios to the 2019 verified gross savings to determine the net savings for CY 2019.[85] This yielded an overall NTG estimate of 67% for the Program in CY 2019. Table 165 shows the weighted historical average NTG ratio as well as the total lifecycle gross and net savings.

Table 165. Agriculture, Schools and Government Program Lifecycle Net Savings and Net-to-Gross

Total Lifecycle Gross Verified Savings (MMBtu)	Total Lifecycle Net Savings (MMBtu)	Program Lifecycle NTG Ratio
9,308,589	6,236,754	67%

Table 166 shows the first-year net demand and energy impacts (kWh, kW, and therms) by measure category for the Program. The Team attributed these savings as net of what would have occurred naturally without the presence of the Program.

[85] The Evaluation Team did not perform NTG evaluation activities in CY 2017.

Table 166. Agriculture, Schools and Government Program First-Year Net Savings

Measure	First-Year Net		
	kWh	kW	therms
Aeration	389,729	45	0
Air Sealing	21,613	0	5,047
Boiler	0	0	842,691
Chiller	2,498,691	422	0
Compressor	4,237	2	0
Controls	3,656,478	402	137,442
Delamping	290,053	59	0
Dishwasher, Commercial	83,175	0	785
Dryer	25,188	0	44,679
Economizer	8,632	0	0
Energy Recovery	338,412	109	68,455
Fan	1,239,177	243	6,181
Fryer	0	0	509
Furnace	18,963	3	10,124
Greenhouse	0	0	4,960
Heat Exchanger	686,350	0	0
Infrared Heater	0	0	11,385
Insulation	2,332	0	10,912
Irrigation	55,808	30	0
Light Emitting Diode (LED)	39,663,178	5,117	0
Livestock Waterer	320,473	0	0
Motor	92,139	20	0
Other	2,808,988	391	306,691
Oven	0	0	2,714
Pump	37,561	2	0
Refrigerated Case Door	692	0	0
Refrigerator/Freezer - Commercial	2,635	0	0
Rooftop Unit/Split System A/C	188,444	127	27,753
Scheduling	49,153	17	0
Steam Trap	0	0	63,631
Steamer	13,494	35	932
Study	0	0	0
Tune-up/Repair/Commissioning	463,734	0	194,335
Variable Speed Drive	18,704,001	1,709	0
Water Heater	18,207	0	17,730
Window	49	0	2,447
Total First Year	**71,681,589**	**8,733**	**1,759,403**

Table 167 lists the lifecycle net demand and energy impacts (kWh, kW, and therms) by measure category for the Program.

Table 167. Agriculture, Schools and Government Program Lifecycle Net Savings

Measure	Lifecycle Net		
	kWh	kW	therms
Aeration	7,825,371	45	0
Air Sealing	433,958	0	102,728
Boiler	0	0	17,153,678
Chiller	50,171,191	422	0
Compressor	63,807	2	0
Controls	47,033,811	402	1,960,745
Delamping	2,911,983	59	0
Dishwasher, Commercial	835,039	0	7,993
Dryer	379,313	0	682,092
Economizer	86,664	0	0
Energy Recovery	5,096,202	109	1,045,089
Fan	19,312,139	243	94,360
Fryer	0	0	6,218
Furnace	342,652	3	185,468
Greenhouse	0	0	29,447
Heat Exchanger	10,335,909	0	0
Infrared Heater	0	0	173,817
Insulation	58,535	0	228,211
Irrigation	840,415	30	0
Light Emitting Diode (LED)	570,859,118	5,117	0
Livestock Waterer	3,217,391	0	0
Motor	1,647,414	20	0
Other	24,824,190	391	3,959,097
Oven	0	0	33,153
Pump	565,635	2	0
Refrigerated Case Door	7,649	0	0
Refrigerator/Freezer - Commercial	31,746	0	0
Rooftop Unit/Split System A/C	2,837,827	127	423,703
Scheduling	246,737	17	0
Steam Trap	0	0	388,577
Steamer	162,610	35	11,385
Study	0	0	0
Tune-up/Repair/Commissioning	1,083,363	0	197,793
Variable Speed Drive	281,659,632	1,709	0
Water Heater	274,140	0	270,921
Window	978	0	49,811
Total Lifecycle	**1,033,145,420**	**8,733**	**27,004,286**

Process Evaluation

The Evaluation Team focused the process evaluation on these key topics:

- Participant satisfaction and experience
- Trade Ally satisfaction, engagement, and input on new program designs

Program Design, Delivery, and Goals

The Evaluation Team interviewed the Program Administrator and Program Implementer to obtain an overview of the Program's design and delivery processes and discuss changes in CY19, upcoming initiatives, and marketing and outreach successes and challenges. The Evaluation Team also interviewed the Program Administrator's Trade Ally Policy and Procedure Manager to inform the topics to be covered in the Trade Ally interviews.

The Agriculture, Schools and Government Program recruits customers largely through direct and personal communication between dedicated Energy Advisors (Program Implementer staff) and customers. Each Energy Advisor is assigned to a territory within 150 miles of his or her customers so customers can access a Focus on Energy representative who is familiar with their specific needs.

Participants can also be recruited through a utility contact, a Trade Ally, or a direct customer contact.

Program Management and Delivery Structure

Since the Program's launch in CY 2015, the Program Implementer has taken responsibility for conducting customer outreach, providing Energy Advisors, training Trade Allies, and ensuring that application submissions have complete and correct information. Both the Program Administrator and Program Implementer said the Program focused heavily on the agribusiness sector in CY 2019 because of the new rural initiative led by the PSC, which seeks to increase geographic equity for Focus on Energy participation.

In CY 2019, the Program Implementer created two new Dairy Energy Specialist positions and an Agriculture Technical Energy Specialist position. The goal of the Dairy Energy Specialist position is to strengthen relationships with dairy suppliers, offer specialized assistance to dairy Trade Allies, and serve as a single point of contact for dairy suppliers and Trade Allies. The Dairy Energy Specialists help Trade Allies incorporate Focus on Energy into their sales pitches and recruit new Trade Allies. Nondairy customers and Trade Allies continue to use Energy Advisors as the main point of contact.

The Agriculture Technical Energy Specialist revamped agriculture incentives so they are easier to use and is adding new program measures as new technologies become established in the marketplace.

The Trade Ally Advisor, a new position added in CY 2018, has continued to conduct outreach and coordinate with the Trade Allies who support the school and government market segments.

Program Changes

From CY 2018 to CY 2019, Focus on Energy made several changes to the Program's savings goals, design, and delivery, including the following:

- Updated core incentives
- Offered new special offerings and bonus incentives
- Refined incentives for bonus offerings first offered in prior years

Updates to Standard Measures and Incentive Levels

The Program Implementer made several changes to its standard measure offerings in CY 2019, including the following:

- Added several lighting offerings (including horticultural lighting), HVAC, process systems, commercial refrigeration, and agribusiness
- Increased several agribusiness incentives, including variable speed drives, high bay lighting, ventilation/exhaust and circulation fans, grain dryers, and variable frequency drives
- Removed incentives for new construction electronically commutated motor (ECM) HVAC fan motors (due to a change in standards), lighting troffers with a luminaire level lighting control (LLLC option), and vending machine controls.

New Special Offerings and Bonus Incentives

The Program provides several bonus and special offerings that are designed to reach previously uncontacted customers and create ratepayer equity. The Program kept most of the bonus offerings present in CY 2018 and added four new special offerings or bonuses in CY 2019.

Grain dryer tune-up. From August 1 through December 31, 2019, the Program provided a $150 grain dryer tune-up incentive for corn dryers.

Propane offering. Focus on Energy, in partnership with the PSC's Office of Energy Innovation, offered energy efficiency incentives for agricultural customers who use propane to fuel specific equipment in conjunction with an electric utility that participates in Focus on Energy. Funding came from the U.S. Department of Energy State Energy Program grant. Incentive amounts for efficient propane equipment were consistent with CY 2019 natural gas incentive amounts. The offering was distributed through existing delivery channels and communicated through Trade Allies.

Agribusiness service provider payment. Beginning January 1, 2019, this offering was designed to reward Trade Allies serving the agriculture industry to incorporate energy efficiency benefits and incentive opportunities into their sales process. The payment offering is detailed in Table 168.

Table 168. Agribusiness Service Provider Payment Offering

Offering	Trade Ally Payment
Customer Incentive <$100	$25
Customer Incentive >$100	25% of Customer Incentive
Maximum Payment Each Year	$10,000
Maximum Payment Each Year	$10,000

Farm disaster bonus. The Program offered a 25% bonus on top of existing energy efficiency incentives to farms impacted by a natural disaster that damaged their facilities. Customers needed to apply by June 1, 2019, and the facility had to require that reconstruction was due to impacts of a natural disaster in 2019. The bonus applied to equipment located in the damaged facility.

Program Goals

The Program's overall objective is to encourage businesses, schools, and government organizations to use more energy-efficient products. For CY 2019, Focus on Energy set the following savings goals for the Agriculture, Schools and Government Program:[86]

- Demand reduction of 14,120 kW (increase from 9,500 kW in CY 2018)
- Lifecycle electric savings of 1,434,680,000 kWh (increase from 1,141,193,000 kWh in CY 2018)
- Lifecycle natural gas savings of 42,448,716 therms (increase from 38,000,000 therms in CY 2018)

In CY 2019, the Program achieved 107% of its electric savings goal, 92% of its demand reduction goal, and 95% of its therms savings goal based on verified gross lifecycle savings. In terms of participation, the CY 2019 Program received 34% more applications than the CY 2018 Program, with the agribusiness sector seeing a larger increase in application than the schools and government sector (Table 169).

Table 169. Agriculture, Schools and Government Program Applications, CY 2018 to CY 2019

Year	Number of Agribusiness Applications	Number of Schools & Governments Applications
CY 2018	659	1,472
CY 2019	1,274	1,572

In CY 2019, 1,565 unique customers participated compared to 1,168 in CY 2018 (also a 34% increase).

Marketing and Outreach

In CY 2019, the Program Administrator and the Program Implementer worked closely to develop marketing and outreach materials and strategies to customers and Trade Allies. They explained that because of strong participation in CY 2019, the Program conducted a lighter marketing campaign for schools and government sectors than in recent years. In fall 2019, the Program Administrator projected

[86] Metrics presented in this section represent Focus on Energy's targets for the Program and not contractual goals for the Program Implementer. The Program Implementer is required to meet a gross lifecycle MMBtu goals in addition to fuel-specific savings targets.

that the Program would meet its savings goals and run out of budget by December 1, 2019. Rather than increasing participation, the Program focused on maintaining strong existing relationships with its customers and stakeholders.

Customer Outreach

For CY 2019, the Program set a goal, which it achieved, to recruit schools and municipal projects in 43% of Wisconsin zip codes. As in previous years, in CY 2019 the Program relied heavily on Energy Advisors who engaged schools and governments by presenting at school and municipal events and conducting email outreach.

For schools that had previously participated in a 2018 special offer that increased schools' understanding of their energy use, Energy Advisors followed up to discuss projects. This extra step helped strengthen the Program's relationship with customers and built a pipeline for future projects.

For municipal governments, the Program Implementer worked with municipal sustainability teams to identify potential improvements, establish priorities, and understand incentive opportunities. The Program Implementer also collaborated with utilities to ensure their representatives were equipped to inform their municipal customers about the Agriculture, Schools and Government Program. For municipal wastewater customers, the Program marketed directly to wastewater service providers.

For the agriculture sector, the Program Implementer continued to target both dairy and nondairy customers and set a goal to increase nondairy participation with a particular focus on greenhouses and nurseries. As in previous years, the Program Implementer relied less on Energy Advisors and more on Trade Allies and subject matter experts in the industry to market the Program to agriculture customers. The Implementer also used direct mailers and radio advertisements and collaborated with utility representatives and professional organizations to increase awareness of Focus on Energy incentives.

Trade Ally Outreach

During CY 2019, the Program Implementer conducted ongoing outreach to Trade Allies, which included direct communications and tailored emails along with attending various forums and events to build relationships and promote the Program. Agribusiness Trade Allies also received quarterly newsletters.

The Program Administrator and Program Implementer thought the new Agribusiness Service Provider Payment was very successful at increasing Trade Ally engagement with the Program. They said that applications for unique customers in CY 2019 almost doubled since the previous year. In addition, 18 new Trade Allies registered, and four new Trade Allies participated for the first time.

Trade Ally Feedback on Marketing

The Evaluation Team interviewed 10 Trade Allies about marketing. When asked which Focus on Energy marketing materials were most effective, eight Trade Allies said the Program catalogue containing incentive information and paperwork. They also relied on emails from the Program containing updates about incentives and direct customer support from Energy Advisors (for schools and governments).

Interviewed Trade Allies said the following marketing materials would be helpful:

- Simple case studies that illustrate project payback, utility bill savings, and increased equipment lifespan (two respondents)
- One Trade Ally suggested providing contact information for someone involved with the project.
- An improved Program catalogue (two respondents)
- One Trade Ally recommended simplifying the catalogue so any customer or contractor could understand it. Another recommended splitting the catalogue into a very simple guide for customers and a more technical guide for contractors.
- A flyer for each equipment incentive (one respondent)
- A one-page cheat sheet for the Program (one respondent)
- A summary of all Focus on Energy incentives, not just those for the Program (one response)
- A more user-friendly website (one respondent)
- Marketing materials that put energy savings in terms that customers can understand, such as the cost of textbooks for school customers (one respondent)

Preferences for Staying Informed

Most Trade Allies preferred to hear about Program updates and training via email. Some also wanted the Focus on Energy website to publish training opportunities and any changes to the Program. Some wanted to hear from their Program representatives directly (three respondents) or in hardcopy form (two respondents).

Trade Ally Experience with the Program

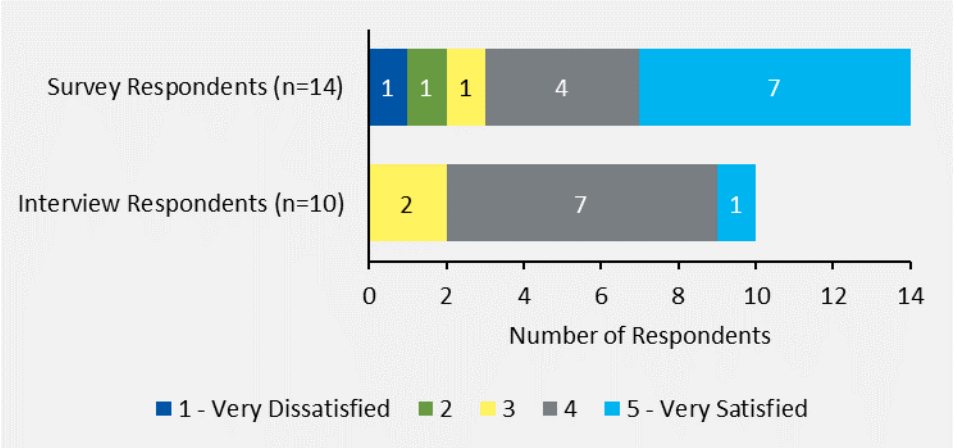
The Evaluation Team conducted in-depth phone interviews with 10 Trade Allies who completed HVAC equipment projects as part of the Agriculture, Schools and Government Program. The Team also analyzed responses from the 14 Trade Allies who completed the online survey conducted by the Program Administrator. These respondents specialized in electrical, HVAC, refrigeration, and plumbing services. Five identified themselves as retailers/distributors.

Both the online survey and the phone interviews assessed Trade Ally satisfaction, program marketing practices, and preferences for training and for an online application portal. One of the main objectives of the phone interviews was to gather input on midstream incentives, a change the Program Administrator instituted in 2020.

Satisfaction with the Program

Trade Allies were asked in the survey and interviews to rate their overall satisfaction with Focus on Energy on a scale of 1 to 5, where 1 indicated *very dissatisfied* and 5 indicated *very satisfied.* On average, survey respondents rated their overall satisfaction a 4.7 (n=14), and interview respondents gave an average rating of 3.9 (n=10). No interview respondents gave a rating lower than 3. One survey respondent gave a rating of 2 and one gave a rating of 1 (Figure 108).

Figure 108. Trade Ally Overall Satisfaction with Focus on Energy



Source: CY 2019 Trade Ally Surveys Question "Overall, how satisfied are you with Focus on Energy?" and CY 2019 HVAC Trade Ally Interview Guide Question C10 "How satisfied are you with the Program overall?"

Trade Allies who explained why they provided an overall satisfaction rating of 4 or 5 mentioned these positive aspects:

- Can more easily sell energy-efficient equipment (two respondents)
- Focus on Energy staff are easy to work with and answer questions quickly (two respondents)
- The Program is easy to use (one respondent)

Respondents who rated their overall satisfaction as less than *very satisfied* gave the following reasons:

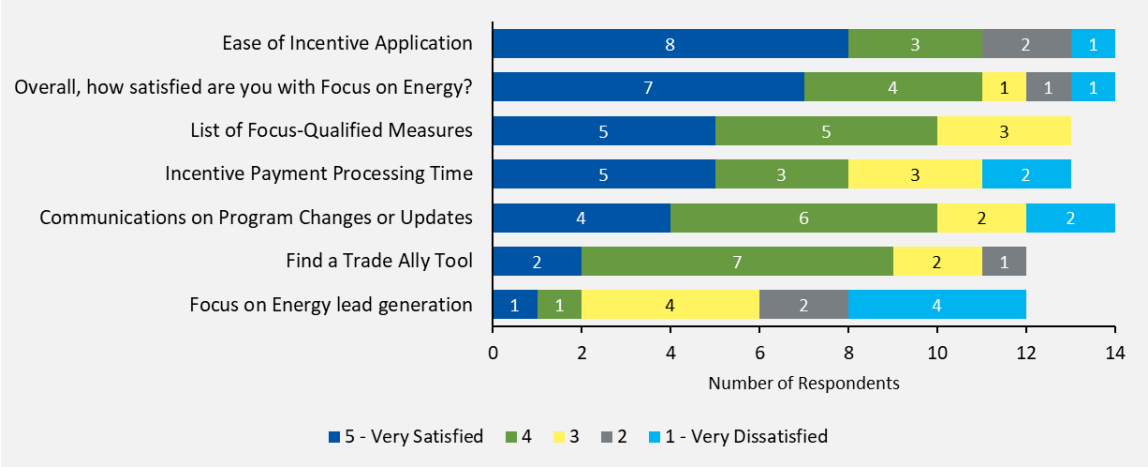
- Time-consuming or complicated rebate applications (four respondents)
- Perception that incentives have decreased over time (two respondents)
- Perceived need for higher incentives (two respondents, with one who thought incentives are higher in neighboring states)
- Perceived need for more products to qualify for incentives (on respondent)
- Need for more detailed specifications about what qualifies, specifically for controls (one respondent)
- Perception that turnaround time to receive incentives takes too long (one respondent)

Survey respondents also rated their satisfaction with various program aspects on a scale of 1 to 5, where 1 indicated *very dissatisfied* and 5 indicated *very satisfied*.

As shown in Figure 109, Trade Allies were most satisfied with the ease of the incentive application and least satisfied with lead generation and the Find a Trade Ally Tool published on the Focus on Energy website. Most Trade Allies gave a rating of 4 or 5 for all Program aspects except Focus on Energy's ability

to generate customer leads for their business.[87] For the Find a Trade Ally tool, one respondent noted, "I don't know what a Trade Ally Tool is!"

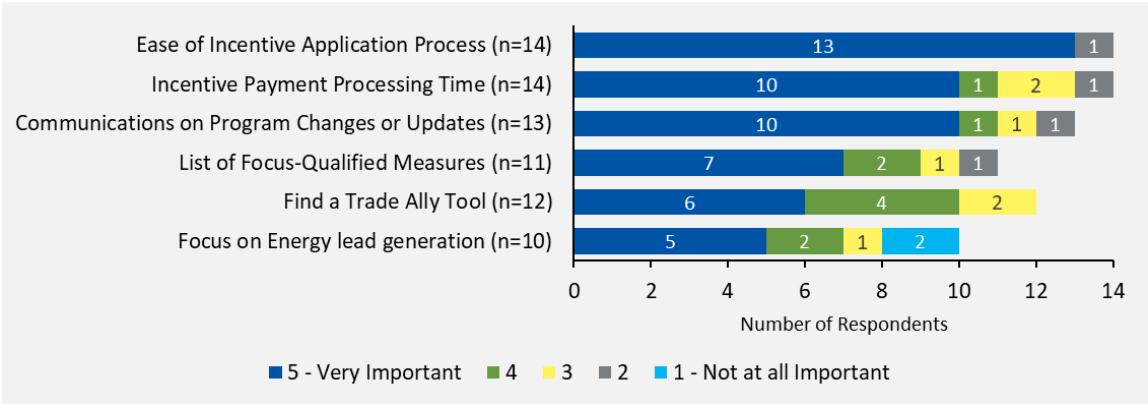
Figure 109. Trade Ally Survey Respondent Satisfaction with Program Aspects



Source: CY 2019 Trade Ally Surveys Question "Overall, how satisfied are you with Focus on Energy? (Scale 1-5, where 1=very dissatisfied and 5 = very satisfied)"

In addition to satisfaction, Trade Ally survey respondents also rated how important these aspects of the program are to them. Similar to their satisfaction ratings of program aspects, most Trade Allies rated ease of incentive application process as *very important* and Focus on Energy lead generation as the least important program aspect (Figure 110). Most Trade Allies also considered incentive payment processing time and communication on program changes or updates to be *very important*.

Figure 110. Trade Ally Survey Respondent Ratings for Importance of Program Aspects



Source: CY 2019 Trade Ally Survey Question "How Important is…"

[87] It is possible that some Trade Allies misinterpreted this survey prompt, which was intended to determine if Focus on Energy helped with lead generation in a general way. Focus on Energy does not directly provide Trade Allies with customer leads.

When asked what value they see in participating in the Agriculture, Schools and Government Program, five interviewed respondents said helping customers save money through the incentives, five said increased sales, and five said support from their Energy Advisor.

Three Trade Allies said they found value from the training. Of the respondents who did not, one said the training was not technical enough and lasted too long, one said the timing of the training is not ideal, and one said HVAC companies can already receive training through their vendors. Only one Trade Ally agreed that the Program helped with lead generation.

Online Trade Ally Portal

Both the survey and interviews asked Trade Allies about their preferences if an online application portal were made available by Focus on Energy. Seven interviewed respondents were *very likely* and three were *somewhat likely* to use an online application, with several respondents specifically adding that they thought it would help improve automated communication about the status of the application and reduce the back-and-forth. Two interviewed Trade Allies suggested that the online portal contain a checkbox of application requirements to show the Energy Advisor which documents had been submitted.

The Trade Ally survey asked respondents to rank seven types of information in order of usefulness if Focus on Energy were to provide the information in an online Trade Ally portal (where 1 was the *most useful* and 7 was the *least useful*). As shown Table 170, respondents gave the highest rankings for the incentive application status and energy savings by project in the past 12 months. They ranked incentives paid (by project) in the past 12 months the least useful.

Table 170. Trade Ally Survey Respondent Rankings of Information Usefulness to Be Included in an Online Application Portal

Average Rank	Online Trade all Portal Information
1	Incentive application status (in-progress, approved for payment, paid)
2	Energy Savings (by project) in the past 12 months
3	Incentive payment details (which projects were paid on a check)
4	Contact information for your local Energy Advisor(s)
5	Focus on Energy Program updates and information
6	Training opportunities relevant to your business
7	Incentives paid (by project) in the past 12 months

Source: CY 2019 Trade Ally Survey Question "If Focus on Energy were to provide your company with access to an online Trade Ally Portal, what information would you find most useful to have available? Please rank the following features in order of usefulness to you, where 1 is the MOST useful, and 7 is the LEAST useful."

Trade Ally Marketing Practices

When asked about how often Trade Allies promoted or included Focus on Energy incentives in their project proposals, 12 of 14 survey respondents reported *all the time,* one reported *sometimes,* and one reported *seldom.* Fewer interview respondents (six of the 10) reported *always* promoting Focus on

Energy incentives in their project proposals, and four reported that they *sometimes* do this. When survey respondents were asked why they do not promote Focus on Energy incentives more often, one respondent answered, "Not all projects are eligible for Focus money," and one reported not including the incentives in the proposal if the customer had already committed to completing a project.

When asked about specific cost information to help make the case for the energy-efficient project, four of 10 interviewed Trade Allies said they promote payback or return on investment (ROI) as program benefits. Five said they promote energy efficiency and cost savings.

When asked how Focus on Energy could improve its website, interview respondents provided a variety of suggestions:

- Make it easier to find documents (two respondents, with one suggesting that Focus on Energy provide a link to documents and program catalogues along the website's top banner)
- Provide a separate Trade Ally landing page where they can find everything they need for the program (two respondents)
- Provide an energy savings calculator based on project type (two respondents)
- Provide a map that clearly shows the geographic boundaries for each Energy Advisor (one respondent)
- Provide a short questionnaire that will direct customers to the program that best fits their needs (one respondent)

Trade Ally Training

The Program Administrator explained that Focus on Energy provides technical training and holds a Trade Ally Forum. The Program Administrator also purchased several one-year subscriptions to a series of six-minute online videos on energy efficiency sales training offered by Mark Jewell.[88] The subscriptions were raffled off at the 2019 Trade Ally Forum. The Program also sponsored a one-day training with Mark Jewell on sales techniques for energy efficiency.

In addition, the Program Implementer provides Program-specific overviews to Trade Allies. The Program Implementer provided these program overviews to sales and service staff at individual companies throughout CY 2019 and hosted two webinars for wastewater service providers. The training involved the following topics:

- HVAC, boiler tune-ups and express building tune-ups (EBTU) (six companies)
- HVAC, drives, pumping systems overview (one company)
- Agriculture Program update (one company)
- Grain dryers (two companies)

[88] Selling Energy. "Boldly Go into the World of Mobile Learning with Selling in 6." https://www.sellingenergy.com/product-cat/selling-in-6-products/

- Lighting incentives: lighting power density (LPD), networked lighting controls (NLC), and comprehensive lighting initiative (CLI) (3 companies)
- Prescriptive and custom projects (4 companies)
- Prescriptive and custom incentives versus Design Assistance Program (1 company)

The interviewed Trade Allies reported their attendance at the CY 2019 Focus on Energy Training listed in Table 171. They were asked to rate their satisfaction with or interest in attending the training on a scale of 1 to 5, where 1 indicated *very dissatisfied* and 5 indicated *very satisfied*. Most Trade Allies attended the 2019 Trade Ally Forum and gave it an average satisfaction rating of 4. One Trade Ally said the Forum provides a good chance to network, but another expressed disappointment in the level of information provided and said sessions that were promoted to last one hour lasted only 15 minutes.

Table 171. Trade Ally Attendance of PY2019 Focus on Energy Training

Training Type	Number of Interviewees who Reported Participating	Average Participant Satisfaction Rating (scale of 1-5)	Nonparticipant Interest in Attending (scale of 1-5)
The Focus on Energy Trade Ally Forum	6	4	2.5
In-person workshop for HVAC applications	2	4	3.8
In-person workshop for another topic	2	4	N/A (no one provided a rating)
Learning to SEE (Selling Efficiency Effectively) from Mark Jewell of Selling Energy	1	4	4
The series of online videos on sales training from Mark Jewell	1	4	4

Source: CY 2019 HVAC Trade Ally Interview Guide "Have you participated in any of the following Focus on Energy training events?"

Interviewed Trade Allies recommended the following to improve training:

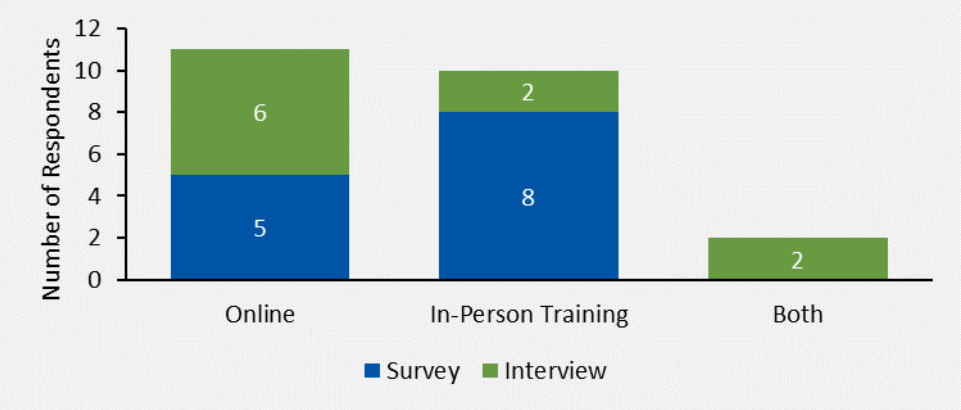
- Shorter training (four respondents)
- Online training (four respondents)
- More technical training, since the current training is too rudimentary (two respondents)
- Schedule training at other times than during the busy HVAC seasons (one respondent)
- Hold training at individual Trade Ally offices (one respondent)
- Offer smaller, more frequent training opportunities around the state (one respondent)

Four of the 10 interviewed Trade Allies said they were not aware training took place. Nine of these Trade Allies agreed that email is the best way for them to receive information about future training. Eight respondents said time constraints were a challenge to attending training, and two thought the training was not worth the travel time.

Both survey and interviewed Trade Allies were asked about their preferences for in-person or online training. Figure 111 shows that six survey and five interviewed Trade Allies preferred online training, and two interviewed and eight survey Trade Allies preferred in-person training. Of the interviewed

respondents who preferred online training, four preferred recorded webinars so that they could ask questions, and two preferred short videos.

Figure 111. Trade Ally Preference for Online versus In-Person Training



Source: Focus on Energy CY 2019 Interview Guide: HVAC Trade Allies. QE6. "When attending trainings, do you prefer that the training is…" (n=9), and CY 2019 Trade Ally Survey Question "Focus on Energy offers trainings for Trade Allies and customers throughout the year. What type of training would you find most beneficial to your business?" (n=14)

Trade Allies were asked how far they were willing to travel for in-person training. Five survey respondents chose *51 to 100 miles*, seven chose *up to 50 miles*, and two were *not willing to travel*. Interviewed respondents expressed a willingness to travel longer distances: two said *one to two hours*, two said *two to three hours*, and one said *anywhere in the state*. However, the two Trade Allies who were willing to travel two to three hours agreed that only high-quality training would be worth their time. Just one Trade Ally was not willing to travel any distance.

The survey asked Trade Allies about training that Focus on Energy could offer throughout the year. When asked what type of training would be most beneficial to their business, six survey respondents selected technical training, four selected training on how to navigate the Focus on Energy programs, and two selected sales training. One each of the interviewed respondents recommended these specific training topics:

- Energy-efficient building operations
- Industrial refrigeration
- A webinar on how to complete rebate paperwork
- Compressed air strategies
- A more technical waste heat recovery training than is offered now
- How to identify low-hanging fruit for customers

Input on Future Program Design and Offerings

The survey asked Trade Allies what new or innovative program designs, technologies, or solutions Focus on Energy should consider offering to customers. Their suggestions focused on program design rather than new technologies. The Evaluation Team also asked interviewed respondents if Focus on Energy is

missing out on energy efficiency opportunities for which it does not offer incentives. Trade Ally suggestions are shown in Table 172.

Table 172. Trade Ally Suggestions for Program Design and New Measures

Program Design Suggestions (Survey Respondents, n=3; Interview Respondents, n=10)	New Measure Suggestions (Interview Respondents, n=5)
• Streamline rebate process (5) • Provide customers with net present value calculations instead of a linear three-year payback (1) • Provide one-year financing to customers (1) • Have Energy Advisors engage more with Trade Allies through in-person meetings, act like salespeople to sell the Program (1) • Identify a Program Champion in each Trade Ally company (1) • Publish the incentive catalogues for the next year well in advance (1)	• Variable refrigerant flow systems (1) • Solar panels (1) • Building systems automation (1) • Prescriptive steam to hot water measures (1) • More prescriptive measures in general (1)

Program Incentives

The 10 interviewed Trade Allies gave feedback about Program incentives. When asked about their preferences for how Focus on Energy could increase incentive amounts, most of the 10 interviewed Trade Allies preferred a higher base incentive without any bonuses or special offerings over limited-time bonuses. Eight respondents preferred the higher base incentive, one preferred limited-time offers, and one thought this depended on the type of equipment. Those who preferred the base incentive mainly cited the difficulties with quick paperwork submission and aligning project timelines with limited time offers, especially because some customers such as schools need a longer approval timeline. Several respondents also said they disliked changing incentive levels because they are hard to track.

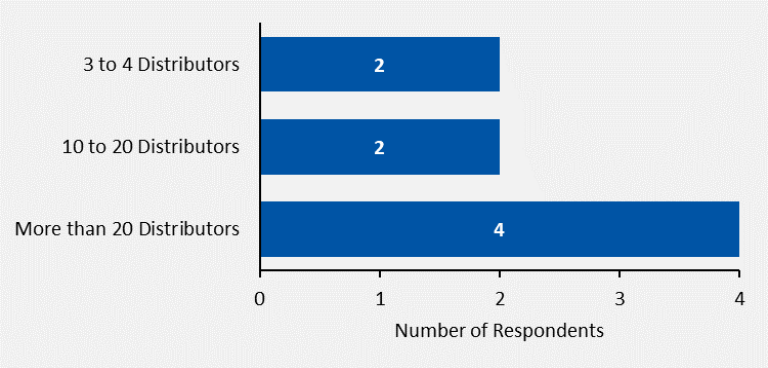
Midstream Incentives

In CY 2020, the Program Administrator will revise the incentive delivery structure for several measures—ECM pumps, ductless heat pumps, and heat pump water heaters—to shift the incentive payment from the contractor or customer to equipment distributors. This is known as a midstream incentive. In exchange, distributors will stock eligible equipment and discount the price of equipment to contractors, who in turn will provide site and customer utility information to the distributor.

The Evaluation Team asked the interviewed Trade Allies about their impressions of this upcoming change and their perspectives on current stocking and distribution practices of efficient equipment.

Trade Allies were first asked about their relationships with distributors and distributors' equipment availability. Respondents said they worked with a range of distributors—three or four up to a dozen or more (as shown in Figure 112). Some respondents explained that they purchase different types of equipment from the distributors. Eight respondents said the energy-efficient equipment is *always* or *almost always* in stock when they need it, and two reported that energy-efficient equipment can quickly be ordered via special order.

Figure 112. HVAC Trade Allies' Distributor Network



Source: CY 2019 HVAC Trade Ally In-Depth Interviews. Question D1: "How many equipment distributors do you work with?" (n=8)

As shown in Table 173, two Trade Allies expressed positive opinions, three expressed mixed opinions, and five expressed negative opinions about the potential design change to a midstream program. Trade Allies found the concept most appealing because they thought it would lead to higher sales of energy-efficient equipment and least appealing because it would be difficult to prove a price discount actually occurred.

Table 173. Trade Allies' Reactions to Midstream Incentives

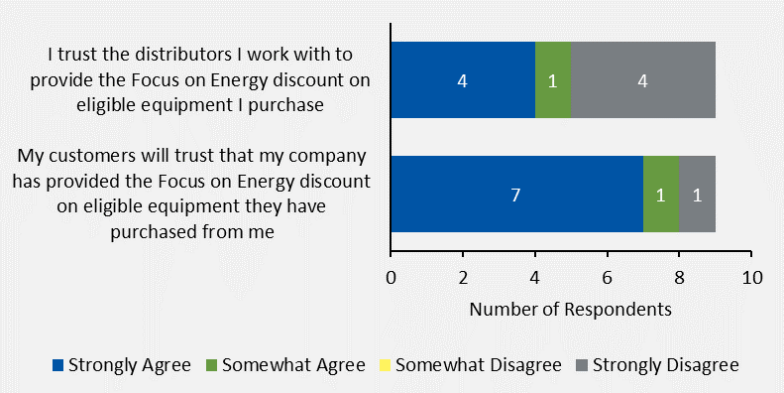
Positive (Number of Responses)	Negative (Number of Responses)
• May see an increase in energy-efficient sales (3) • Customers will not need to wait for their incentive (1) • The rebate process is simplified (1)	• The distributor may not pass down the incentive, either institutionally or by mistake (4) • The new system may be time consuming and hard to implement (3) • Because program-qualified equipment is already in stock, there is no need to change the current system (2) • Contractors may lose their competitive advantage that they currently have for connecting customers to Focus on Energy (3) • Contractors may lose business if they are not partnered with participating distributors (1) • Demand for program-qualified product could decrease if customers no longer perceive they are receiving an incentive (1)

Source: CY 2019 HVAC Trade Ally In-Depth Interviews. Question D4: "Focus on Energy is considering some program changes …What is appealing about this change? What is less appealing?" (n=10, multiple responses allowed)

Of the 10 Trade Allies, four thought their sales of efficient equipment would remain the same, two that their sales would increase, two that they would decrease, and one was not sure.

Trade Allies were split on whether they would trust their distributor to pass the discount down to the customer, but most reported that their customers would trust that their company would pass the discount on to the end user (as shown in Figure 113).

Figure 113. Trade Allies Agreement with Trust Statements



Source: CY 2019 HVAC Trade Ally In-Depth Interviews. Question D6: "To what extent do you agree with this statement? (n=9)

Of those who distrusted that distributors would pass on the discount, one thought distributors may have a hard time administering the Program (which could lead to error and higher prices), one thought the distributor would not make the effort to pass down the incentive, and one distrusted the distributor's intentions.

Eight of nine Trade Allies thought their customers would trust that their company had passed down the full incentive. The one Trade Ally who disagreed with that statement said that customer distrust is natural. When asked what key elements of the Program were needed to make it work for Trade Allies, three recommended Program regulation or audits to ensure that incentives were being passed down to customers.

Annual Results from Ongoing Participant Satisfaction Survey

Throughout CY 2019, the Evaluation Team surveyed participants to measure their satisfaction with various aspects of the Agriculture, Schools and Government Program. Respondents answered satisfaction and likelihood questions on a scale of 0 to 10, where 10 indicates the highest satisfaction or likelihood and 0 the lowest.[89]

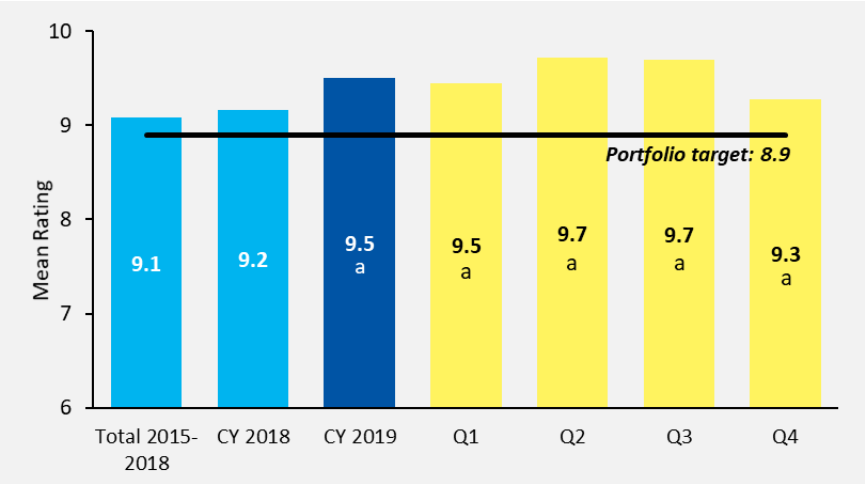
New in CY 2019, the Evaluation Team reported results separately for participants in the agribusiness sector and participants in the schools and government sector. Comparisons to CY 2018 results mentioned here are referring to the combined Program results, as sectors were not reported separately in prior years.

Figure 114 shows that average overall Program satisfaction among schools and government sector participants was 9.5 in CY 2019, which was significantly higher than the portfolio target of 8.9 and

[89] The number of participants who completed a survey does not always match the number of responses for each question, as some participants skipped questions, did not know answers to questions, or did not qualify to answer questions based on previous answers or other known data about the participant.

significantly higher than ratings from CY 2018 Agriculture, Schools and Government participants (9.2). Ratings from all four quarters were also significantly higher than the portfolio target of 8.9.[90]

Figure 114. CY 2019 Schools and Government Survey Overall Program Satisfaction

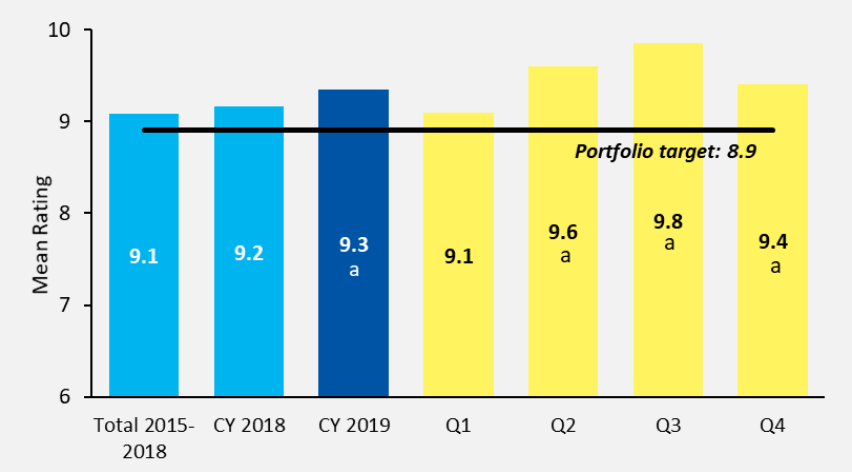


Source: Schools and Government Ongoing Participant Survey Question. "Overall, how satisfied are you with the Program?" (CY 2018 n=378, CY 2019 n=263, Q1 n=60, Q2 n=63, Q3 n=52, Q4 n=69).
Total CY 2015 to CY 2018 is the participation-weighted average of four annual results.
[a] Denotes that the result for the year or quarter is statistically significant different from the portfolio target (p<0.10 or better using binomial t-tests).

Figure 115 shows that average overall Program satisfaction was 9.3 among CY 2019 agribusiness sector participants, which was significantly higher than the portfolio target of 8.9 but statistically equivalent to average Agriculture, Schools and Government Program satisfaction ratings in CY 2018 (9.2).

[90] The Program Administrator's contract established a portfolio target of 8.9 to maintain or increase customer satisfaction. The Evaluation Team found that some survey responses did not include identifying information to match the responses to Program participation dates. The Team included survey responses without participation dates in the year-end total but not in the quarterly breakdown.

Figure 115. CY 2019 Agribusiness Survey Overall Program Satisfaction



Source: Agribusiness Ongoing Participant Survey Question. "Overall, how satisfied are you with the Program?" (CY 2018 n=378, CY 2019 n=111, Q1 n=56, Q2 n=20, Q3 n=13, Q4 n=15).

[a] Denotes that the result for the year or quarter is statistically significant different from the portfolio target (p<0.10 or better using binomial t-tests).

Table 174 shows the average schools and government survey and agribusiness survey satisfaction and likelihood ratings for CY 2019 compared to CY 2018 results from the combined Agriculture, Schools and Government survey. In CY 2019, the ratings for Schools and Government Energy Advisors (9.6), likelihood of recommending the Program (9.7), and likelihood of doing more improvements (8.6) were statistically higher than CY 2018 (9.4, 9.4, and 7.9, respectively). CY 2019 agribusiness survey respondents gave statistically higher ratings for Trade Allies (9.6) than CY 2018 survey respondents (9.2).

Table 174. CY 2019 Average Ratings for Agriculture, Schools and Government Program

Item	Agriculture, Schools and Government	Schools and Government	Agribusiness
	CY 2018	CY 2019	CY 2019
Satisfaction with Energy Advisor	9.4	9.6 [a]	9.5
Satisfaction with Trade Ally	9.2	9.4	9.6 [a]
Likelihood of more improvements	7.9	8.6 [a]	7.6
Likelihood of recommending the Program	9.4	9.7 [a]	9.5

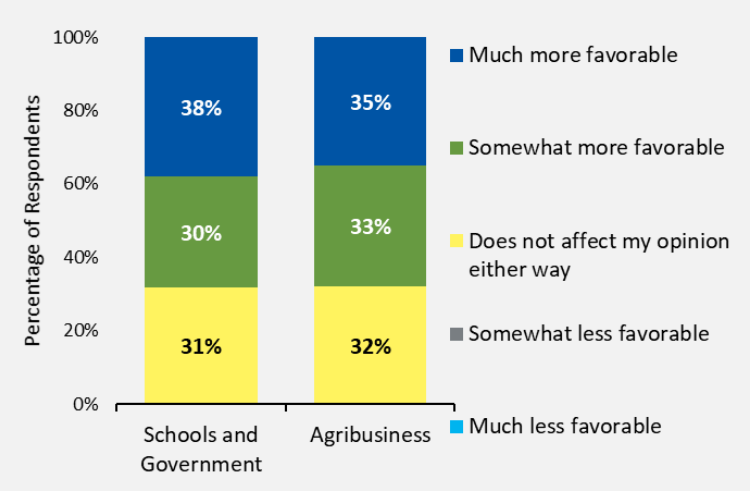
[a] This result is statistically significantly different from the result for CY 2018 (p<0.05 using a binomial t-test).

Using these survey data, the Evaluation Team calculated Net Promoter Scores (NPS) based on customers' likelihood to recommend the Program. The NPS is expressed as an absolute number between -100 and +100 that represents the difference between the percentage of promoters (respondents giving a rating of 9 or 10) and detractors (respondents giving a rating of 0 to 6). The schools and government survey NPS for CY 2019 was +90, and the agribusiness survey NPS was +87, both of which were higher than the Agriculture, Schools and Government Program's +82 NPS in CY 2018.

CY 2019 Program participants were asked if Focus on Energy offerings affected their opinion of their utilities, and more than a third gave the highest rating of *much more favorable* (38% schools and

government and 35% agribusiness, as shown in Figure 116). Another third said their opinion was not affected (31% schools and government and 32% agribusiness), and only one schools and government survey respondent reported that their opinion of their utility had become less favorable.

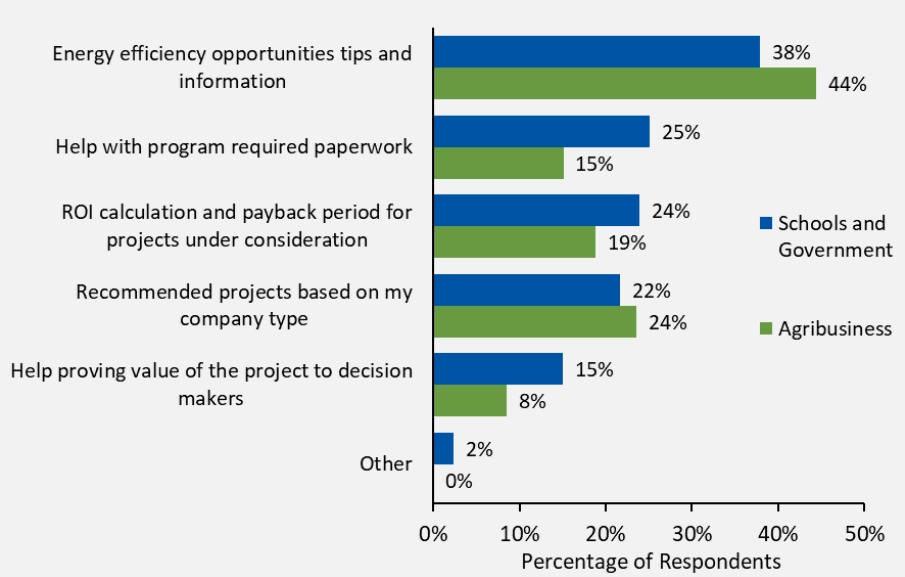
Figure 116. CY 2019 Effect of Focus on Energy Offerings on Opinion of Utilities



Source: Schools and Government Ongoing Participant Satisfaction Survey Question. "Your energy utility partners with Focus on Energy to offer energy efficiency programs to its customers. How have these offerings affected your opinion of your utility, if at all?" (n=243) Same question from Agribusiness survey (n=106).

Survey respondents identified how Focus on Energy can best support their organization with future projects (Figure 117). The most frequent responses from schools and government participants were energy efficiency opportunities, tips, and information (38%); help with Program paperwork (25%); and ROI calculations and payback periods (24%). For agribusiness survey respondents, providing energy efficiency opportunities, tips, and information was also the most common response (44%), followed by recommending projects based on company type (24%).

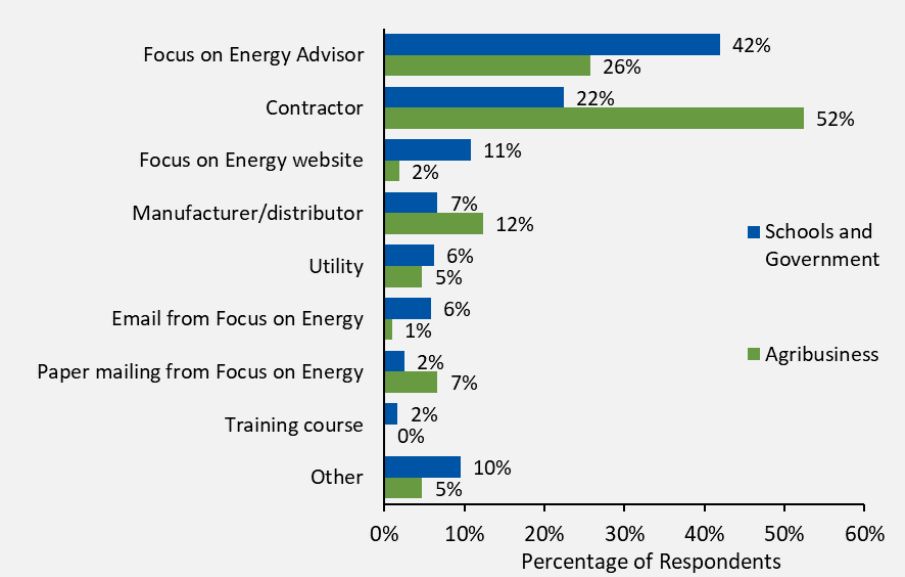
Figure 117. CY 2019 Most Valued Support



Source: Schools and Government Ongoing Participant Satisfaction Survey Question. "Aside from providing project incentive dollars, how can Focus on Energy best support your organization going forward?" (n=259). Same question from Agribusiness survey (n=106). Responses total to more than 100% because multiple responses were allowed.

Most agribusiness survey respondents learned about the Program from their contractors (52%), while the most frequent source for from schools and government respondents was their Focus on Energy advisor (42%; Figure 118).

Figure 118. CY 2019 Sources of Program Awareness



Source: Schools and Government Ongoing Participant Satisfaction Survey Question. "How did you learn about this particular opportunity from Focus on Energy?" (n=241). Same question from Agribusiness survey (n=105). Responses total to more than 100% because multiple responses were allowed.

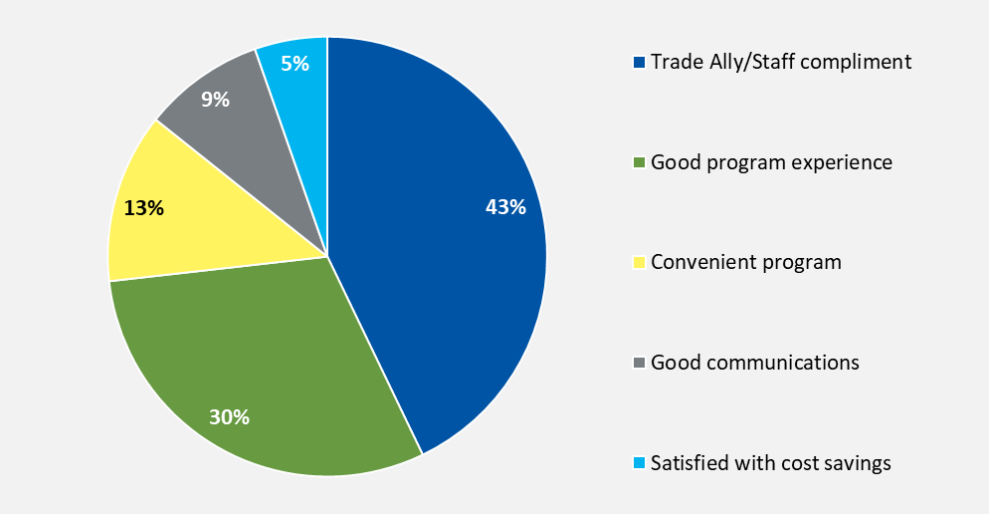
Suggestions for Improvement

During the customer satisfaction surveys, the Evaluation Team asked participants if they had any comments or suggestions for improving the Agriculture, Schools and Government Program. Of the 264 participants who responded to the schools and government survey, 21% provided open-ended feedback, which the Evaluation Team coded into a total of 66 mentions. Of these mentions, 56 were complimentary comments (85%) and 10 were suggestions for improvement (15%).

Of the 111 agribusiness survey respondents, 15% provided open-ended feedback, which the Evaluation Team coded into 19 mentions. Of these mentions, 15 were complimentary comments (79%) and four were suggestions for improvement (21%).

Schools and government respondents' positive comments are shown in Figure 119. Most of these comments were complimentary of Trade Allies and Energy Advisors (43%) or reflected a generally positive Program experience (30%), also the two most common responses in CY 2018. The most frequent positive comments from agribusiness survey respondents were also Trade Ally and Energy Advisor compliments (33%), a generally good Program experience (27%), and the convenience of participating in the Program (20%).

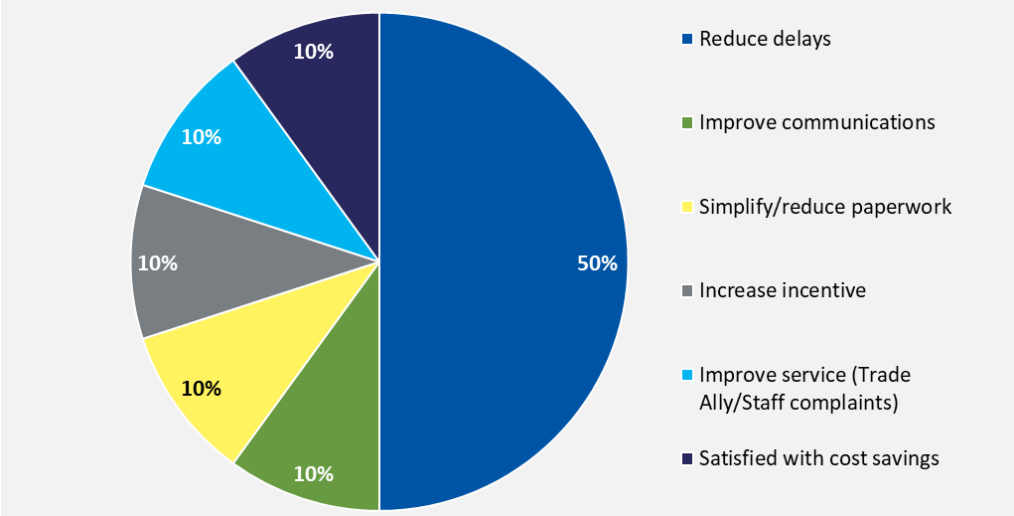
Figure 119. CY 2019 Positive Comments about the Program: Schools and Government



Source: Schools and Government Ongoing Participant Satisfaction Survey Question. "Please tell us more about your experience and any suggestions." (Total positive mentions n=56)

Figure 120 shows respondents' suggestions for improving schools and government offerings. The most frequent suggestion was to reduce delays (50%), with all other suggestion categories receiving one mention apiece (10% each). Suggestions from agribusiness survey respondents were similar, with two of their four suggestions (50%) mentioning reducing delays.

Figure 120. CY 2019 Suggestions for Improving the Program: Schools and Government



Source: Schools and Government Ongoing Participant Satisfaction Survey Question. "Please tell us more about your experience and any suggestions." (Total suggestions for improvement mentions n=10)

Program Cost-Effectiveness

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

Table 175 lists the CY 2019 incentive costs for the Agriculture, Schools and Government Program.

Table 175. Agriculture, Schools and Government Program Incentive Costs

Item	CY 2019
Incentive Costs	$9,192,951

The Evaluation Team found that the CY 2019 Agriculture, Schools and Government Program was cost-effective (2.02). Table 176 lists the evaluated costs and benefits.

Table 176. Agriculture, Schools and Government Program Costs and Benefits

Cost and Benefit Category	CY 2019
Costs	
Administration Costs	**$611,077**
Delivery Costs	**$4,378,158**
Incremental Measure Costs	$34,525,010
Total Non-Incentive Costs	**$39,514,246**
Benefits	
Electric Benefits (kWh)	$32,102,961
Electric Benefits (kW)	$16,586,707
Gas Benefits	$14,594,977
Emissions Benefits	$16,578,973
Total TRC Benefits	**$79,863,619**
Net TRC Benefits	**$40,349,373**
TRC B/C Ratio	**2.02**

Evaluation Outcomes and Recommendations

Outcome 1. Data entry errors have the potential to significantly affect impact results. One project in the impact sample had an *ex ante* demand savings that was 10 time greater than the verified *ex post* demand savings. This magnitude of error suggests this difference was caused by a data entry error by misplacing a decimal point. This was a large project with a large weight, which had the potential to significantly skew the demand kW realization rate of the sample.

Recommendation. Implement an automatic quality control function in Vision DSM to identify accidental entry of values so they may be verified and corrected. If the option is not available, it is recommended to create a tracking or quality assurance tool to detect data entry errors.

Outcome 2. The Agriculture, Schools and Government Program performed well in CY 2019, with increased participation, improved satisfaction, and strong progress toward savings goals. In CY 2019, the Program achieved 107% of its electric savings goal, 92% of its demand reduction goal, and 95% of its natural gas savings goal based on verified gross lifecycle savings. In terms of participation, the CY 2019 Program received 34% more applications than the CY 2018 Program. Average overall satisfaction was 9.5 out of 10 among CY 2019 Program participants, which was significantly higher than the portfolio target of 8.9 and significantly higher than ratings from CY 2018 participants (9.2). Average overall Program satisfaction was 9.3 among CY 2019 agribusiness participants.

Outcome 3. The Program's increased focus on agribusiness customers in CY 2019 through several program design and incentive changes was effective and helped the Program lay the groundwork for CY 2020, when agribusiness will be a stand-alone offering. The Program Administrator and Program Implementer took several steps in CY 2019 to gain more participation from agribusiness customers, including increased financial incentives and Program budget for the agriculture sector. These efforts led to the number of agriculture sector applications increasing 93% compared to CY 2018.

Outcome 4. Trade Allies are satisfied with the Program overall and find the most value from the increased sales and interaction with their Energy Advisor. Trade Allies rated their satisfaction with the program on a 5-point scale, with surveyed Trade Allies giving an average rating of 4.7 and interviewed Trade Allies giving an average satisfaction rating of 3.9. Five Trade Allies said the Program helps them to increase their sales, and five said that they appreciate the report they receive from their Energy Advisor. Schools and government Trade Allies particularly valued the Energy Advisor's role in interfacing with their customers to help move projects forward.

Outcome 5. Trade Ally training preferences were split between online and in-person training, which shows there is value in continuing to offer a variety of training formats. Trade Allies seek technical, in-depth training on certain topic areas in addition to the more general topics offered on HVAC and lighting in CY 2019. Eleven Trade Allies preferred online training, and 10 Trade Allies preferred in-person training. Most Trade Allies were satisfied with the training they attended, but they seek access to more in-depth technical training on topics such as industrial refrigeration, compressed air strategies, and a more technical waste heat recovery training.

Recommendation. Continue to offer training in both online and in-person formats to serve the greatest number of Trade Allies and consider doing some technology-specific deep dives on the topics listed above. The Program could also solicit input from Trade Allies at through its annual surveys to Trade Allies about which technical training topics they would like to see offered in the future.

Business Incentive Program

Through the Business Incentive Program, launched in CY 2012, Focus on Energy offers prescriptive and custom incentives for commercial and industrial sector customers who install energy-efficient measures. Customers not eligible for the Agriculture, Schools and Government or Large Energy Users programs may participate in the Business Incentive Program. Additionally, small business customers who are interested in a prescriptive offering not available through the Small Business Program or who have reached their annual Small Business Program incentive cap may participate in the Business Incentive Program.

APTIM serves as the Program Administrator. Franklin Energy, the Program Implementer, oversees Program management and delivery. The Program Implementer's Energy Advisors, with support from Trade Allies and the Program Administrator, promote and deliver the Program to customers.

Table 177 lists actual CY 2019 Business Incentive Program spending, savings, participation, and cost-effectiveness.

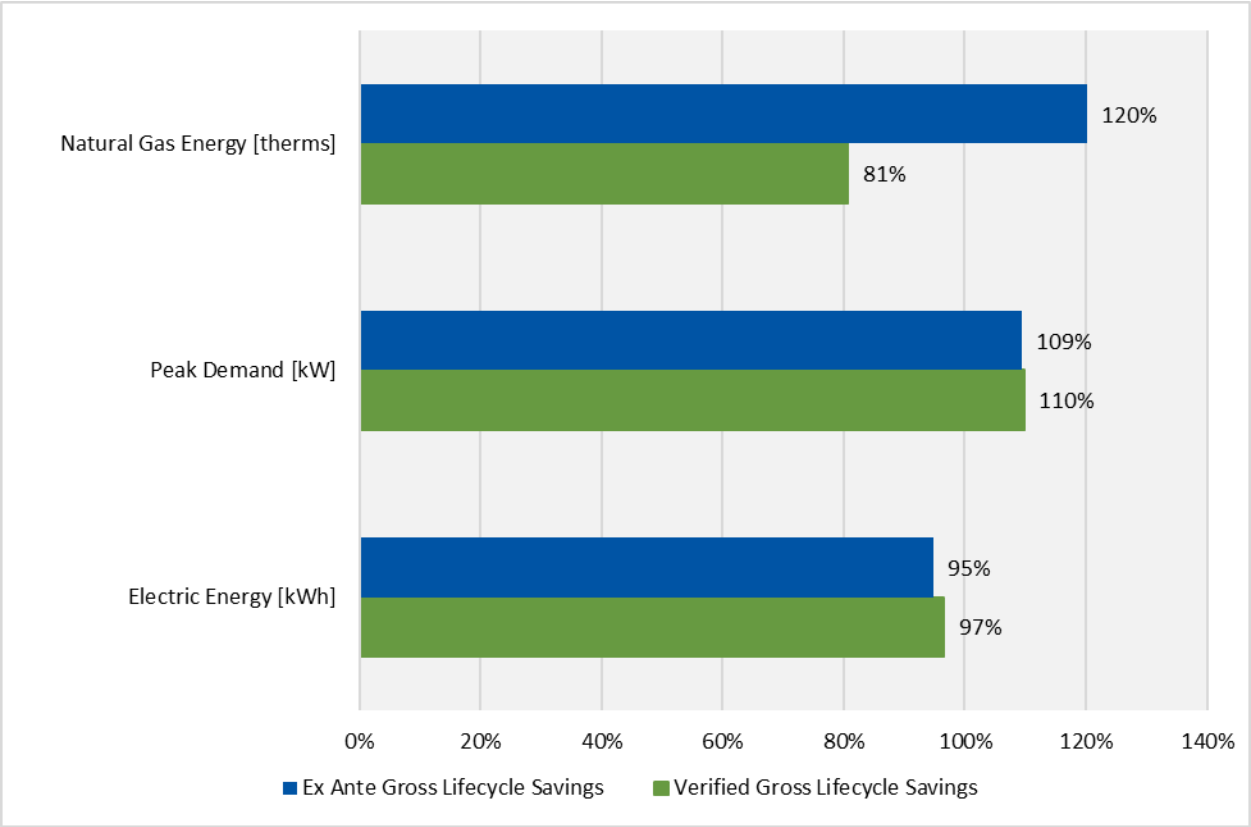
Table 177. Business Incentive Program Summary

Item	Units	CY 2018	CY 2019
Incentive Spending	$	$8,640,216	$8,494,538
Participation	Number of Participants	1,856	1,730
Verified Gross Lifecycle Savings	kWh	2,029,231,301	1,938,986,375
	kW	20,620	19,131
	therms	25,625,806	18,031,669
Verified Gross Lifecycle Realization Rate – BIP, BIP Rural Industrial, CPI	MMBtu	99%	96%
Verified Gross Lifecycle Realization Rate – MCKE	MMBtu	102%	100%
Verified Gross Lifecycle Realization Rate – MCIL	MMBtu	100%	106%
First-Year Net-to-Gross Ratio – BIP, BIP Rural Industrial, CPI	MMBtu	57%	57%
First-Year Net-to-Gross Ratio – MCKE	MMBtu	32%	32%
First-Year Net-to-Gross Ratio – MCIL	MMBtu	31%	31%
Net First-Year Savings	kWh/yr	89,795,694	82,918,886
	kW	11,777	11,030
	therms/yr	895,034	723,413
Net Lifecycle Savings	MMBtu	9,481,296	5,002,234
Cost-Effectiveness – All Inclusive	Total Resource Cost Test: Benefit/Cost Ratio	3.61	2.91
Cost-Effectiveness – MCKE	Total Resource Cost Test: Benefit/Cost Ratio	0.6	2.12
Cost-Effectiveness – MCIL	Total Resource Cost Test: Benefit/Cost Ratio	2.8	3.10

Note: CY 2019 values include BIP, BIP Rural Industrial, CPI, MCKE, and MCIL programs cumulatively. CY 2018 values include BIP, BIP Rural Industrial, and CPI programs. MCKE and MCIL were stand-alone programs in CY 2018.
BIP = Business Incentive Program
CPI = Communications Providers Initiative
MCKE = Midstream Commercial Kitchen Equipment Offering
MCIL = Midstream Commercial and Industrial Lighting Pilot

The Business Incentive Program achieved 97% of its electric savings target, 81% of its natural gas savings target, 110% of its peak demand target, and overall 97% of its total energy savings goal in CY 2019 based on verified gross lifecycle savings. Figure 121 shows the percentage of gross lifecycle savings goals achieved for the Business Incentive Program in CY 2019. (A discussion of why the program fell short on natural gas and electric savings is included in a subsequent section of this report).

Figure 121. Business Incentive Program Achievement of CY 2019 Gross Lifecycle Savings Goals



The Program Implementer is required to meet a gross lifecycle MMBtu goal in addition to fuel-specific savings targets.

Evaluation, Measurement, and Verification Approach

In CY 2019, the Evaluation Team conducted impact and process evaluations of the Business Incentive Program, designing its evaluation approach to integrate multiple perspectives in assessing Program performance. Table 178 lists specific data collection activities and sample sizes used in the Business Incentive Program evaluation.

Table 178. CY 2019 Business Incentive Program Data Collection Activities and Sample Sizes

Activity	CY 2019 Sample Size (n)
Program Actor Interviews	2
Tracking Database Review	Census
Ongoing Participant Satisfaction Surveys	331
Online Focus Groups	18
Trade Ally Surveys[a]	21
HVAC Trade Ally Interviews	10
Engineering Desk Reviews	44
Verification Site Visits	43

[a] The Program Administrator designed and administered the CY 2019 Trade Ally survey for nine residential and commercial programs. The Evaluation Team analyzed the responses of Business Incentive Program Trade Allies for this evaluation.

Program Actor Interviews

In September 2019, the Evaluation Team interviewed the Program Administrator and the Program Implementer to learn about the current state of the Business Incentive Program and to assess its objectives, performance, and implementation challenges and solutions. Additionally, the Team asked interviewees (when applicable) about their marketing, outreach, and training efforts for engaging Trade Allies and customers.

Tracking Database Review

The Evaluation Team reviewed the census of records for the Business Incentive Program in Focus on Energy's database, SPECTRUM. The review involved four tasks:

- Conduct a thorough data review to ensure that totals in SPECTRUM matched totals reported by the Program Administrator
- Reassign savings from a number of database adjustment measures to the corresponding Program measures
- Check for complete and consistent application of information across data fields (such as measure names, application of first-year savings, and application of effective useful lives)

Ongoing Participant Satisfaction Surveys

The PSC requested that the Evaluation Team conduct satisfaction surveys beginning in CY 2019 for the CY 2019–CY 2022 quadrennium, continuing the practice established for the previous quadrennium in CY 2015. There were two objectives for these satisfaction surveys:

- Understand customer satisfaction on an ongoing basis and respond to any changes in satisfaction before the end of the annual reporting schedule
- Help to facilitate timely follow-up with customers to clarify and address service concerns

The Team used SPECTRUM data to sample CY 2019 participants and administered web-based satisfaction surveys throughout the year. The Team mailed paper surveys to participants with no email address on file. The Team combined results from both modes to conduct the analysis. A total of 331

Business Incentive Program participants responded to the CY 2019 survey. The survey covered several topics, such as the following:

- Overall satisfaction
- Satisfaction with Program staff and trade allies
- Likelihood of recommending the Program
- Likelihood of initiating another energy efficiency improvement
- Open feedback regarding the Program (comments and suggestions)

Online Focus Groups

The Evaluation Team conducted four online focus groups with skilled nursing facilities and hospitals in Wisconsin. Eighteen facility managers or decision-makers took part in this qualitative research. The focus groups were segmented based on prior participation in the Business Incentive or Large Energy Users Programs.

This was a cross-cutting task across participants and nonparticipants of the two programs, so the Evaluation Team synthesized results across all respondents. See *Appendix K* for a summary of methodology and findings from this cross-cutting task.

Trade Ally Surveys

In March 2019, the Program Administrator conducted an online survey of participating Trade Allies about their satisfaction and experience with Focus on Energy. The Program Administrator stratified the sample by program and by the Trade Allies who contributed the greatest number of projects. The Program Administrator emailed the survey to 367 Trade Allies who represented the Business Incentive Program. Of these, 21 responded, for a 6% response rate. The Evaluation Team analyzed the results of the survey.

HVAC Trade Ally Interviews

In November 2019, the Evaluation Team conducted in-depth phone interviews with Trade Allies who provide Program-eligible HVAC measures to customers. The Team randomly selected a sample of 30 from a population of 85 participating Trade Allies and completed five interviews with low-volume (one project in past 12 months) Trade Allies and five interviews with high-volume (two or more projects in past 12 months) Trade Allies. These interviews represented a 33% response rate. Interview topics included Trade Ally promotion and perceived value of the Program, use of Focus-branded marketing materials, relationship with Energy Advisors, satisfaction, and reactions to midstream incentive designs.

Engineering Desk Review

The Evaluation Team reviewed all available project documentation in SPECTRUM for a sample of 44 Program measures. This review included an assessment of the savings calculations and methodology applied by the Program Implementer. The Evaluation Team relied on the applicable TRMs and other relevant secondary sources as needed. Secondary sources included energy codes and standards, case

studies, and energy efficiency program evaluations of comparable measures (based on geography, sector, measure application, and date of issue).

For prescriptive measures in Wisconsin, the Team used Focus on Energy TRM and associated workpapers as primary sources to determine methodology and data in nearly all cases. For hybrid and custom measures, the Team reviewed the SPECTRUM savings analysis workbooks and adjusted inputs and methodologies as necessary based on engineering judgment and project documentation. The Team selected the evaluation sample for these reviews using a weighted, random stratified sampling approach known as probability proportional to size (PPS), where size is based on lifecycle total energy savings.

Verification Site Visits

The Evaluation Team conducted 43 verification site visits for the CY 2019 Business Incentive Program. Site visits involved verifying the type and quantity of equipment installed, determining how the installed equipment is controlled, and documenting the operating hours of the installed equipment. The Team verified savings calculation input parameters based on operational and occupancy schedules, claimed and observed setpoints, trend data, utility data, and any other relevant details identified prior to or upon arrival at the site.

Impact Evaluation

The Evaluation Team used the following approaches to measure the impact of the Business Incentive Program:

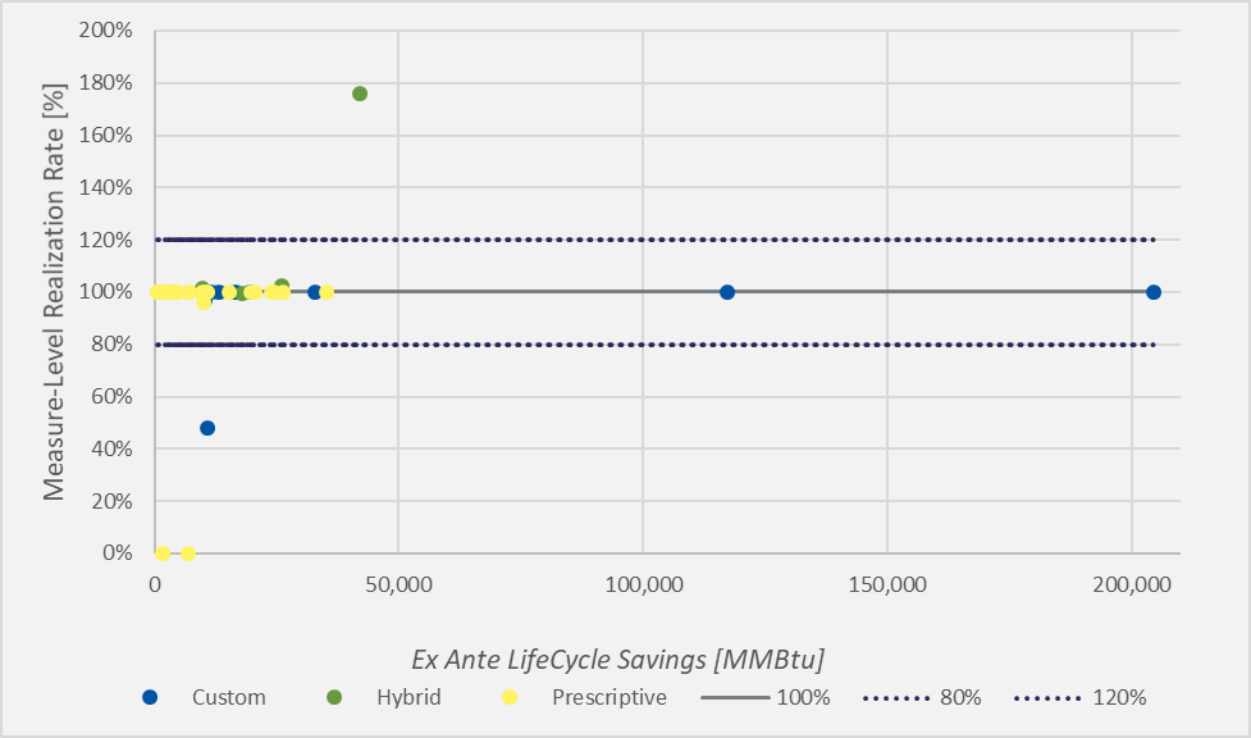
- Tracking database review
- Engineering desk reviews
- Verification site visits

Evaluation of Gross Savings

The Evaluation Team used the CY 2019 tracking data to gather reported installations, then applied the results from engineering desk reviews (n=44) and verification site visits (n=43) to determine verified gross savings. The sampled projects represent 11% of Business Incentive Program lifecycle MMBtu savings.

The Team found that the overall accounting of demand reduction and energy savings in the SPECTRUM database was generally accurate and adhered to industry best practices. SPECTRUM provides typical date fields, such as “paid date” and “application received date,” and offers several additional fields that help users track projects in greater detailed. SPECTRUM also employs unique customer identifier numbers, a best practice not followed in many other jurisdictions, so account numbers and customer contact information can be used to easily classify unique customers. Figure 122 represents the magnitude of and associated realization rates for reported MMBtu savings among sampled projects.

Figure 122. Business Incentive Program Sample Results



In general, there were very few discrepancies in realization rates among CY 2019 sampled projects. One site had a realization rate greater than 120%, and three sites had realization rates below 80%. Specific details related to these projects can be found in *Appendix H*.

Verified Gross Savings Results

Table 179 lists the first-year and lifecycle realization rates for the CY 2019 Program. Overall, the Program achieved a first-year evaluated realization rate of 97% (MMBtu). Electric demand and consumption realization rates were above 100% for both first-year and lifecycle values. The first-year and lifecycle therms realization rates were driven downward by the results of three measures at three verification site visits conducted. The realization rates for these measures were 0% to 48%. The totals presented in this report are derived using *ex ante* savings weighting of the realization rates of a sample of projects chosen using a probability proportional to size (PPS) sampling methodology.

Table 179. CY 2019 Business Incentive Program
First-Year and Lifecycle Realization Rates

Measure	First-Year Realization Rate				Lifecycle Realization Rate		
	kWh	kW	therms	MMBtu	kWh	therms	MMBtu
Total	102%	100%	71%	97%	102%	67%	96%

Table 180 lists the *ex ante* and verified first-year gross savings for the Program for CY 2019 by measure type.

Table 180. CY 2019 Business Incentive Program First-Year Gross Savings Summary

Measure	Ex Ante Gross First Year			Verified Gross First Year		
	kWh	kW	therms	kWh	kW	therms
Aeration	37,071	1.9	5,573	37,813	1.9	3,957
Air Sealing	3,430	6.5	29,624	3,499	6.5	21,033
Boiler	0	0.0	274,316	0	0.0	194,764
Chiller	335,430	32.0	0	342,139	32.0	0
Compressor	2,270,643	560.4	0	2,316,056	560.4	0
Controls	8,359,672	574.9	107,330	8,526,865	574.9	76,204
Delamping	584,596	121.4	0	596,288	121.4	0
Dishwasher, Commercial	120,408	0.3	0	122,816	0.3	0
Dryer	168,885	29.5	0	172,263	29.5	0
Energy Recovery	862,708	163.3	303,220	879,962	163.3	215,286
Fan	-3,849	0.0	15,227	-3,926	0.0	10,811
Filtration	196,879	17.7	101,733	200,817	17.7	72,230
Fryer	6,165	1.3	54,723	6,288	1.3	38,853
Furnace	93,095	17.8	49,167	94,956	17.8	34,908
Griddle	24,360	5.0	0	24,847	5.0	0
Hot Holding Cabinet	6,022	1.0	0	6,142	1.0	0
Ice Machine	15,442	1.8	0	15,751	1.8	0
Infrared Heater	0	0.0	10,327	0	0.0	7,332
Insulation	17,838	11.9	59,598	18,195	11.9	42,315
Light Emitting Diode (LED)	97,185,279	13,649.2	0	99,128,985	13,649.2	0
Motor	1,418,490	168.4	0	1,446,860	168.4	0
Nozzle	144,000	54.0	0	146,880	54.0	0
Other	11,336,203	1,318.8	532,209	11,562,927	1,318.8	377,868
Oven	51,537	11.8	17,145	52,568	11.8	12,173
Packaged Terminal Unit (PTAC, PTHP)	729,146	32.2	0	743,729	32.2	0
Pre-Rinse Sprayer	0	0.0	104	0	0.0	74
Reconfigure Equipment	760,677	127.4	0	775,891	127.4	0
Refrigerated Case Door	4,116,177	181.4	59,864	4,198,501	181.4	42,503
Refrigerator/Freezer - Commercial	106,786	12.2	0	108,922	12.2	0
Rooftop Unit/Split System A/C	789,084	557.1	69,711	804,866	557.1	49,495
Scheduling	16,927	0.0	0	17,266	0.0	0
Steam Trap	0	0.0	67,937	0	0.0	48,235
Steamer	8,481	13.0	0	8,651	13.0	0
Strip Curtain	80,955	9.3	0	82,574	9.3	0
Supporting Equipment	301,559	34.6	0	307,590	34.6	0
Tune-up/Repair/Commissioning	2,208,373	0.0	0	2,252,540	0.0	0
Variable Speed Drive	9,887,325	1,351.3	0	10,085,072	1,351.3	0
Water Heater	-150	0.0	12,763	-153	0.0	9,062
Window	0	0.0	5,950	0	0.0	4,225
Total First Year	**142,239,645**	**19,067**	**1,776,521**	**145,084,437**	**19,067**	**1,261,330**

Table 181 lists *ex ante* and verified gross lifecycle savings by measure type for the Program in CY 2019.

Table 181. CY 2019 Business Incentive Program Lifecycle Gross Savings Summary

Measure	Ex Ante Gross Lifecycle			Verified Gross Lifecycle		
	kWh	kW	therms	kWh	kW	therms
Aeration	370,711	1.9	55,727	378,125	1.9	37,337
Air Sealing	51,450	6.5	359,080	52,479	6.5	240,584
Boiler	0	0.0	5,486,316	0	0.0	3,675,832
Chiller	6,708,600	32.0	0	6,842,772	32.0	0
Compressor	34,059,634	560.4	0	34,740,827	560.4	0
Controls	85,913,304	574.9	1,134,566	87,631,570	574.9	760,159
Delamping	5,918,064	121.4	0	6,036,425	121.4	0
Dishwasher, Commercial	1,204,080	0.3	0	1,228,162	0.3	0
Dryer	2,533,277	29.5	0	2,583,943	29.5	0
Energy Recovery	12,555,010	163.3	4,391,250	12,806,110	163.3	2,942,137
Fan	-57,735	0.0	228,405	-58,890	0.0	153,031
Filtration	2,633,185	17.7	1,525,995	2,685,849	17.7	1,022,417
Fryer	73,980	1.3	656,676	75,460	1.3	439,973
Furnace	1,675,670	17.8	884,986	1,709,183	17.8	592,941
Griddle	292,320	5.0	0	298,166	5.0	0
Hot Holding Cabinet	72,264	1.0	0	73,709	1.0	0
Ice Machine	154,420	1.8	0	157,508	1.8	0
Infrared Heater	0	0.0	154,899	0	0.0	103,782
Insulation	346,288	11.9	1,054,882	353,214	11.9	706,771
Light Emitting Diode (LED)	1,321,532,778	13,649.2	0	1,347,963,434	13,649.2	0
Motor	21,353,079	168.4	0	21,780,140	168.4	0
Nozzle	2,160,000	54.0	0	2,203,200	54.0	0
Other	171,479,735	1,318.8	7,877,618	174,909,330	1,318.8	5,278,004
Oven	618,432	11.8	205,759	630,801	11.8	137,858
Packaged Terminal Unit (PTAC, PTHP)	10,937,190	32.2	0	11,155,934	32.2	0
Pre-Rinse Sprayer	0	0.0	521	0	0.0	349
Reconfigure Equipment	8,043,920	127.4	0	8,204,798	127.4	0
Refrigerated Case Door	30,360,427	181.4	897,960	30,967,636	181.4	601,633
Refrigerator/Freezer - Commercial	1,281,432	12.2	0	1,307,061	12.2	0
Rooftop Unit/Split System A/C	11,836,315	557.1	1,045,665	12,073,041	557.1	700,596
Scheduling	84,635	0.0	0	86,328	0.0	0
Steam Trap	0	0.0	407,620	0	0.0	273,105
Steamer	101,778	13.0	0	103,814	13.0	0
Strip Curtain	323,820	9.3	0	330,296	9.3	0
Supporting Equipment	5,874,420	34.6	0	5,991,908	34.6	0
Tune-up/Repair/ Commissioning	4,416,741	0.0	0	4,505,076	0.0	0
Variable Speed Drive	148,315,758	1,351.3	0	151,282,073	1,351.3	0
Water Heater	-1,500	0.0	175,895	-1,530	0.0	117,850
Window	0	0.0	119,000	0	0.0	79,730
Total Lifecycle	**1,893,223,482**	**19,067**	**26,662,819**	**1,931,087,952**	**19,067**	**17,864,089**

Evaluation of Net Savings

The Evaluation Team did not perform any new NTG evaluation activities in CY 2019 and therefore did not calculate new freeridership or spillover estimates.

Verified Net Savings Results

The Evaluation Team applied the lifecycle MMBtu weighted historical average of the CY 2015, CY 2016, and CY 2018 NTG ratios to the 2019 verified gross savings to determine the net savings for CY 2019.[91] This yielded an overall NTG estimate of 57% for the Program in CY 2019. Table 182 shows the weighted historical average NTG ratio, as well as the total first-year gross and net savings.

Table 182. Business Incentive Program Lifecycle Net Savings and NTG

Total Lifecycle Gross Verified Savings (MMBtu)	Total Lifecycle Net Savings (MMBtu)	Program NTG Ratio
8,760,922	4,993,726	57%

Table 183 shows the first-year net demand and energy impacts (kWh, kW, and therms) by measure category for the Program. The Evaluation Team attributed these savings as net of what would have occurred naturally without the presence of the Program.

Table 183. Business Incentive Program First-Year Net Savings

Measure	First-Year Net		
	kWh	kW	therms
Aeration	21,553	1.1	2,255
Air Sealing	1,994	3.7	11,989
Boiler	0	0.0	111,016
Chiller	195,019	18.2	0
Compressor	1,320,152	319.4	0
Controls	4,860,313	327.7	43,437
Delamping	339,884	69.2	0
Dishwasher, Commercial	70,005	0.2	0
Dryer	98,190	16.8	0
Energy Recovery	501,578	93.1	122,713
Fan	-2,238	0.0	6,162
Filtration	114,465	10.1	41,171
Fryer	3,584	0.7	22,146
Furnace	54,125	10.2	19,898
Griddle	14,163	2.9	0
Hot Holding Cabinet	3,501	0.6	0
Ice Machine	8,978	1.0	0
Infrared Heater	0	0.0	4,179
Insulation	10,371	6.8	24,119
Light Emitting Diode (LED)	56,503,521	7,780.0	0

[91] The Evaluation Team did not perform NTG evaluation activities in CY 2017.

Measure	First-Year Net		
	kWh	kW	therms
Motor	824,710	96.0	0
Nozzle	83,722	30.8	0
Other	6,590,868	751.7	215,385
Oven	29,964	6.7	6,939
Packaged Terminal Unit (PTAC, PTHP)	423,925	18.3	0
Pre-Rinse Sprayer	0	0.0	42
Reconfigure Equipment	442,258	72.6	0
Refrigerated Case Door	2,393,145	103.4	24,227
Refrigerator/Freezer - Commercial	62,085	7.0	0
Rooftop Unit/Split System A/C	458,773	317.5	28,212
Scheduling	9,841	0.0	0
Steam Trap	0	0.0	27,494
Steamer	4,931	7.4	0
Strip Curtain	47,067	5.3	0
Supporting Equipment	175,326	19.7	0
Tune-up/Repair/Commissioning	1,283,948	0.0	0
Variable Speed Drive	5,748,491	770.2	0
Water Heater	-87	0.0	5,165
Window	0	0.0	2,408
Total First Year	**82,698,129**	**10,868**	**718,958**

Table 184 lists the lifecycle net demand and energy impacts (kWh, kW, and therms) by measure category for the Program.

Table 184. Business Incentive Program Lifecycle Net Savings

Measure	Lifecycle Net		
	kWh	kW	therms
Aeration	215,531	1.1	21,282
Air Sealing	29,913	3.7	137,133
Boiler	0	0.0	2,095,224
Chiller	3,900,380	18.2	0
Compressor	19,802,271	319.4	0
Controls	49,949,995	327.7	433,291
Delamping	3,440,762	69.2	0
Dishwasher, Commercial	700,052	0.2	0
Dryer	1,472,847	16.8	0
Energy Recovery	7,299,483	93.1	1,677,018
Fan	-33,567	0.0	87,228
Filtration	1,530,934	10.1	582,777
Fryer	43,012	0.7	250,785
Furnace	974,235	10.2	337,976
Griddle	169,955	2.9	0
Hot Holding Cabinet	42,014	0.6	0
Ice Machine	89,780	1.0	0
Infrared Heater	0	0.0	59,156

Measure	Lifecycle Net		
	kWh	kW	therms
Insulation	201,332	6.8	402,859
Light Emitting Diode (LED)	768,339,157	7,780.0	0
Motor	12,414,680	96.0	0
Nozzle	1,255,824	30.8	0
Other	99,698,318	751.7	3,008,462
Oven	359,556	6.7	78,579
Packaged Terminal Unit (PTAC, PTHP)	6,358,882	18.3	0
Pre-Rinse Sprayer	0	0.0	199
Reconfigure Equipment	4,676,735	72.6	0
Refrigerated Case Door	17,651,552	103.4	342,931
Refrigerator/Freezer - Commercial	745,025	7.0	0
Rooftop Unit/Split System A/C	6,881,634	317.5	399,339
Scheduling	49,207	0.0	0
Steam Trap	0	0.0	155,670
Steamer	59,174	7.4	0
Strip Curtain	188,269	5.3	0
Supporting Equipment	3,415,388	19.7	0
Tune-up/Repair/Commissioning	2,567,893	0.0	0
Variable Speed Drive	86,230,782	770.2	0
Water Heater	-872	0.0	67,174
Window	0	0.0	45,446
Total Lifecycle	**1,100,720,133**	**10,868**	**10,182,531**

Process Evaluation

The CY 2019 process evaluation focused on these key Business Incentive Program topics:

- Program design, delivery, and goals
- Trade Ally satisfaction, engagement, and input on new program designs
- Participant satisfaction and experience

Program Design, Delivery, and Goals

In April 2012, Focus on Energy launched the Business Incentive Program, which offers incentives for a variety of prescriptive and custom measures. Prescriptive measures include things like lighting, HVAC, refrigeration, and compressed air. Custom incentives are offered for nonstandard projects that involve more complex technologies or changes in equipment that are different than those for a one-for-one replacement. Custom incentives are paid on the basis of estimated demand reduction and estimated first-year electric and/or natural gas savings.

The Evaluation Team interviewed key Program Administrator and Program Implementer staff to obtain an overview of the Program design and delivery process and any changes or challenges.

Program Management and Delivery Structure

Franklin Energy has implemented the Business Incentive Program since the Program's inception. A Program Manager is supported by Energy Advisors and other field staff (22 employees) who manage customer and Trade Ally relationships across the Business Incentive and Small Business programs and by operational staff who handle marketing, incentive reviews and processing, quality assurance, and general strategies.

Energy Advisors conduct outreach to prospective customers and Trade Allies in specific market sectors—commercial, industrial, and chain stores and franchises—and often coordinate with Wisconsin utility account representatives. Some Energy Advisors have subject matter or customer segment expertise (such as for lighting, mechanical technologies, food processing, and refrigeration industries). Others support different geographical regions and therefore work most closely with either rural or urban customers.

Trade Allies are a key component in delivering the Program to customers. To manage outreach efforts and resources for this large network, the Program Implementer categorizes Trade Allies with an A, B, C, or D ranking (corresponding to platinum, gold, silver, or green status at the portfolio level). Rankings are based on savings and applications delivered to the Business Incentive and Small Business programs, where A (platinum) and B (gold) signify the most active and engaged Trade Allies and D (green) signifies new Trade Allies.

National Rebate Administrators, a subset of the Trade Ally network, are third-party rebate aggregation and management companies that help clients calculate possible incentives and prioritize properties for energy efficiency projects by matching them with various utility incentive programs around the country. The Program Implementer works with National Rebate Administrators to assist national companies in completing incentive applications and navigating eligibility guidelines and advising them on program-qualifying equipment.

Program Changes

In CY 2019, Focus on Energy made several changes to the Business Incentive Program to align with changing market conditions. This section describes these changes.

Communications Provider Initiative

The Communications Providers Initiative, which offered elevated prescriptive and custom incentives to drive infrastructure updates for telephone, cable, broadband, and internet service providers in Wisconsin, was discontinued in CY 2018 with the close of the last quadrennium. During CY 2019, the Business Incentive Program honored projects that were approved in CY 2018. Any projects approved in CY 2019 were funded under standard incentive levels.

Rural Industrial Initiative

In CY 2019, Focus on Energy launched a rural industrial initiative that offered additional incentives and direct customer outreach to rural, small- to midsized industrial customers, including the below offerings:

- **Competitive incentive.** Through a request for proposal (RFP) process, Focus on Energy offered a competitive incentive to rural industrial customers that could demonstrate financial need, project benefits, and a likelihood to complete the project by December 6, 2019. The incentives covered up to 100% of the project costs. The Program Implementer launched the RFP in February and received seven eligible lighting projects, of which one was completed in CY 2019. The Program Implementer said the remaining projects were cancelled due to issues with securing financing, some opted for the Staffing Incentive instead because it offered them greater flexibility in making project changes, and one had a fire at another property that required the business to dedicate resources elsewhere.

  The Program Implementer reported a few other challenges: the five- to six-week application deadline and five-to-six month project completion deadline probably deterred customers from pursuing projects that were more complex than lighting. The Program Implementer also learned from talking with prospective leads that many had already planned their capital investments for the calendar year prior to when the RFP was released, which is typical of the industrial segment, and that the Staffing Incentive, which launched shortly after the competitive incentive RFP, likely deterred some from pursuing this offer.

- **Rural staffing incentive.** Throughout CY 2019, Focus on Energy offered up to 20% more than the standard prescriptive and custom incentives in the Business Incentive Program, and up to 100% of the project cost or $40,000, to offset the administrative costs of implementing an energy-efficient rural industrial project. Of the 32 customers who enrolled in the Staffing Incentive, 25 completed a project and received a total of $267,579 in base financial incentives and just over $53,818 in Staffing Incentives.
- **Benchmarking support.** Energy Advisors helped rural industrial customers track their energy usage, along with providing standard project-level support. No customers took advantage of this offering in CY 2019.

Incentive Updates

The Program Implementer made a few additional changes to the incentives:

- Removed the $200,000 project cap
- Increased the $400,000 annual per-customer cap to up to $500,000
- Increased the custom incentive from $0.03 per kWh to $0.04 per kWh saved, and added a bonus $0.20 incentive to the standard $0.80 per therm offering

Program Goals

The overall objective of the Business Incentive Program is to encourage businesses to purchase and install energy-efficient equipment. In CY 2019, Focus on Energy set the following savings goals for the Business Incentive Program (includes Business Incentive Program, Rural Industrial, Communications

Providers Initiative [CPI], Midstream Commercial Kitchen Equipment Offering [MCKE], and Midstream Commercial and Industrial Lighting Pilot [MCIL]):[92]

- Demand reduction of 17,425 kW
- Lifecycle electric savings of 2,006,619,900 kWh
- Lifecycle natural gas savings of 22,327,819 therms

The Business Incentive Program achieved 101% of its peak demand reduction goal, 88% of its electric savings goal, 75% of its therm savings goal, and overall 88% of its total energy savings goal (MMBtu) in CY 2019 based on verified gross lifecycle savings. In terms of participation, the CY 2019 participation for the Program increased slightly from CY 2018, but it did not approach the number of participants from CY 2015 through CY 2017 (Table 185).

Table 185. Business Incentive and Small Business Program Participation, CY 2015 to CY 2019

Year	Business Incentive Program Participants	Small Business Program Participants[1]
CY 2015	2,601	1,980
CY 2016	2,298	1,608
CY 2017	2,097	1,333
CY 2018	1,519	2,386
CY 2019	1,579	2,806

[1] Values exclude Community Small Business Offering participants.

This decline may be partially attributed to a shift of customers from the Business Incentive Program to the Small Business Program from CY 2017 to CY 2019, which was an intentional emphasis to better support the small business market. Though both programs showed declining numbers from CY 2015 through CY 2017, participation in the Small Business Program showed an 110% increase in the number of participants from CY 2017 to CY 2019.

Marketing and Outreach

In CY 2019, Focus on Energy encouraged participation in the Business Incentive Program by engaging customers, Trade Allies, and other stakeholders through its marketing and direct customer outreach efforts. The Program Administrator maintained web pages summarizing Program offerings, ways to participate, success stories, and top opportunities for specific market segments. The Program Implementer refreshed materials to support marketing plan objectives and web pages. These materials included Program summary brochures and industry-specific pieces, such as digital grocery, retail, restaurant, and lodging guides, and grocery and retail industry recognition of completion certificates to showcase facility improvements. The Program Implementer reached out directly to potential customers to provide support for project development and application processing.

[92] Metrics presented in this section represent Focus on Energy's targets for the Program, and not contractual goals for the Program Implementer. The Program Implementer is required to meet a gross lifecycle MMBtu goals in addition to fuel-specific savings targets.

Marketing to Commercial Real Estate Firms

In CY 2019, the Program Implementer developed a marketing strategy for the commercial real estate market using a market characterization study it performed in CY 2018. The study found that commercial firms use a variety of decision-making processes, timelines, lease structures, and business and energy management strategies. To successfully market energy efficiency to this segment, the Program Implementer decided to focus on local or regional firms rather than national firms and to develop an individualized outreach approach with each firm. The Program Implementer set a goal to connect with at least two commercial real estate firms and made contact with 14 firms. Seven of these firms involved an Energy Advisor in their decision-making meetings, worked with an Energy Advisor to conduct an energy analysis, or completed a program-eligible project in CY 2019.

Marketing to Trade Allies

For Trade Allies in CY 2019, the Program Implementer coordinated its Business Incentive Program marketing efforts with the Multifamily Energy Savings and Small Business programs and delivered several separate campaigns:

- It mailed individualized performance reports that show how each Trade Ally contributes to Program savings on a semiannual basis.
- It refreshed a personalized direct-mail campaign that had been conducted in CY 2018 to remind Trade Allies of their respective Energy Advisor, which in CY 2019 included a Focus-branded pencil encouraging Trade Allies to "pencil in" a meeting or phone call with Energy Advisors.
- It initiated a "win you back" campaign for inactive registered Trade Allies.
- It issued a "program champion" certificate to high-performing distributors.

Trade Ally Experience with the Program

The Evaluation Team analyzed responses for the 21 Business Incentive Program Trade Allies who completed the Program Administrator's online survey in March 2019 and the 10 HVAC Trade Allies who completed an in-depth interview with the Evaluation Team in November 2019. Topics included program experience and training opportunities. The interviews also gathered specific feedback about Trade Allies' relationships with HVAC distributors and upcoming shifts from downstream to midstream incentives for certain equipment types.

Of the 21 Trade Allies who completed the online survey, 14 provide electrical or electrical-related services through the Program, eight identified themselves as retailer/distributors, three provide refrigeration services, and one provides HVAC services (multiple responses were allowed).

Trade Allies who completed in-depth interviews provide HVAC services for the Program. At the time the sample of participating Trade Allies was pulled from the SPECTRUM database, five respondents had installed one HVAC project through the Program in the past year (identified as low volume) and five had installed at least two and as many as 15 projects (identified as high volume). Five of the 10 respondents said they deliver all HVAC products but compressed air and water heaters, while the remaining said they deliver all HVAC products and services for their customers.

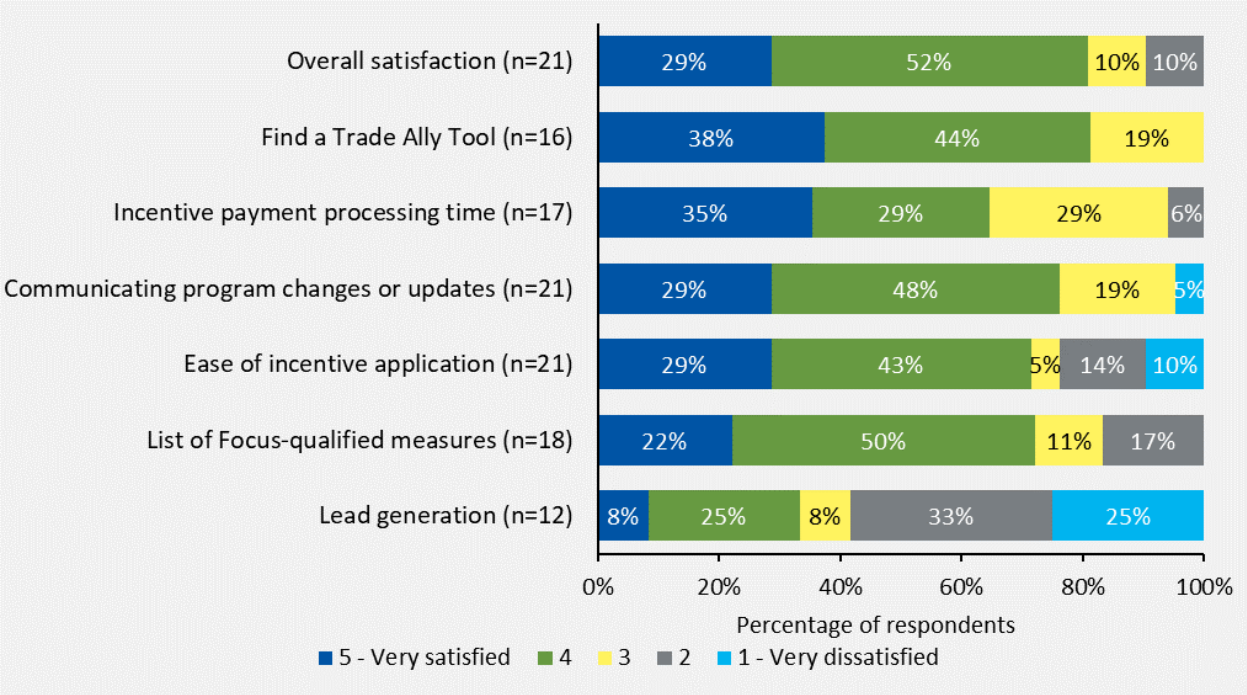
Satisfaction with the Program

The Evaluation Team asked Trade Allies to share insights about the value of the Business Incentive Program and the ways they use the Program.

Trade Ally Satisfaction with Focus on Energy

Most online survey Trade Ally respondents said they were satisfied with Focus on Energy overall. As shown in Figure 123, 81% provided a rating of 4 or 5, using a 1 to 5 scale in which 1 is *very dissatisfied* and 5 is *very satisfied*.

Figure 123. Trade Ally Satisfaction with Program Aspects



Source: CY 2019 Trade Ally Online Survey. Question: "Overall, how satisfied are you with Focus on Energy?" and "How satisfied are you with…?"

Four respondents rated their satisfaction with Focus on Energy a 2 or 3 for these reasons:

- Issues with application response time and communication (one respondent)
- Lack of understanding why the Program has more stringent requirements for its exterior lighting optimization applications (one respondent)
- Too many programs and too confusing (one respondent)
- Despite consistently sending to the same email address had issues with Focus on Energy receiving emailed applications (one respondent)

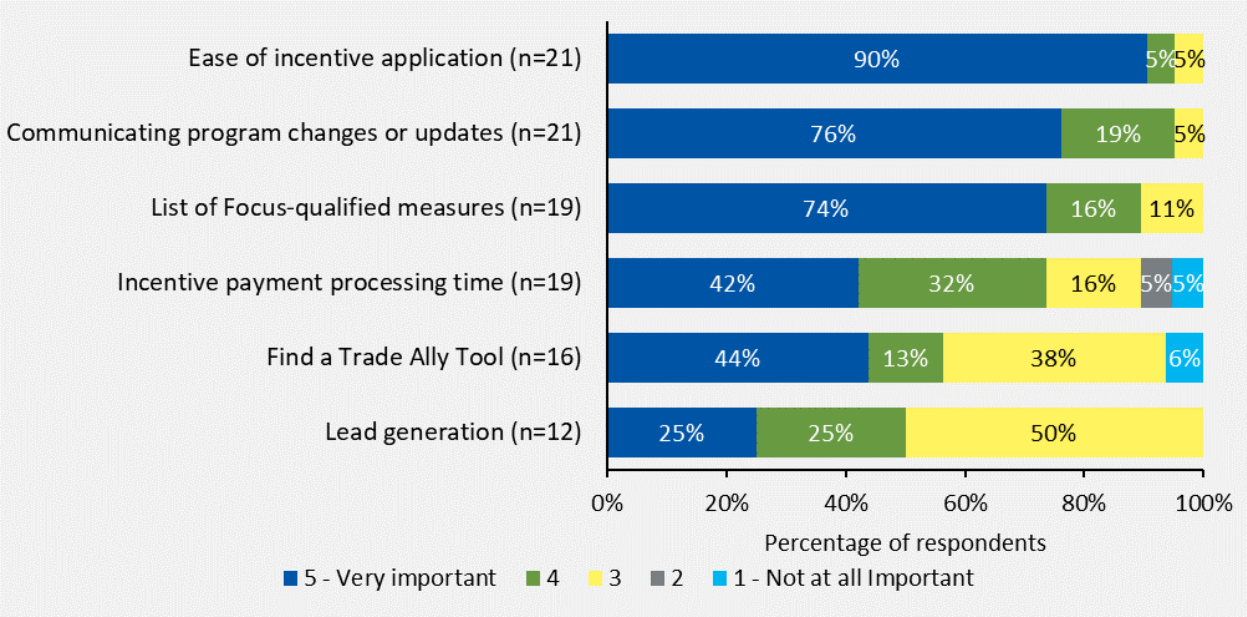
In the in-depth phone interviews, the Evaluation Team also asked about overall satisfaction and received similar positive feedback. Seven of 10 respondents rated their satisfaction as a 4 or 5 on the same scale (1 is *very dissatisfied* and 5 is *very satisfied*). The mean rating from the interviews was 4, with no ratings of 1 or 2.

In the online survey, Trade Allies rated their satisfaction with other aspects of the Program. They were most satisfied with "Find a Trade Ally Tool" and least satisfied with "lead generation." Seven of the eight respondents who rated their satisfaction with Focus on Energy's lead generation as a 1, 2, or 3 said they had never directly received leads from Focus on Energy.[93]

Trade Ally Ranking of Program Aspects

The online survey also asked questions about the importance of the program aspects. The results show there were some differences between importance and satisfaction. For example, 19 (90%) respondents reported that the ease of application was *very important* (a rating of 5), yet only six (29%) were *very satisfied*. On the other hand, survey respondents were highly satisfied with the Find a Trade Ally tool but rated this as less important than other program aspects (Figure 124.).

Figure 124. Trade Ally Importance of Program Aspects



Source: CY 2019 Trade Ally Online Survey. Question: "How important is…?"

Six of the 10 interview respondents said Focus on Energy helps them generate leads by offering incentives or listing Trade Allies on the website. Eight respondents said the Program helps them increase their company's sales in the following ways:

- Helps customer decide to move forward with an energy-efficient option, especially if the incentives cover a substantial portion of the incremental cost (three respondents)
- Provides Trade Ally with a competitive edge over firms that do not offer incentives (two respondents)

[93] It is possible that some Trade Allies misinterpreted this survey prompt, which intended to determine whether Focus on Energy generally helped with lead generation. Focus on Energy does not directly provide Trade Allies with customer leads.

- Helps Trade Ally sell more expensive equipment, which increases bottom line (two respondents)
- Helps Trade Ally verify savings calculations, providing a second opinion (one respondent)

Four respondents said Focus on Energy helps with training on equipment and technology, which encourages Trade Allies to learn new technologies and shows that only the best equipment qualifies.

When asked what value they see from interacting with their Energy Advisor, seven interview respondents (two low volume and all five high volume) said they had established relationships. They shared the following positive aspects of Energy Advisors' support:

- Advocating for a Trade Ally's project during application review (six respondents)
- Prompt communications about program changes (four respondents)
- Regular visits to the Trade Ally's business (three respondents)

Of the three low-volume respondents, two did not know their Energy Advisor and therefore saw little value, and one said an Energy Advisor had attempted connect via phone and in person but the Trade Ally was too busy to follow up.

Online Trade Ally Portal

Most Trade Ally interview respondents expressed an interest in using an online application portal if one were made available to them (six were *very likely* and three were *somewhat likely*). The one respondent whose business was *not too likely* to use an online portal said it would be difficult to navigate the process of obtaining utility account information and the customer's signature.

The online survey asked Trade Allies to rank the type of information they would find useful should an online Trade Ally Portal be made available. Respondents gave the highest rankings for incentive payment status, program updates and information, and Energy Advisor contact information (Table 186).

Table 186. Trade Ally Rankings of Online Application Portal Information Usefulness

Average Rank	Online Trade Ally Portal Information
1	Incentive application status (in-progress, approved for payment, paid)
2	Contact information for your local Energy Advisor(s)
3	Energy savings (by project) in the past 12 months
4	Focus on Energy Program updates and information
5	Incentives paid (by project) in the past 12 months
6	Incentive payment details (which projects were paid on a check)
7	Training opportunities relevant to your business

Source: CY 2019 Trade Ally Online Survey Question "If Focus on Energy were to provide your company with access to an online Trade Ally Portal, what information would you find most useful to have available? Please rank the following features in order of usefulness to you, where 1 is the MOST useful, and 7 is the LEAST useful." (n=14-19)

Trade Ally Marketing Practices

The Evaluation Team asked the 10 interview respondents about their company's marketing of Focus on Energy. When their cost proposals include incentive-eligible equipment, seven respondents said they *always* promote Focus on Energy and three said *sometimes*. The three respondents who did not promote Focus on Energy with every incentive-eligible proposal said that the project or customer eligibility criteria could be restrictive or that determining eligibility could be too time-consuming. Nine respondents said they marketed the benefits of energy-efficient equipment because of their energy savings potential and five said for their return on investment.

Seven interview respondents reported using the incentive application, incentive catalog, and/or the Focus on Energy website to market the Business Incentive Program to their customers, and two of these also mentioned talking to an Energy Advisor about project eligibility before delivering a proposal to a customer.

One respondent, a high-volume contractor, said using single-paged, Focus on Energy-branded, technology-specific flyers was effective because "it gave the customer a baseline to verify that we weren't just marketing something, that a third party [validates the energy savings]; people are nervous that it will do what we say it will do."

When asked whether the Program could benefit from additional materials, six respondents could not think of any, though three of these added that as long as they were versed in the Program offerings the customer need not know details about offerings or procedures. The remaining four respondents suggested the following:

- Provide examples of the application process and paperwork by technology (two respondents)
- Provide overviews of specialty target markets and industries, such as industrial process heat recovery (two respondents)

Most interviewed Trade Allies had no suggestions for improving the Focus on Energy website. Four noted that the website has already improved with the Program Administrator's most recent updates. One respondent requested "examples of filled-out applications with bullets and popups showing how to fill out and why the detail is needed," and another suggested separate catalogs for HVAC and plumbing measures, simplifying measure incentive codes into distinct and more logical configurations, and exchanging the colors for lines in the code tables to make the measure rows easier to read.

Trade Ally Training

In CY 2018 and CY 2019, Focus on Energy offered Trade Allies a variety of training and events covering topics across all programs. These included the Trade Ally Forum, an HVAC workshop, a Learning to Sell Energy Efficiency workshop, and access to a series of sales training online videos offered by Mark Jewell.[94] None of the interviewed Trade Allies had attended the technical or sales training or viewed any

[94] Selling Energy. "Boldly Go into the World of Mobile Learning with Selling in 6." https://www.sellingenergy.com/product-cat/selling-in-6-products/

of the sales training videos. Two Trade Allies had attended the Trade Ally Forum and rated it a 4 on a 5-point scale (where 1 was *not at all satisfied* and 5 was *extremely satisfied*). Neither of these respondents could think of any suggestions to improve the event.

All but one Trade Ally were aware of the events or trainings. When asked for the best way to receive information about upcoming trainings, all preferred email. They said time was the main barrier to attending training (five of 10, with two reporting no challenges), followed by preference for briefings from Energy Advisors (two of 10) and topic applicability (one of 10).

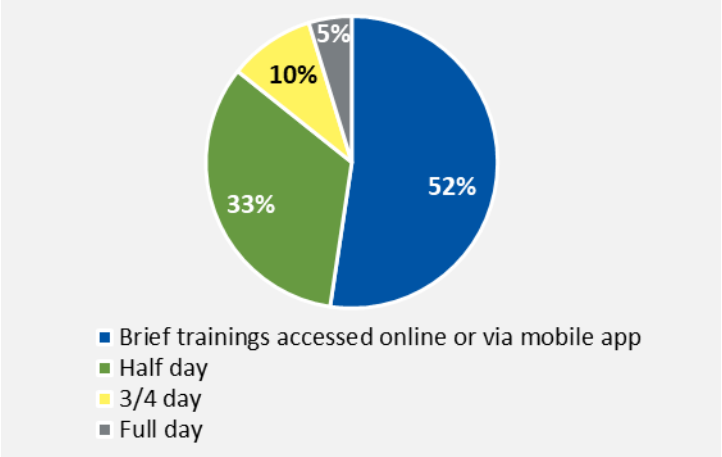
Online survey respondents were also asked what type of additional training would be most beneficial to them. Of 18 respondents, 13 favored training on navigating the Focus on Energy programs, three wanted technical training, and three wanted sales training.

Respondents of both the online survey and the interviews provided the following additional training suggestions:

- Training specific to HVAC equipment or service (rather than broadly covering HVAC), particularly about air balancing, rooftop units, boilers, heat recovery ventilators (HRVs), chillers, water heat recovery, and frequency drives (three respondents)
- Program preapproval and incentive application training, with one respondent emphasizing training that covered differences between small, medium, and large business eligibility and requirements and that defined existing conditions and building improvements/new construction (two respondents)
- Lighting and controls, with one suggesting linking health, i.e., circadian rhythms (two respondents)
- Capacitor banks (one respondent)
- Energy-efficient equipment for the small business market (one respondent)

Responses from surveyed Trade Allies varied when asked about the duration of training they would be most likely to attend. Figure 125 shows that 11 (52%) said they would be more likely to attend brief online or mobile sessions and seven (33%) would attend a half-day training.

Figure 125. Trade Ally Training Preferences



Source: CY 2019 Trade Ally Online Survey. Question: "What duration of training are you or your staff most likely to attend?" (n=21)

Similarly, four of the 10 interviewed respondents preferred online to in-person training, three preferred to attend training in person, and three had no preference. Of the seven who preferred online training or had no preference, four favored webinars, two chose access to videos, and one said both.

If committed to attend a training in person, most Trade Allies were willing to travel. Sixteen of 21 online survey respondents said they were willing to travel up to 50 miles to attend training. Three were willing to travel 51 to 100 miles, one was willing to travel 101 to 200 miles, and one was unwilling to travel for training.

Of the seven interview respondents who preferred in-person training or had no preference, four were willing to travel up to 60 minutes, while two said 100 miles or 130 miles. Training length preferences for interviewed Trade Allies were similar to survey responses: three interview respondents preferred half-day training, one preferred full-day, and three said their preference would depend on the distance traveled and content of the training.

Recommendations for Improvement

Eight interviewed Trade Allies offered suggestions for improving Focus on Energy. One suggestion—to simplify the application process—was offered by two respondents. One of these respondents clarified that the process is intimidating for a novice contractor: "Before [the Energy Advisor] came to talk to us, I had no desire to look at the catalog. It didn't make any sense to me at all, and since then we've had some customers take advantage of [the incentives]."

Other respondents provided the following requests:

- Increase incentives
- Increase awareness
- Provide more one-on-one training

- Improve application process to encourage process/energy management improvements using existing equipment
- Improve application status tracking and response times
- Deliver consistent prescriptive incentives from year to year

Input on Future Program Design and Offerings

The 10 interviewed Trade Allies gave feedback about Program incentives. When asked if they preferred increasing the base incentive and not offering any bonus or special offerings or offering limited-time bonuses, nine respondents chose increasing the base incentive. Of these respondents, six said bonus incentives do not help customers move forward because projects are budgeted and planned months or years in advance and typically take longer than the allotted bonus timeframe. Two said higher base incentives increase overall sales, two said bonus incentives are confusing, and one said the current incentives are not enough to motivate customers.

Three Trade Allies suggested opportunities to reward customers for energy-efficient projects where incentives are currently unavailable:

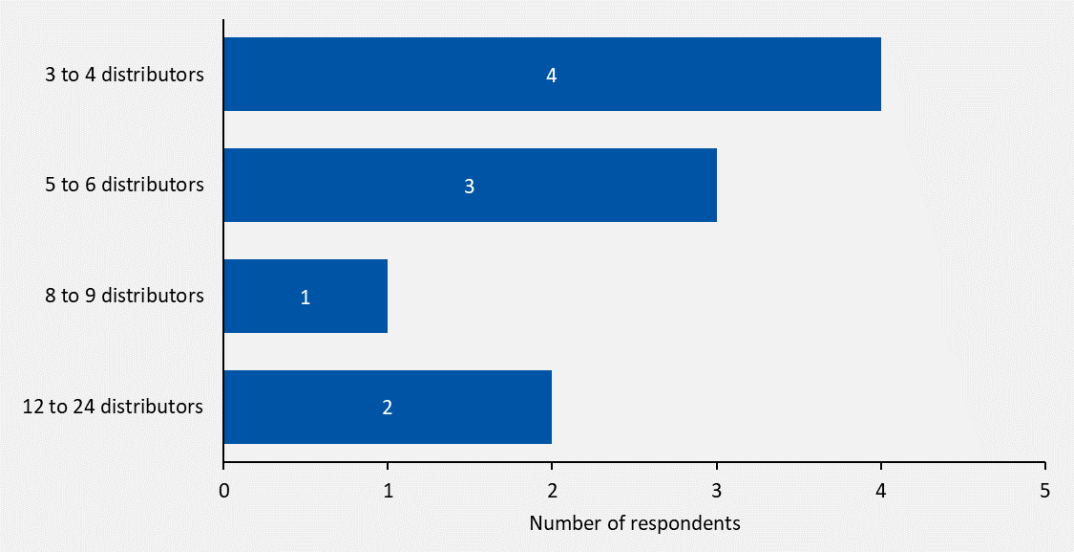
- Offer incentives for individual steam trap replacements without requiring the Trade Ally to check all of the steam valves in the facility (this Trade Ally understood the purpose of the requirement but explained that, with the labor costs to check every trap, it would be cheaper to simply replace every trap)
- Offer a lighting fixture quantity modification similar to the Small Business Program, which would be useful for larger businesses without restricting these customers to the custom incentive project eligibility criteria (particularly the minimum requirement of a 1.5-year return on investment)
- Offer smaller businesses incentives for rooftop units below five tons, residential-sized furnaces, and smart thermostats

Midstream Incentives

In CY 2020, the Program Administrator will revise the incentive delivery structure for several measures—including ECM pumps, ductless heat pumps, and heat pump water heaters—to shift the incentive payment from the contractor or customer to equipment distributors. This is known as a midstream incentive. In exchange, distributors will stock eligible equipment and discount the price of equipment to contractors, who in turn will provide site and customer utility information to the distributor.

The Evaluation Team asked interviewed Trade Allies for their impressions of this upcoming change. First, Trade Allies were asked about their relationships with distributors and with the availability of distributors' equipment. Trade Allies reported working with a range of distributors—usually three or four and up to a dozen or more, especially when dealing with specialized equipment—as shown in Figure 126.

Figure 126. HVAC Trade Allies' Distributor Network



Source: CY 2019 HVAC Trade Ally In-Depth Interviews. Question D1: "How many equipment distributors do you work with?" (n=10)

Five respondents typically worked with one or two main distributors, and five worked with several main distributors, depending on the type of project equipment needed. Five respondents said they spoke with distributors daily, and five said weekly. Seven respondents said their distributors regularly stock energy-efficient commercial equipment. Seven respondents noted that specialty items, items with unique features, and equipment such as heat exchangers, compressors, custom-built units, and larger units usually require special order.

However, eight respondents said equipment availability did not influence their promotion of energy-efficient equipment. Of the other two respondents, one said it "depends on how fast [customers] need it done," and one said that heating equipment availability is important if replaced during the heating season.

The Evaluation Team asked Trade Allies for their initial thoughts about changing the incentive delivery for certain measures to a midstream offering. They gave the pros and cons listed in Table 173. Trade Allies most commonly found the concept of a midstream offering was appealing because it could streamline the process and provide customers with an instant discount. On the other hand, they most commonly thought it would be difficult to prove that a price discount actually occurred or that not all distributors may participate because of required paperwork or the interruption of cash flow.

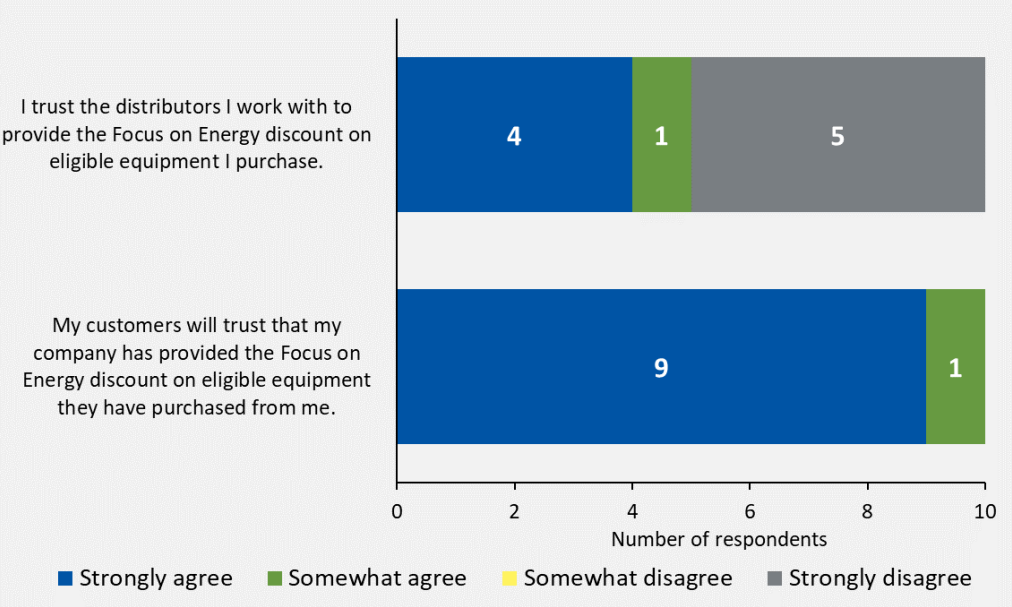
Table 187. Trade Allies' Reactions to Midstream Incentives

Positive (Number of Respondents)	Negative (Number of Respondents)
Midstream offer may streamline process/save time on paperwork for these small measures (4)	Difficult to prove that the discount was passed down to contractor and/or customer (7)
Customer can clearly see the discount on their invoice/receive an instant discount (2)	Paperwork requirements or waiting for reimbursement may be a deterrent for distributors to participate (3)
Distributors will stock eligible equipment (1)	Eligibility may be confusing if not all distributors may participate (1)
Process will increase incentive-eligible sales for these equipment types (1)	Keeping equipment in stock costs money, which could increase the overall price (1)

Source: CY 2019 HVAC Trade Ally In-Depth Interviews. Question D4: "Focus on Energy is considering some program changes …What is appealing about this change? What is less appealing?" (n=10, multiple responses allowed)

Though most interviewed respondents expressed concerns with proving that the end user received a discount, five said they trusted their distributors to pass along the discount, and all agreed that their customers trusted their company to pass along the discount to the end user, as shown in Figure 127.

Figure 127. Trade Allies' Agreement with Trust Statements



Source: CY 2019 HVAC Trade Ally In-Depth Interviews. Question D6:
"To what extent do you agree with this statement? (n=10)

Once this change in incentive payments occurs, Trade Allies preferred different ways that they would like Focus on Energy to explain the process. Several requested more than one mode:

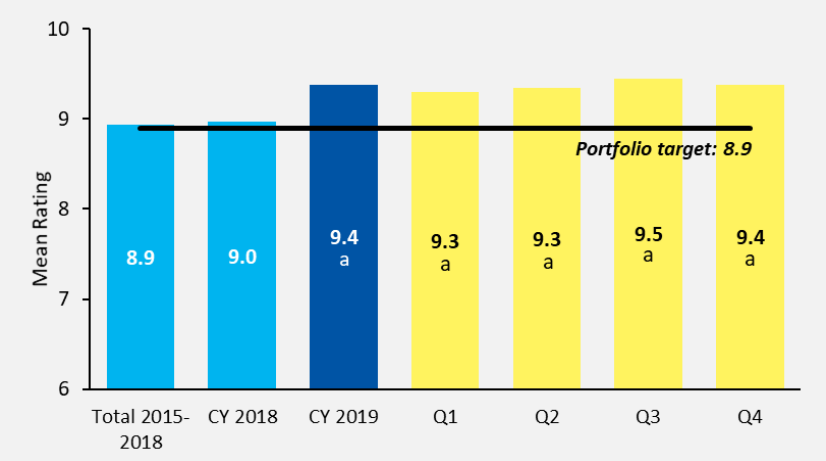
- Phone call or visit from an Energy Advisor (six respondents)
- Email (three respondents)
- Mail (two respondents)
- Focus on Energy website (one respondent)
- Participating distributor (one respondent)

Annual Results from Ongoing Participant Satisfaction Survey

Throughout CY 2019, the Evaluation Team surveyed Program participants to measure their satisfaction with various aspects of the Business Incentive Program. Respondents answered satisfaction and likelihood questions on a scale of 0 to 10, where 10 indicates the highest satisfaction or likelihood and 0 the lowest.[95]

Figure 128 shows that average overall Program satisfaction was 9.4 among CY 2019 participants, which was significantly higher than the portfolio target of 8.9 and also significantly higher than ratings from CY 2018 participants (9.0). Ratings from all four quarters were also significantly higher than the portfolio target of 8.9.[96]

Figure 128. CY 2019 Overall Business Incentive Program Satisfaction



Source: Business Incentive Program Ongoing Participant Survey Question. "Overall, how satisfied are you with the Program?" (CY 2018 n=272, CY 2019 n=331, Q1 n=57, Q2 n=79, Q3 n=84, Q4 n=87). Total CY 2015 to CY 2018 is the participation-weighted average of four annual results.
Denotes that the result for the year or quarter is statistically significant different from the portfolio target (p<0.10 or better using binomial t-tests).

Table 188 shows the average satisfaction and likelihood ratings for CY 2019 and CY 2018. In CY 2019, the ratings for Energy Advisors (9.6), Trade Allies (9.5), and likelihood of recommending the Program (9.5) were statistically higher than CY 2018 (9.3, 9.2, and 9.3, respectively).

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95 The number of participants who completed a survey does not always match the number of responses for each question, as some participants skipped questions, did not know answers to questions, or did not qualify to answer questions based on previous answers or other known data about the participant.

96 The Program Administrator's contract established a portfolio target of 8.9 to maintain or increase customer satisfaction. The Evaluation Team found that some surveys did not include identifying information to match survey responses to Program participation dates. The Team included survey responses without participation dates in the year-end total but not in the quarterly breakdown

Table 188. CY 2019 Average Ratings for Business Incentive Program

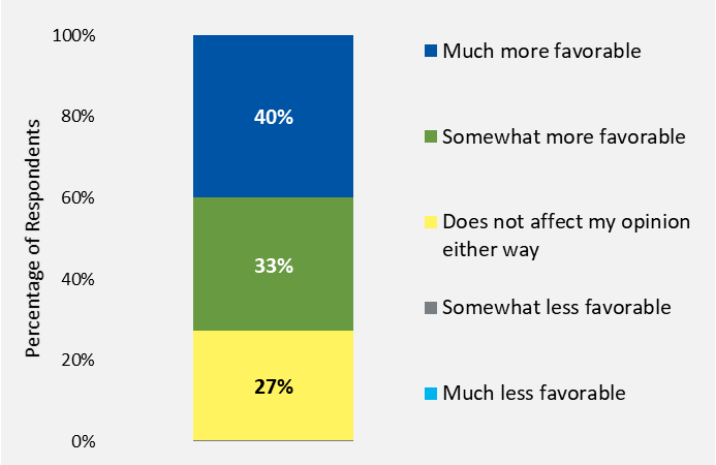
Item	CY 2018	CY 2019
Satisfaction with Energy Advisor	9.3	9.6 [a]
Satisfaction with Trade Ally	9.2	9.5 [a]
Likelihood of more improvements	7.6	7.7
Likelihood of recommending the Program	9.3	9.5 [a]

[a] This result is statistically significantly different from the result for CY 2018 ($p<0.05$ using a binomial t-test).

Using these survey data, the Evaluation Team calculated a Net Promoter Score (NPS) based on customers' likelihood to recommend the Program. The NPS is expressed as an absolute number between -100 and +100 that represents the difference between the percentage of promoters (respondents giving a rating of 9 or 10) and detractors (respondents giving a rating of 0 to 6). The Business Incentive Program's NPS was +87 for CY 2019, which was higher than the Program's +79 NPS in CY 2018.

CY 2019 Program participants were asked if Focus on Energy offerings affected their opinion of their utilities, and more than a third (40%) gave the highest rating of *much more favorable* (Figure 129). Twenty-seven percent said their opinion was not affected, and only one survey respondent reported that their opinion of their utility had become less favorable.

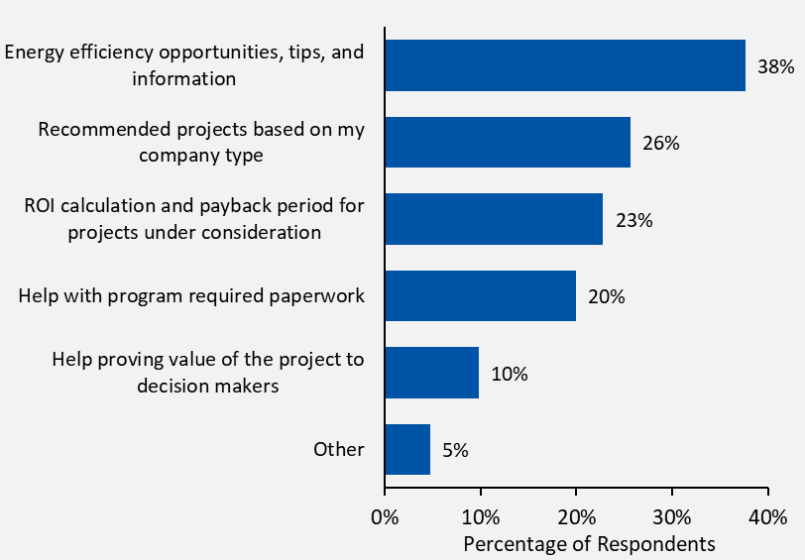
Figure 129. CY 2019 Effect of Focus on Energy Offerings on Opinion of Utilities



Source: Business Incentive Program Ongoing Participant Satisfaction Survey Question. "Your energy utility partners with Focus on Energy to offer energy efficiency programs to its customers. How have these offerings affected your opinion of your utility, if at all?" (n=305)

Survey respondents identified how Focus on Energy can best support their organization with future projects (Figure 130). The most frequent responses from Business Incentive Program participants were energy efficiency opportunities, tips, and information (38%) and project recommendations based on company type (26%).

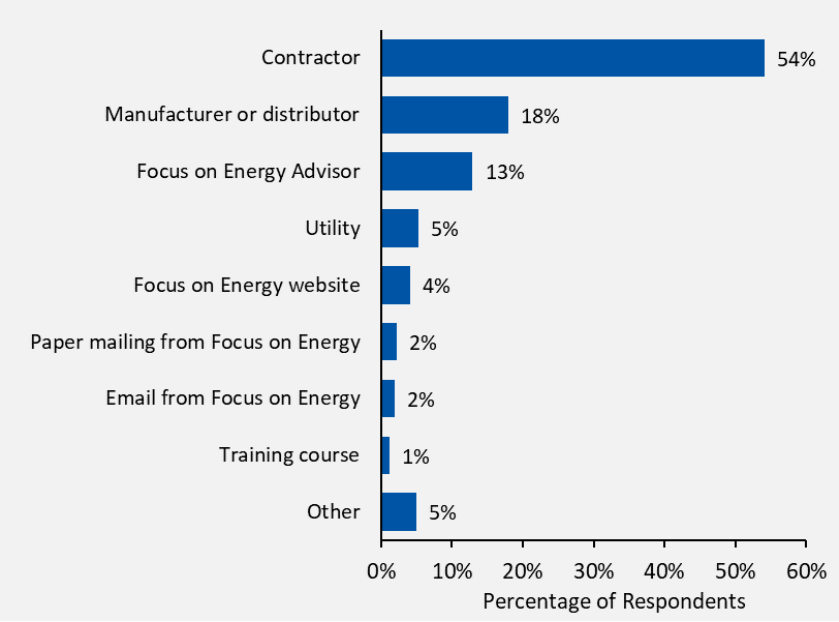
Figure 130. CY 2019 Most Valued Support for Business Incentive Program Participants



Source: Business Incentive Program Ongoing Participant Satisfaction Survey Question. "Aside from providing project incentive dollars, how can Focus on Energy best support your organization going forward?" (n=321). Responses total to more than 100% because multiple responses were allowed.

Program participants' top two sources of awareness of the Business Incentive Program were communications from their contractor (54%) and information from a manufacturer or distributor (18%), as shown in Figure 131.

Figure 131. CY 2019 Sources of Business Incentive Program Awareness



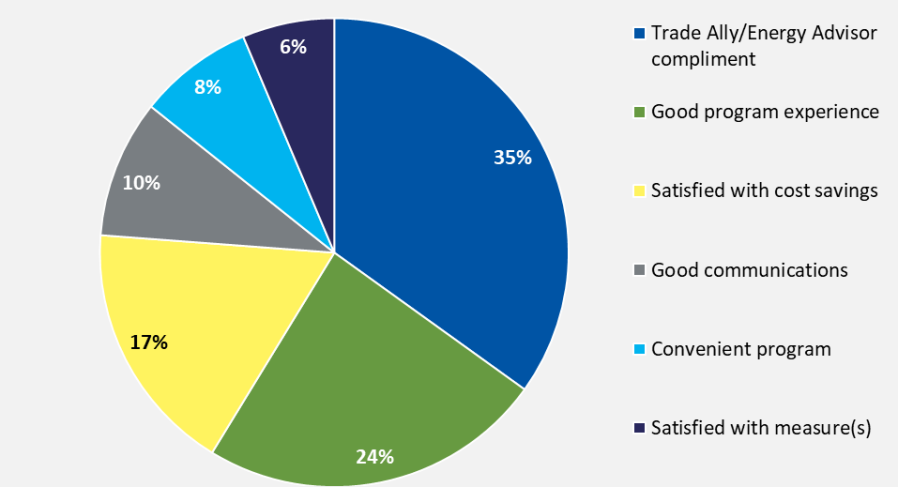
Source: Business Incentive Program Ongoing Participant Satisfaction Survey Question. "How did you learn about this particular opportunity from Focus on Energy?" (n=318). Responses total to more than 100% because multiple responses were allowed.

Suggestions for Improvement

During the customer satisfaction surveys, the Evaluation Team asked participants if they had any comments or suggestions for improving the Program. Of the 331 participants who responded to the survey, 20% provided open-ended feedback, which the Evaluation Team coded into a total of 85 mentions. Of these mentions, 63 were complimentary comments (74%) and 22 were suggestions for improvement (26%).

Respondents' positive comments are shown in Figure 132. Most of these comments were complimentary of Trade Allies and Energy Advisors (35%) or reflected a positive Program experience (24%), which were also the two most common responses in CY 2018.

Figure 132. CY 2019 Positive Comments about the Business Incentive Program

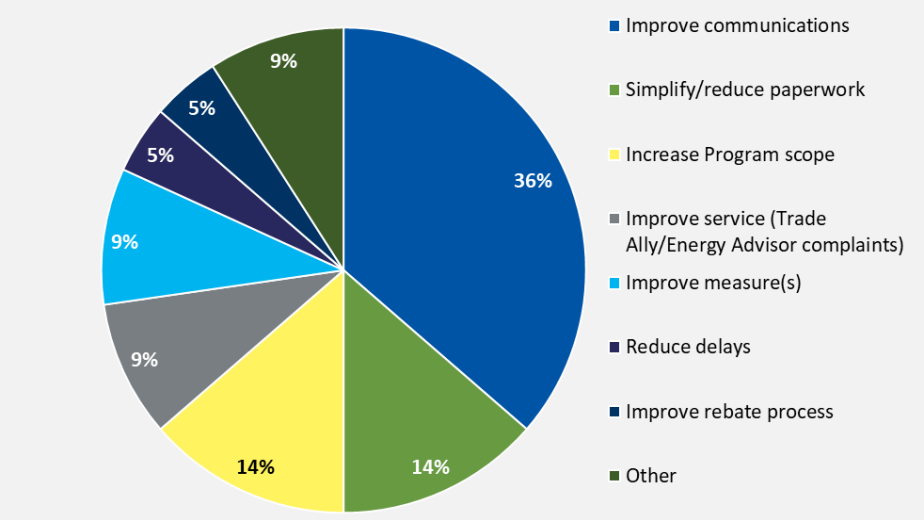


Source: Business Incentive Program Ongoing Participant Satisfaction Survey Question. "Please tell us more about your experience and any suggestions." (Total positive mentions n=63)

Figure 133 shows respondents' suggestions for improving the program. The most frequent suggestions were to improve Program communications (36% of mentions), to simplify or reduce Program paperwork (14%), and to increase the Program scope (14%), the first two of which were also the most frequent responses in CY 2018.

Several suggestions relating to Program communications mentioned challenges navigating through the incentive information on the website. Another common suggestion was that reminders about application deadlines and deadline changes could be more frequent.

Figure 133. CY 2019 Suggestions for Improving the Business Incentive Program



Source: Business Incentive Program Ongoing Participant Satisfaction Survey Question. "Please tell us more about your experience and any suggestions." (Total suggestions for improvement mentions n=22)

Program Cost-Effectiveness

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

Table 189 lists the CY 2019 incentive costs for the Business Incentive Program.

Table 189. Business Incentive Program Incentive Costs

	CY 2019
Incentive Costs	$8,494,538

The Evaluation Team found that the CY 2019 Business Incentive Program was cost-effective (2.91). Table 190 lists the evaluated costs and benefits.

Table 190. Business Incentive Program Costs and Benefits

Cost and Benefit Category	CY 2019
Costs	
Administration Costs	$231,570
Delivery Costs	$4,709,334
Incremental Measure Costs	$18,841,524
Total Non-Incentive Costs	**$23,782,428**
Benefits	
Electric Benefits (kWh)	$33,560,825
Electric Benefits (kW)	$17,343,881
Gas Benefits	$2,822,054
Emissions Benefits	$15,508,783
Total TRC Benefits	**$69,235,543**
Net TRC Benefits	**$45,453,115**
TRC B/C Ratio	**2.91**

Midstream Commercial Kitchen Equipment Offering

Focus on Energy designed the Midstream Commercial Kitchen Equipment Offering to test the feasibility of incorporating the midstream delivery channel across multiple offerings in Focus on Energy's portfolio. Through the Offering, participating distributors pass point-of-sale discounts directly to customers who purchase qualifying ENERGY STAR and Consortium for Energy Efficiency Tier II commercial kitchen equipment.

Through 2019, Franklin Energy, as the Offering Implementer, ran the Offering and worked with participating distributors in Wisconsin. Energy Advisors, assigned by the Offering Implementer, communicated with and regularly visited distributors, providing them with any needed support.

In late 2019, the Energy Advisors told distributors that Focus on Energy and the Offering Administrator had elected to transfer the Offering to a new implementer as part of a broader midstream offering that would eventually expand to include other equipment. Franklin Energy continued to work with distributors and the new implementer, ICF, to make the transition from the pilot to the expanded Midstream Offering in early 2020.

Table 191 lists actual Offering spending, savings, participation, and cost-effectiveness in CY 2019. The verified gross lifecycle savings were 30,408 MMBtu and the net annual savings were 848 MMBtu. These savings were attributed to the Business Industrial Offering total savings goal.

Table 191. CY 2019 Midstream Commercial Kitchen Equipment Offering Summary

Item	Units	CY 2018 Evaluated Savings	CY 2019 Evaluated Savings
Incentive Spending	$	$62,670	$44,350
Participation	Number of Participants	315	132
Verified Gross Lifecycle Savings	kWh	6,019,351	4,012,698
	kW	48	-
	therms	309,298	167,580
	MMBtu	51,468	30,408
Verified Gross Lifecycle Realization Rate	MMBtu (%)	102%	100%
Annual Net-to-Gross	MMBtu (%)	32%	32%
Net Annual Savings	kWh	178,642	118,037
	kW	15	45
	therms	8,309	4,455
	MMBtu	1,440	848
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	0.60	2.12

Through the Midstream Commercial Kitchen Equipment Offering, Focus on Energy seeks to achieve four overall objectives:

- Provide greater long-term, cost-effective savings for the portfolio
- Reduce Focus on Energy's administrative burden in processing commercial kitchen equipment applications
- Accelerate the market transformation of energy-efficient commercial kitchen equipment
- Increase dealers' stock of qualifying commercial kitchen equipment

Table 192 lists the available Offering incentives.

Table 192. CY 2019 Incentives Available through Midstream Commercial Kitchen Equipment Offering

Measure	Incentive
ENERGY STAR Steam Cooker	$350–$700/Unit
ENERGY STAR Fryer	$120–$250/Fry Pot
ENERGY STAR Griddle – not included this year	$30–$50/Linear Foot
ENERGY STAR Hot Holding Cabinet	$160/Cabinet
ENERGY STAR Convection Oven	$160/Oven
ENERGY STAR Combination Oven	$300–$500/Oven
ENERGY STAR Rack Oven	$300–$500/Unit
Infrared Salamander Broiler	$300/Broiler
ENERGY STAR Commercial Dishwasher	$200–$800/Unit
Consortium for Energy Efficiency Tier II Pre-Rinse Spray Valve	$25/Valve
Kitchen Hood Ventilation Controls—Temperature and Optical Sensing	$80–$600/Horsepower Controlled
Kitchen Hood Ventilation Controls—Temperature Sensing Only	$40–$200/Horsepower Controlled
Food Service Multiple Equipment Bonus, Two Types	$100
Food Service Multiple Equipment Bonus, Three Types	$300
Freezer, Vertical, Solid Door	$60–$160/Freezer
Refrigerator, Vertical, Solid Door	$40/Refrigerator
ENERGY STAR Ice Machine	$50

Table 193 shows participant counts by measure, incentive amounts, and available *ex ante* savings. This table does not include bonus incentives that are provided to Midstream Commercial Kitchen Equipment Offering distributors for carrying additional types of equipment or increasing energy-efficient sales. The Offering claimed savings of 369.21 MWh, 141.66 kW, and 13,965 therms in *ex ante* annual savings from 264 units in CY 2019.

Table 193. CY 2019 Evaluated Midstream Commercial Kitchen Equipment Offering Incentives and Gross Savings Summary

Measure	Summary Data		*Ex Ante* Gross Annual			*Ex Ante* Gross Lifecycle		
	n	Incentives	kWh	kW	therms	kWh	kW	therms
Dishwasher, Commercial	25	$7,430	204,628	0.56	0	2,046,280	0.56	0
Fryer	11	$2,490	4,110	0.84	5,661	49,320	0.84	67,932
Hot Holding Cabinet	1	$160	9,472	1.56	0	113,664	1.56	0
Ice Machine	6	$300	9,191	1.05	0	91,910	1.05	0
Oven	33	$5,760	8,332	1.92	5,844	99,992	1.92	70,129
Refrigerator/Freezer—Commercial	134	$12,820	48,478	5.53	0	581,736	5.53	0
Steam Cooker	7	$5,040	84,810	130.2	2,460	1,017,780	130.2	29,520
Bonuses	43	$10,350	-	-	-	-	-	-
Total	**260**[a]	**$44,350**	**370,190**[a]	**141.67**	**13,965**	**4,014,278**	**141.67**	**167,581**

[a] Four water-related energy savings measures were not included in this table since they did not have any incentives (and their values were already integrated into the *ex ante* savings).

Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted an impact evaluation in CY 2019 but limited the process evaluation to an interview with the Offering Administrator due to the forthcoming redesign of the offering in 2020. The Team plans to conduct a comprehensive process evaluation, including interviews with the new implementer, participating distributors, and possibly other market actors such as contractors, in 2020. Table 194 lists the specific data collection activity and sample size used in the CY 2019 evaluation.

Table 194. CY 2019 Offering Data Collection Activities and Sample Sizes

Activity	CY 2019 Sample Size (n)
Offering Actor Interviews	1
Tracking Database Review	Census

Administrator Interview

In December 2019, the Evaluation Team interviewed the Offering Administrator about the current Offering and the forthcoming redesign and transition to a new implementer.

Tracking Database Review

The Evaluation Team reviewed the Midstream Commercial Kitchen Equipment Offering data contained in SPECTRUM, the Focus on Energy database, for appropriate and consistent application of unit-level savings and effective useful life (EUL) in adherence with the TRM or other deemed savings sources.

Impact Evaluation

This section provides findings from the impact evaluation. To calculate gross savings, the Evaluation Team reviewed the Offering tracking data provided by the Offering Implementer then combined these data with results from the 2018 participant surveys. The Evaluation Team applied 2018 NTG values to 2019 Gross savings.

Verified Savings Results and Realization Rates

Table 195 lists the CY 2019 evaluated *ex post* verified savings for the Midstream Commercial Kitchen Equipment Offering.

Table 195. CY 2019 Evaluated Midstream Commercial Kitchen Equipment Offering *Ex Post* Annual Verified Savings

Measure	kWh	kW	Therms	MMBtu
Dishwasher, Commercial	204,628	0.56	0	698
Fryer	4,110	0.84	5,661	580
Hot Holding Cabinet	9,472	1.56	0	32
Ice Machine	9,191	1.05	0	31
Oven	9,334	2.33	5,844	613
Refrigerator/Freezer—Commercial	48,478	5.54	0	165
Steam Cooker	84,810	130.2	2,460	536
Total	**370,023**	**142.08**	**13,965**	**2,656**

Table 196 lists the Offering's annual realization rates. Overall, the Offering achieved a first-year evaluated realization rate of 100%, weighted by total (MMBtu) energy savings. The total represents a weighted average realization rate for the entire Offering.

Table 196. CY 2019 Evaluated Midstream Commercial Kitchen Equipment Offering Realization Rates

Offering	kWh	kW	Therms	MMBtu
Dishwasher, Commercial	100%	100%	-	100%
Fryer	100%	100%	100%	100%
Hot Holding Cabinet	100%	100%	-	100%
Ice Machine	100%	100%	-	100%
Oven	100%	100%	100%	100%
Refrigerator/Freezer—Commercial	100%	100%		100%
Steam Cooker	100%	100%	100%	100%
Total	**100%**	**100%**	**100%**	**100%**

The Evaluation Team found that the implementer was using appropriate inputs for every measure category, resulting in consistent realization rates of 100%. The team found no substantial differences between *ex ante* and *ex post* savings estimates that could not be explained by rounding.

Evaluation of Net Savings

To calculate the Offering's NTG, the Evaluation Team combined the self-reported freeridership and spillover results from CY 2018 using the following equation:

$$NTG = 1 - (Freeridership + Participant\ Spillover)$$

This yielded an overall NTG estimate of 32% for the Offering. Table 197 shows the annual Offering net demand and energy impacts. The Evaluation Team attributed these savings as net of what would have occurred naturally in the absence of the Offering.

Table 197. CY 2019 Evaluated Midstream Commercial Kitchen Equipment Offering Annual Net Savings

Measure Category	Annual Net Savings			
	kWh	kW	therms	MMBtu
Midstream Commercial Kitchen Equipment Offering	118,037	45.32	4,455	848

Table 198 lists the lifecycle Offering net demand and energy impacts.

Table 198. CY 2019 Evaluated Midstream Commercial Kitchen Equipment Offering Lifecycle Net Savings

Measure Category	Lifecycle Net			
	kWh	kW	therms	MMBtu
Midstream Commercial Kitchen Equipment Offering	1,280,051	45.32	53,458	4,354

Process Evaluation

Midstream Commercial Kitchen Equipment Offering Delivery

The Evaluation Team interviewed the Offering Administrator about the offering's performance in 2019 and the plans for its transition in 2020. The Offering Administrator reported that in 2019 all enrolled distributors participated (unlike in 2018 when some had still not reported any offering sales), but some of these distributors still reported few sales. The Offering Administrator noted that there were still ample downstream rebate applications for equipment purchased through distributors with few midstream sales. The Offering Administrator expects that the elimination of downstream rebates in 2020 will help boost sales through the midstream channel.

Because of the planned transition, the Offering Administrator and Offering Implementer did not make any substantial changes to the offering in 2019 nor attempt to recruit additional distributors.

Program Cost-Effectiveness

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

Table 199 lists the CY 2019 incentive costs for the Midstream Commercial Kitchen Equipment Offering.

Table 199. Midstream Commercial Kitchen Equipment Offering Incentive Costs

	CY 2019
Incentive Costs	$44,350

The Evaluation Team found that the CY 2019 Midstream Commercial Kitchen Equipment Offering was cost-effective (2.12). Table 200 lists the evaluated costs and benefits.

Table 200. Midstream Commercial Kitchen Equipment Offering Costs and Benefits

Cost and Benefit Category	CY 2019
Costs	
Administration Costs	$0
Delivery Costs	$0
Incremental Measure Costs	$55,904
Total Non-Incentive Costs	**$55,904**
Benefits	
Electric Benefits	$29,263
Gas Benefits	$68,082
Emissions Benefits	$0
Total TRC Benefits	$21,048
Net TRC Benefits	**$118,394**
TRC B/C Ratio	**2.12**

Midstream Commercial and Industrial Lighting

Focus on Energy designed the Midstream Commercial and Industrial Lighting Pilot to test the feasibility of incorporating the midstream delivery channel across multiple programs in Focus on Energy's portfolio. Through the Program, participating distributors pass point-of-sale discounts directly to customers who purchase qualifying ENERGY STAR and Consortium for Energy Efficiency Tier II commercial lighting.

Focus on Energy launched the Midstream Commercial and Industrial Lighting Pilot in CY 2017. APTIM is the Program Administrator and helped design the Program.

Through 2019, Franklin Energy, as the Program Implementer, ran the Program and worked with participating distributors in Wisconsin. Energy Advisors, assigned by the Program Implementer, communicated and regularly visited distributors, providing them with any needed support.

In late 2019, the Energy Advisors told distributors that Focus on Energy and the Program Administrator had elected to transfer the Program to a new implementer as part of a broader midstream offering that would eventually expand to include other equipment. Franklin Energy continued to work with distributors and the new implementer, ICF, to make the transition from the pilot program to an expanded program in early 2020.

Table 201 lists actual Program spending, savings, participation, and cost-effectiveness in CY 2019. The verified gross lifecycle savings were 3,885,725 kWh and the net annual savings were 102,719 kWh.

Table 201. CY 2019 Midstream Commercial and Industrial Lighting Pilot Summary

Item	Units	CY 2018 Evaluated Savings	CY 2019 Evaluated Savings
Incentive Spending	$	$20,774	$18,104
Participation	Number of Participants	8,903	19
Verified Gross Lifecycle Savings	kWh	2	3,885,725
	kW	5,577,825	64
	therms	88	-
	MMBtu	19,032	13,258
Verified Gross Lifecycle Realization Rate	kWh (%)	100%	106.06%
Annual Net-to-Gross	MMBtu (%)	31%	31.34%
Net Annual Savings	kWh	135,735	102,719
	kW	27	20
	therms	0	-
	MMBtu	463	350
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	2.8	3.1

Through the Midstream Commercial and Industrial Lighting Pilot, Focus on Energy seeks to achieve four overall objectives:

- Provide greater long-term, cost-effective savings for the portfolio
- Reduce Focus on Energy's administrative burden in processing commercial lighting equipment applications
- Accelerate the market transformation of energy-efficient commercial kitchen equipment
- Increase dealers' stock of qualifying commercial kitchen equipment

Table 202 lists the available Program incentives.

Table 202. CY 2019 Incentives Available through Midstream Commercial and Industrial Lighting Pilot

Measure	Incentive
LED Troffer, 2x4	Varies
LED Replacements	Varies
Bonus	varies

Table 203 shows participant counts by measure, incentive amounts, and available *ex ante* savings. This table does not include bonus incentives that are provided to Midstream Commercial and Industrial Lighting Pilot distributors for carrying additional types of equipment or increasing energy-efficient sales. The Program claimed savings of 309,046 kWh and 64 kW in *ex ante* annual savings from 4,227 units in CY 2019.

Table 203. CY 2019 Evaluated Midstream Commercial and Industrial Lighting Pilot Incentives and Gross Savings Summary

Measure	Summary Data		*Ex Ante* Gross Annual		*Ex Ante* Gross Lifecycle	
	n	Incentives	kWh	kW	kWh	kW
LED Troffer, Commercial	320	8,000	64,960	13.44	909,440	13.44
LED Troffer, Industrial	13	325	3,367	0.546	47,138	0.546
LED Troffer, Schools & Government	12	360	2,124	0.4188	29,736	0.4188
LED Fixture, Commercial	10	100	1,000	0.206	11,000	0.206
LED Replacement T8, existing ballast, Commercial	2,620	3,930	91,700	19.126	1,008,700	19.126
LED Replacement T8, existing ballast, Industrial	50	75	2,250	0.365	24,750	0.365
LED Replacement T8, direct wire, Commercial	20	40	720	0.148	10,800	0.148
LED Replacement T8, direct wire, Industrial	50	100	2,300	0.37	34,500	0.37
Bonus, Commercial	7	2,361.38	0	0	0	0
LED Replacement, Commercial	1,125	2,812.5	140,625	29.025	1,546,875	29.025
Total	**4,227**	**18,104**	**309,046**	**64**	**3,622,939**	**64**

Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted an impact evaluation in CY 2019 but limited the process evaluation to an interview with the Program Administrator due to the forthcoming redesign of the program in 2020. Table 204 lists the specific data collection activity and sample size used in the CY 2019 evaluation.

Table 204. CY 2019 Program Data Collection Activities and Sample Sizes

Activity	CY 2019 Sample Size (n)
Tracking Database Review	Census

Tracking Database Review

The Evaluation Team reviewed the Midstream Commercial and Industrial Lighting Pilot data contained in SPECTRUM, the Focus on Energy database, for appropriate and consistent application of unit-level savings and effective useful life (EUL) in adherence with the TRM or other deemed savings sources.

Impact Evaluation

This section provides findings from the impact evaluation. To calculate gross savings, the Evaluation Team reviewed the Program tracking data provided by the Program Implementer then combined these data with results from the 2018 participant surveys. The Evaluation team applied 2018 NTG values to 2019 Gross savings.

Verified Savings Results and Realization Rates

Table 205 lists the CY 2019 evaluated *ex post* verified savings for the Midstream Commercial and Industrial Lighting Pilot.

Table 205. CY 2019 Evaluated Midstream Commercial and Industrial Lighting Pilot *Ex Post* Annual Verified Savings

Measure	kWh	kW	MMBtu
LED Troffer, Commercial	82,880	13	283
LED Troffer, Industrial	3,367	0.55	11
LED Troffer, Schools & Government	3,108	0.50	11
LED Fixture, Commercial	830	0.16	3
LED Replacement T8, existing ballast, Commercial	91,700	196	313
LED Replacement T8, existing ballast, Industrial	2,250	0.37	8
LED Replacement T8, direct wire, Commercial	720	0.15	2
LED Replacement T8, direct wire, Industrial	2,300	0.37	8
Bonus, Commercial	0	0	0
LED Replacement, Commercial	140,625	29	480
Total	**327,780**	**64**	**1,118**

Table 206 lists the Program's annual realization rates. Overall, the Program achieved a first-year evaluated realization rate of 100%, weighted by total (kWh) energy savings. The total represents a weighted average realization rate for the entire Program.

Table 206. CY 2019 Evaluated Midstream Commercial and Industrial Lighting Pilot Realization Rates

Program	kWh	kW
LED Troffer, Commercial	128%	100%
LED Troffer, Industrial	100%	100%
LED Troffer, Schools & Government	146%	120%
LED Fixture, Commercial	83%	80%
LED Replacement T8, existing ballast, Commercial	100%	100%
LED Replacement T8, existing ballast, Industrial	100%	100%
LED Replacement T8, direct wire, Commercial	100%	100%
LED Replacement T8, direct wire, Industrial	100%	100%
Bonus, Commercial	N/A	N/A
LED Replacement, Commercial	100%	100%
Total	**106%**	**100%**

Evaluation of Net Savings

To calculate the Program's NTG, the Evaluation Team combined the self-reported freeridership and spillover results from CY 2018 using the following equation:

$$NTG = 1 - (Freeridership + Participant\ Spillover)$$

This yielded an overall NTG estimate of 32% for the Program. Table 207 shows the annual Program net demand and energy impacts. The Evaluation Team attributed these savings as net of what would have occurred naturally in the absence of the Program.

Table 207. CY 2018 Evaluated Midstream Commercial and Industrial Lighting Pilot Annual Net Savings

Measure Category	Annual Net Savings			
	kWh	kW	therms	MMBtu
Midstream Commercial and Industrial Lighting Pilot	118,037	45.32	4,455	848

Table 208 lists the lifecycle Program net demand and energy impacts.

Table 208. CY 2018 Evaluated Midstream Commercial and Industrial Lighting Pilot Lifecycle Net Savings

Measure Category	Lifecycle Net			
	kWh	kW	therms	MMBtu
Midstream Commercial and Industrial Lighting Pilot	1,280,051	45.32	53,473	4,354

Program Cost-Effectiveness

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

Table 209 lists the CY 2019 incentive costs for the Midstream Commercial and Industrial Lighting Pilot.

Table 209. Midstream Commercial and Industrial Lighting Pilot Incentive Costs

	CY 2019
Incentive Costs	$18,104

The Evaluation Team found that the CY 2019 Midstream Commercial and Industrial Lighting Pilot was cost-effective (3.10). Table 210 lists the evaluated costs and benefits.

Table 210. Midstream Commercial and Industrial Lighting Pilot Costs and Benefits

Cost and Benefit Category	CY 2019
Costs	
Administration Costs	$0
Delivery Costs	$0
Incremental Measure Costs	$29,106
Total Non-Incentive Costs	**$29,106**
Benefits	
Electric Benefits	$43,428
Gas Benefits	$31,531
Emissions Benefits	$0
Total TRC Benefits	$15,157
Net TRC Benefits	**$90,115**
TRC B/C Ratio	**3.10**

Evaluation Outcomes and Recommendations

Outcome 1. Though the evaluation did not find systemic issues with project approval or *ex ante* savings calculations, changes in installed equipment resulted in lowered verified natural gas savings. Through desk reviews and site visits, the Evaluation Team concluded that the Program is calculating savings according to the TRM values, and that overall, equipment was installed and operational in accordance with savings estimated from approved application except in a few cases. However, these few instances had a large impact on natural gas savings for the program.

Recommendation. For a variety of reasons, planned equipment selections can often change from application to installation. We would recommend adding an additional point of quality control check to confirm the final, purchased equipment has been specified. Additionally, we would recommend an additional point of quality control check to alert the Program Implementer reviewing the application for any perceived redundancy in equipment purchases.

Outcome 2. The Business Incentive Program performed well, with the number of participants growing slightly over 2018. Participant satisfaction exceeded previous years and the portfolio target. However, the number of participants remained low, and the Program did not meet its gross electric savings or natural gas target. The Program achieved 97% of its electric savings goal, 81% of its therm savings goal, 110% of its peak demand reduction goal, and overall 97% of its total energy saving goal in CY 2019. CY 2019 satisfaction ratings for Energy Advisors, Trade Allies, and the program overall were very strong (well over the 9.0 portfolio goal) and statistically higher than CY 2018, as was the rating for likelihood of recommending the program. The Program only realized a slight increase in the number of participants over CY 2018, which contributed to the shortfall in the electric savings goal, in addition to the underutilized incentive budgets designated for rural and communication provider initiatives. The shortfall in therms was related to project level realization rates and not participation.

Outcome 3. Trade Allies credit established relationships with Energy Advisors with their engagement with the Program. All five high-volume and two of the five low-volume Trade Allies interviewed noted having a connection to an Energy Advisor. Trade Allies who were familiar with their Energy Advisor acknowledged the relationship as integral to their Program participation levels, crediting Energy Advisors with serving as an advocate during application review and providing a strong line of regular communication and support. These relationships instill confidence in the Trade Ally network to promote the Program to their customers.

Design Assistance Program

Through the Design Assistance Program, Focus on Energy provides incentives to participating customers and their design teams to design and build new energy-efficient buildings or to complete substantial renovations of existing buildings. The Program, launched in January 2013, targets new construction projects as well as major renovation projects of 5,000 square feet or more.

The Program serves two market segments using the same consulting approach and tools (whole-building energy analysis). The Design Assistance Program serves commercial and industrial buildings and Design Assistance – Residential serves multifamily buildings larger than 5,000 square feet that have four or more residential units.

The Program Implementer, Willdan, with support from the Program Administrator, APTIM, conducts direct outreach to design professionals, such as architects, engineers, and design contractors.

Design Assistance projects consist of two types of measures that represent the initial (design and modeling assistance) and final (project savings verification) phases of each project. Each project is initiated with the design and modeling assistance measure, in which the Program Implementer and the project design team evaluate potential energy-saving design strategies and select a bundle of strategies for inclusion in the project design. After building construction is completed, the Program Implementer verifies the execution of the energy-saving strategies, and all savings are associated with the subsequent project savings verification measure. Design and modeling assistance measures are effectively excluded from the impact evaluation because they do not have any associated energy savings.

Table 211 lists actual Program spending, savings, participation, and cost-effectiveness in CY 2019.

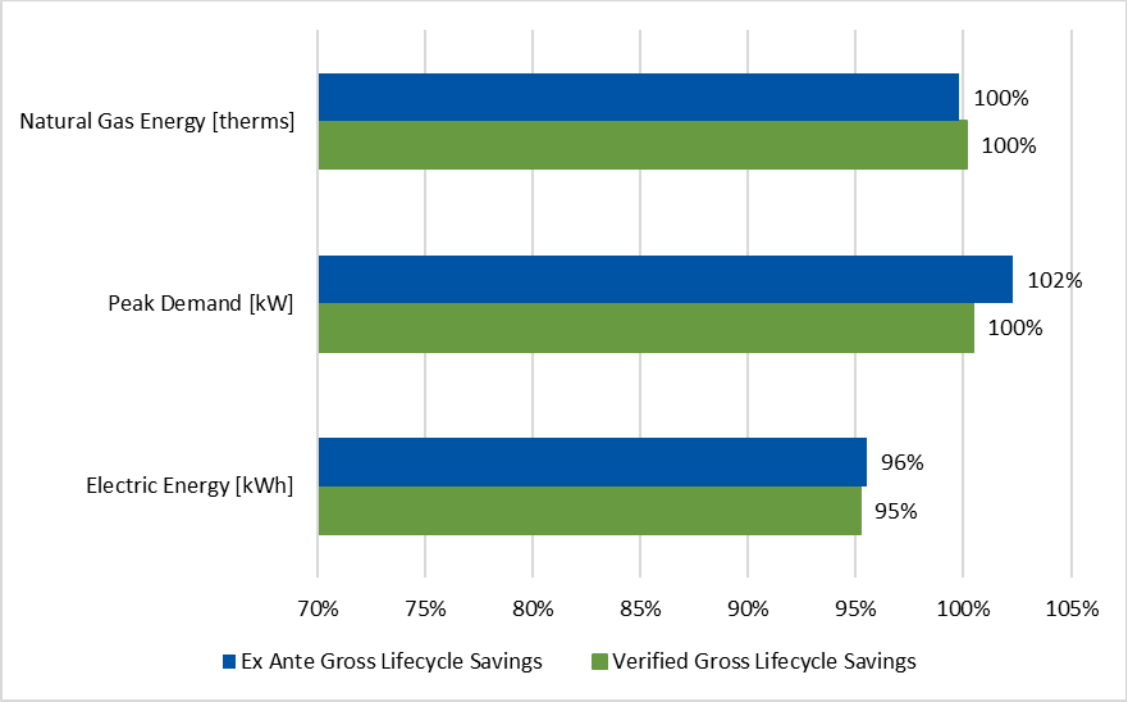
Table 211. Design Assistance Program Summary

Item	Units	CY 2018	CY 2019
Incentive Spending	$	$4,539,595	$4,138,266
Participation	Number of Participants	131	124
Verified Gross Lifecycle Savings	kWh	742,467,464	736,287,341
	kW	5,073	5,562
	therms	32,427,389	30,411,616
Verified Gross Lifecycle Realization Rate	% (MMBtu)	100%	100%
First-Year NTG Ratio	% (MMBtu)	72%	72%
Net First-Year Savings	kWh/year	26,728,037	26,505,559
	kW	3,652	4,005
	therms/year	1,171,884	1,099,037
Net Lifecycle Savings	MMBtu	4,158,214	3,998,275
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	4.13	1.80

Note: The values in this table are inclusive of both offerings: Design Assistance and Design Assistance—Residential. Incentive spending and participation values are inclusive of both measures: Design and Modeling Assistance, and Project Savings Verification.

Figure 134 shows the percentage of gross lifecycle savings goals achieved by the Design Assistance Program in CY 2019. The Program came in slightly below its electrical savings goal, although it did meet its peak demand savings goal. The Program achieved its gas savings goal.

Figure 134. Design Assistance Program Achievement of CY 2019 Gross Lifecycle Savings Goals



The Program Implementer is required to meet a gross lifecycle MMBtu goal in addition to fuel-specific savings targets.

Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted impact and process evaluations of the Design Assistance Program in CY 2019. Table 212 lists specific data collection activities and sample sizes used in the evaluations.

Table 212. CY 2019 Design Assistance Program Data Collection Activities and Sample Sizes

Activity	CY 2019 Sample Size (n)
Tracking Database Review	Census

Note: Values in this table include both offerings: Design Assistance and Design Assistance—Residential.

Tracking Database Review

The Evaluation Team reviewed the census of Design Assistance Program records in Focus on Energy's database, SPECTRUM. This review involved completing the following tasks:

- Thoroughly review the data to ensure SPECTRUM totals matched the Program Administrator's reported totals
- Reassign savings from database adjustment measures to corresponding program measures

- Check for complete and consistent applications of information across data fields (e.g., measure names, first-year savings applications, effective useful life [EUL] applications)

Impact Evaluation

To measure the impact of the Design Assistance Program, the Evaluation Team conducted a review of the tracking database.

Evaluation of Gross Savings

The Evaluation Team used the CY 2019 tracking data to gather reported installations. The Team did not conduct any other EM&V activities, such as an engineering desk review or verification site visits, and therefore applied historical realization rates derived from the CY 2018 evaluation to the CY 2019 Program data to determine verified gross savings.

In-Service Rates

The in-service rate (ISR) represents the percentage of measures still installed, in use, and operating properly following installation by the Program Implementer. Because each measure for the Design Assistance Program comprises multiple energy conservation strategies, the 100% ISR reflects the total number of completed projects. Because the Evaluation Team did not visit any sites in CY 2019, the 100% ISR identified from the CY 2018 site visits was applied to the CY 2019 Program data.

Verified Gross Savings Results

Table 213 lists the first-year and lifecycle realization rates for the CY 2019 Program. Overall, the Program achieved a first-year evaluated realization rate of 100%, weighted by total (MMBtu) *ex ante* energy savings. The totals presented in this report represent a weighted average realization rate for the entire Program.

Table 213. CY 2019 Design Assistance Program
First-Year and Lifecycle Realization Rates

First-Year Realization Rate				Lifecycle Realization Rate		
kWh	kW	therms	MMBtu	kWh	therms	MMBtu
100%	98%	101%	100%	100%	100%	100%

Note: The values in this table are inclusive of both offerings: Design Assistance and Design Assistance—Residential.

Table 214 lists the *ex ante* and verified first-year gross savings for the Program for CY 2019.

Table 214. CY 2019 Design Assistance Program First-Year Gross Savings Summary

Measure Category	*Ex Ante* Gross First-Year Savings			Verified Gross First-Year Savings		
	kWh	kW	therms	kWh	kW	therms
Design Assistance	30,789,455	4,909	852,655	30,699,145	4,821	859,014
Design Assistance—Residential	6,132,118	755	662,485	6,114,132	741	667,426
Total First-Year	**36,921,573**	**5,664**	**1,515,140**	**36,813,277**	**5,562**	**1,526,440**

Table 215 lists the *ex ante* and verified gross lifecycle savings by measure category for the Program in CY 2019.

Table 215. CY 2019 Design Assistance Program Lifecycle Gross Savings Summary

Measure Category	*Ex* Ante Gross Lifecycle Savings			Verified Gross Lifecycle Savings		
	kWh	kW	therms	kWh	kW	therms
Design Assistance	615,789,100	4,909	17,053,100	614,001,087	4,821	17,114,337
Design Assistance—Residential	122,642,360	755	13,249,700	122,286,254	741	13,297,279
Total Lifecycle	**738,431,460**	**5,664**	**30,302,800**	**736,287,341**	**5,562**	**30,411,616**

Evaluation of Net Savings

The Evaluation Team did not perform any new NTG activities in CY 2019 and therefore did not calculate new freeridership or spillover estimates.

Verified Net Savings Results

The Team applied the historical CY 2018 lifecycle MMBtu NTG ratio to the CY 2019 verified gross savings to determine the net savings for CY 2019.[97] Table 216 shows the weighted historical average NTG ratio along with the total lifecycle gross and net savings.

Table 216. Design Assistance Program Lifecyle Net Savings and NTG

Total Lifecycle Gross Verified Savings (MMBtu)	Total Lifecycle Net Savings (MMBtu)	Program First-Year NTG Ratio
5,553,160	3,998,275	72%

Table 217 shows the first-year net demand and energy impacts (kWh, kW, and therms) by measure category for the Program. The Evaluation Team attributed these savings as net of what would have occurred naturally without the presence of the Program.

Table 217. Design Assistance Program First-Year Net Savings

Measure Category	First-Year Net Savings		
	kWh	kW	therms
Design Assistance	22,103,385	3,471	618,490
Design Assistance—Residential	4,402,175	534	480,547
Total First-Year	**26,505,559**	**4,005**	**1,099,037**

Table 218 lists the lifecycle net demand and energy impacts (kWh, kW, and therms) by measure category for the Program.

[97] The Evaluation Team performed NTG evaluation activities in CY 2015, CY 2016, and CY 2017. The NTG ratio applied to CY 2018 was a lifecycle MMBtu weighted historical average of CY 2015, CY 2016, and CY 2017 NTG results.

Table 218. Design Assistance Program Lifecycle Net Savings

Measure Category	Lifecycle Net Savings		
	kWh	kW	therms
Design Assistance	442,080,783	3,471	12,322,323
Design Assistance—Residential	88,046,103	534	9,574,041
Total Lifecycle	**530,126,886**	**4,005**	**21,896,364**

Program Cost-Effectiveness

Evaluators commonly use cost-effectiveness tests to compare the benefits and costs of a demand-side management offering. The benefit/cost test used in Wisconsin is a modified version of the total resource cost (TRC) test. *Appendix F* includes a description of the TRC test. Table 219 lists the CY 2019 incentive costs for the Design Assistance Program.

Table 219. Design Assistance Program Incentive Costs

	CY 2019
Incentive Costs	$4,138,266

The Evaluation Team found that the CY 2019 Design Assistance Program was cost-effective (1.80). Table 220 lists the evaluated costs and benefits.

Table 220. Design Assistance Program Costs and Benefits

Cost and Benefit Category	CY 2019
Costs	
Administration Costs	$0
Delivery Costs	$2,379,945
Incremental Measure Costs	$24,842,017
Total Non-Incentive Costs	**$27,221,962**
Benefits	
Electric Benefits (kWh)	$17,876,202
Electric Benefits (kW)	$10,093,148
Gas Benefits	$11,687,717
Emissions Benefits	$9,273,108
Total TRC Benefits	**$48,930,174**
Net TRC Benefits	**$21,708,212**
TRC B/C Ratio	**1.80**

Evaluation Outcomes and Recommendations

Because no new impact or process evaluation activities were performed in CY 2019, the Evaluation Team does not have recommendations for improving the Design Assistance Program at this time.

Large Energy Users Program

Through the Large Energy Users Program, Wisconsin Focus on Energy provides custom and prescriptive incentives to customers whose average monthly demand exceeds 1,000 kW of electricity or 100,000 therms of natural gas per month and whose combined utility bills were at least $60,000 in any month of the preceding year. Participating customers include commercial, industrial, educational, healthcare, and governmental facilities.

The Large Energy Users Program is administered by APTIM. The Program Implementer is Leidos Engineering, LLC. The Program Implementer assigns Energy Advisors, who are employees of Leidos or its subcontractor CleanTech Partners, to participating customers to help them identify savings opportunities at their facilities.

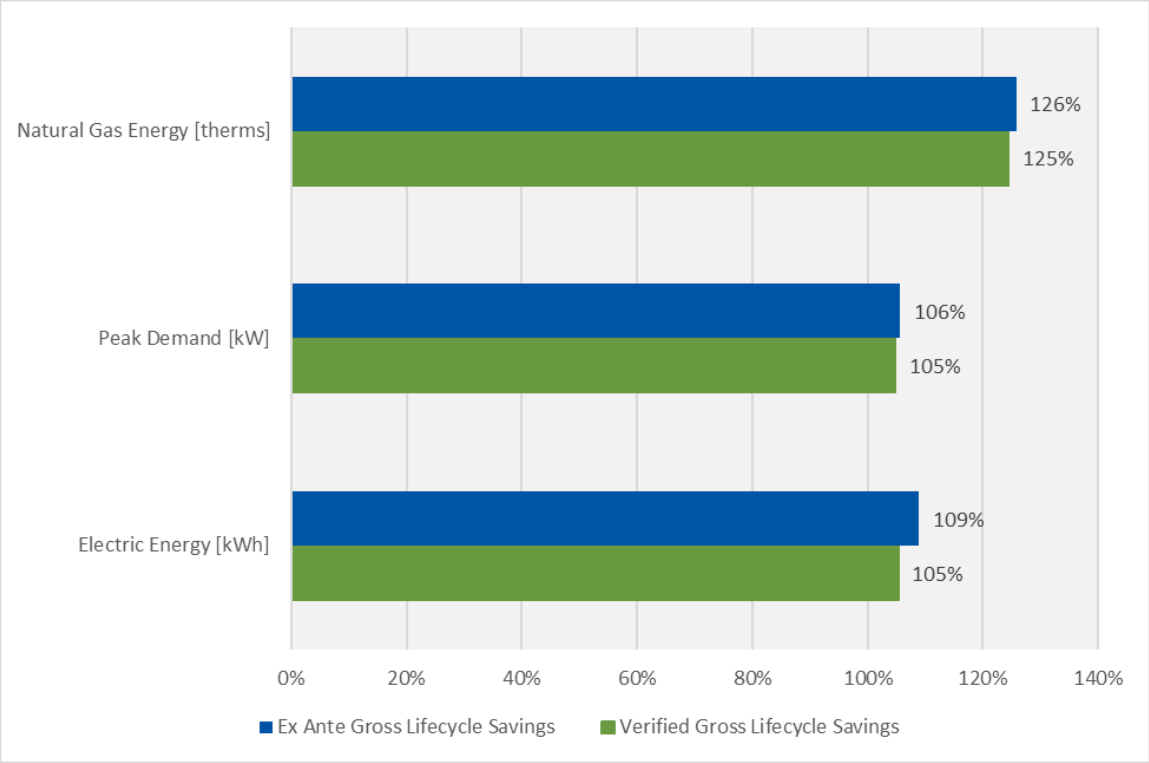
Table 221 summarizes the impacts from the Large Energy Users Program, along with actual spending, savings, participation, and cost-effectiveness.

Table 221. Large Energy Users Program Summary

Item	Units	CY 2018	CY 2019
Incentive Spending	$	$9,964,658	$12,105,098
Participation	Number of Participants	363	383
Verified Gross Lifecycle Savings	kWh	2,306,479,992	2,354,215,406
	kW	20,285	19,400
	therms	187,849,746	236,691,987
Verified Gross Lifecycle Realization Rate	% (MMBtu)	92%	98%
Annual Net-to-Gross Ratio	% (MMBtu)	62%	76%
Net First-Year Savings	kWh/yr	104,063,371	127,414,241
	kW	12,577	14,744
	therms/yr	7,346,018	12,059,448
Net Lifecycle Savings	MMBtu	15,744,124	24,047,169
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	7.67	4.89

Figure 135 shows the percentage of gross lifecycle savings goals achieved by the Large Energy Users Program in CY 2019. The Program exceeded all of its electric and natural gas energy savings and peak demand reduction goals in CY 2019.

Figure 135. Large Energy Users Program Performance Achievement of CY 2019 Gross Lifecycle Savings Goals



The Program Implementer is required to meet a gross lifecycle MMBtu goal in addition to fuel-specific savings targets.

Evaluation, Measurement, and Verification Approach

In CY 2019, the Evaluation Team conducted an impact evaluation of the Large Energy Users Program. The Team completed a limited process evaluation by summarizing findings from the online Trade Ally survey administered by the Program Administrator. Table 222 lists specific data collection activities and sample sizes used in the evaluations specific to each Program.

Table 222. Large Energy Users Program Data Collection Activities and Sample Sizes

Activity	CY 2019 Sample Size (n)
Tracking Database Review	Census
Ongoing Participant Satisfaction Surveys	127
Trade Ally Surveys [a]	8
Online Focus Groups and In-Depth Interviews	7
Engineering Desk Reviews/ Strategic Energy Management Regression Analysis	44
Verification Site Visits	44

[a] The Program Administrator designed and administered the CY 2019 Trade Ally survey for nine residential and commercial programs. The Evaluation Team analyzed the responses of Large Energy Users Trade Allies for this evaluation.

Tracking Database Review

The Evaluation Team reviewed the census of Program records in SPECTRUM, the Focus on Energy database. The review involved the following tasks:

- Conduct a thorough data review to ensure SPECTRUM totals matched totals reported by the Program Administrator
- Reassign savings from a number of database-adjustment measures to corresponding Program measures
- Check for complete and consistent applications of information across data fields (e.g., measure names, application of first-year savings, application of effective useful life)

Ongoing Participant Satisfaction Surveys

The PSC requested that the Evaluation Team conduct satisfaction surveys beginning in CY 2019 for the CY 2019-CY 2022 quadrennium, continuing the practice established for the previous quadrennium in CY 2015. There were two objectives for these satisfaction surveys:

- Understand customer satisfaction on an ongoing basis and respond to any changes in satisfaction before the end of the annual reporting schedule
- Help facilitate timely follow-up with customers to clarify and address service concerns

The Team used SPECTRUM data to sample CY 2019 participants and administered web-based satisfaction surveys throughout the year. The Team supplemented the web-based surveys with mailed paper surveys sent to participants without email addresses on file. The Team combined results from both modes for conducting the analysis. In total, 127 Large Energy Users Program participants responded to the CY 2019 survey regarding several topics, such as the following:

- Overall satisfaction
- Satisfaction with Program staff and Trade Allies
- Likelihood of recommending the Program
- Likelihood of initiating another energy efficiency improvement
- Open feedback regarding the Program (comments and suggestions)

Large Energy Users Program Trade Ally Surveys

The Program Administrator surveyed a random sample of eight Trade Allies to ask them about their experiences participating in the Large Energy Users Program. At the time of the online survey, the Program had 62 unique contractors (determined by unique company name) who had submitted 581 Program applications since 2015. Eight of 62 responded to the survey, for a 13% response rate.

Online Focus Groups and In-Depth Interviews

The Evaluation Team completed qualitative research with large healthcare facilities and hospitals that had either never participated in the Large Energy Users Program or had participated previously but completed few projects. Because this was a cross-cutting task that also solicited input from Wisconsin healthcare facilities that participated in the Business Incentive Program, the Team synthesized results

across all. The Team conducted an online video webcam discussion with two hospital facility managers and one-on-one phone interviews with five hospital facility managers or decision-makers. See *Appendix K* for a cross-cutting summary of methodology and findings.

Engineering Desk Review

The Evaluation Team reviewed all available project documentation in SPECTRUM for a sample of 44 Program measures. This review included an assessment of the savings calculations and methodology applied by the Program Implementer. The Team relied on the applicable TRMs and other relevant secondary sources as needed. Secondary sources included energy codes and standards, case studies, and energy efficiency program evaluations of comparable measures (based on geography, sector, measure application, and date of issue).

For prescriptive measures in Wisconsin, the Team used Focus on Energy TRM and associated workpapers as primary sources to determine methodology and data in nearly all cases. For hybrid and custom measures, the Team reviewed the SPECTRUM savings analysis workbooks and adjusted inputs and methodologies as necessary based on engineering judgment and project documentation. The Team selected the evaluation sample for these reviews using a weighted, random stratified sampling approach known as probability proportional to size (PPS), where size is based on lifecycle total energy savings.

Verification Site Visits

The Evaluation Team conducted 44 verification site visits for the CY 2019 Large Energy Users Program. Site visits involved verifying the type and quantity of equipment installed, determining how the installed equipment is controlled, and documenting the operating hours of the installed equipment. The Team verified savings calculation input parameters based on operational and occupancy schedules, metered data, claimed and observed setpoints, trend data, utility data, and any other relevant details identified prior to or upon arrival at the site.

Impact Evaluation

The Evaluation Team used the following approaches to measure the impact of the Large Energy Users Program:

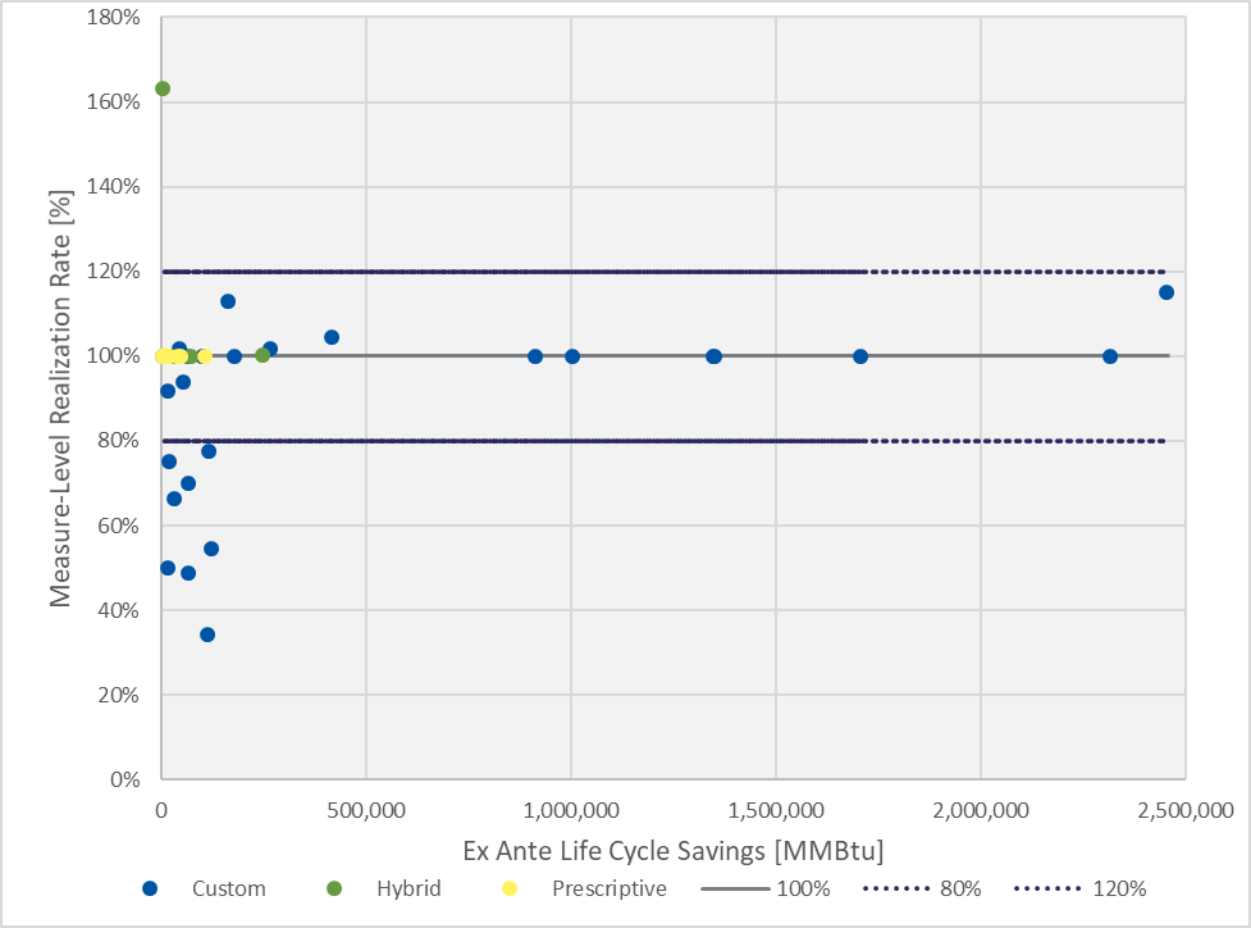
- Tracking database review
- In-service rate determination
- Engineering desk reviews
- Verification site visits

Evaluation of Gross Savings

The Evaluation Team used the CY 2019 tracking data to gather reported installations then applied the results from engineering desk reviews (n=44) and verification site visits (n=44) to determine verified gross savings. The sampled projects represent 42% of lifecycle MMBtu savings for the Large Energy Users Program.

Figure 136 represents the magnitude and associated realization rates for reported MMBtu savings for sampled projects. One site had a realization rate greater than 120%, and eight sites had realization rates below 80%. Specific details related to these projects can be found in *Appendix H. Measure Analysis*.

Figure 136. Large Energy Users Program Sample Results



Verified Gross Savings Results

Table 223 lists the first-year and lifecycle realization rates for the CY 2019 Program. Overall, the Program achieved a first-year evaluated realization rate of 98.9%, weighted by total (MMBtu) energy savings. EUL adjustments drive the difference between first-year and lifecycle realization rates. The totals presented in this report are derived using *ex ante* savings weighting of the realization rates of a sample of projects chosen using the PPS sampling methodology.

Table 223. CY 2019 Large Energy Users Program First-Year and Lifecycle Realization Rates

Measure	First-Year Realization Rate				Lifecycle Realization Rate		
	kWh	kW	therms	MMBtu	kWh	therms	MMBtu
Total	99%	99%	99%	99%	97%	99%	98%

Table 224 lists the *ex ante* and verified first-year gross savings for the Program for CY 2019 by measure type.

Table 224. CY 2019 Large Energy Users Program First-Year Gross Savings Summary

Measure	*Ex Ante* Gross First Year			Verified Gross First Year		
	kWh	kW	therms	kWh	kW	therms
Air Sealing	0	0.0	48,580	0	0.0	47,974
Boiler	93,995	8.5	705,794	93,256	8.4	696,983
Chiller	6,233,779	418.4	0	6,184,752	415.1	0
Compressor	2,612,209	326.6	0	2,591,665	324.1	0
Controls	8,063,276	995.6	210,523	7,999,861	987.7	207,895
Delamping	50,618	8.9	0	50,220	8.9	0
Dishwasher, Commercial	0	0.0	834	0	0.0	824
Door	138,489	0.0	0	137,400	0.0	0
Dryer	386,869	67.5	0	383,826	67.0	0
Energy Recovery	8,656,940	1,550.7	7,913,564	8,588,856	1,538.5	7,814,767
Filtration	177,593	31.6	64,532	176,196	31.3	63,726
Fryer	0	0.0	4,403	0	0.0	4,348
Furnace	2,362	0.3	1,118	2,343	0.3	1,104
Ice Machine	1,245	0.1	0	1,235	0.1	0
Infrared Heater	0	0.0	594	0	0.0	586
Insulation	0	0.0	197,222	0	0.0	194,760
Light Emitting Diode (LED)	62,508,853	8,760.7	0	62,017,242	8,691.8	0
Motor	1,253,461	143.1	0	1,243,603	142.0	0
Other	34,115,810	2,565.0	6,645,984	33,847,501	2,544.8	6,563,012
Oven	0	0.0	1,092	0	0.0	1,078
Pump	1,347,037	130.9	0	1,336,443	129.9	0
Reconfigure Equipment	924,564	189.5	0	917,293	188.0	0
Rooftop Unit/Split System A/C	146,873	73.3	2,538	145,718	72.7	2,506
Scheduling	222,781	0.0	34,805	221,029	0.0	34,370
Specialty Pulp & Paper	1,384,474	165.7	0	1,373,586	164.4	0
Steam Trap	0	0.0	236,581	0	0.0	233,628
System Isolation	340,704	0.0	0	338,024	0.0	0
Tune-up/Repair/Commissioning	7,907,350	0.0	0	7,845,161	0.0	0
Variable Speed Drive	32,335,142	4,102.1	0	32,080,837	4,069.8	0
Water Heater	-150	0.0	135	-149	0.0	133
Welder	75,009	15.0	0	74,419	14.9	0
Total First Year	**168,979,282**	**19,553**	**16,068,299**	**167,650,317**	**19,400**	**15,867,694**

Table 225 lists the *ex ante* and verified gross lifecycle savings by measure type for the Program in CY 2019.

Table 225. CY 2019 Large Energy Users Program Lifecycle Gross Savings Summary

Measure	*Ex Ante* Gross Lifecycle			Verified Gross Lifecycle		
	kWh	kW	therms	kWh	kW	therms
Air Sealing	0	0.0	529,000	0	0.0	523,263
Boiler	1,409,925	8.5	13,117,018	1,363,568	8.4	12,974,759
Chiller	120,362,184	418.4	0	116,404,793	415.1	0
Compressor	39,183,195	326.6	0	37,894,890	324.1	0
Controls	102,704,735	995.6	2,321,568	99,327,903	987.7	2,296,390
Delamping	506,180	8.9	0	489,537	8.9	0
Dishwasher, Commercial	0	0.0	8,340	0	0.0	8,250
Door	2,769,780	0.0	0	2,678,712	0.0	0
Dryer	5,803,031	67.5	0	5,612,233	67.0	0
Energy Recovery	129,854,101	1,550.7	118,135,422	125,584,625	1,538.5	116,854,194
Filtration	-201,705	31.6	967,978	-195,073	31.3	957,480
Fryer	0	0.0	52,836	0	0.0	52,263
Furnace	42,502	0.3	20,114	41,104	0.3	19,895
Ice Machine	12,450	0.1	0	12,041	0.1	0
Infrared Heater	0	0.0	8,904	0	0.0	8,807
Insulation	0	0.0	3,199,319	0	0.0	3,164,621
Light Emitting Diode (LED)	933,944,275	8,760.7	0	903,237,098	8,691.8	0
Motor	22,543,391	143.1	0	21,802,186	142.0	0
Other	511,174,188	2,565.0	99,293,305	494,367,279	2,544.8	98,216,428
Oven	0	0.0	13,104	0	0.0	12,962
Pump	17,781,415	130.9	0	17,196,779	129.9	0
Reconfigure Equipment	13,868,456	189.5	0	13,412,475	188.0	0
Rooftop Unit/Split System A/C	2,182,259	73.3	25,381	2,110,509	72.7	25,106
Scheduling	2,617,735	0.0	174,025	2,531,666	0.0	172,138
Specialty Pulp & Paper	20,767,100	165.7	0	20,084,298	164.4	0
Steam Trap	0	0.0	1,419,491	0	0.0	1,404,096
System Isolation	5,110,560	0.0	0	4,942,530	0.0	0
Tune-up/Repair/Commissioning	15,814,697	0.0	0	15,294,725	0.0	0
Variable Speed Drive	485,027,142	4,102.1	0	469,079,923	4,069.8	0
Water Heater	-1,500	0.0	1,350	-1,451	0.0	1,335
Welder	975,117	15.0	0	943,056	14.9	0
Total Lifecycle	**2,434,251,212**	**19,553**	**239,287,155**	**2,354,215,406**	**19,400**	**236,691,987**

Evaluation of Net Savings

The Evaluation Team did not perform any new NTG evaluation activities in CY 2019 and therefore did not calculate new freeridership or spillover estimates.

Verified Net Savings Results

The Evaluation Team applied the lifecycle MMBtu weighted historical average of the CY 2015, CY 2016, and CY 2018 NTG ratios to the 2019 verified gross savings to determine the net savings for CY 2019.[98] This yielded an overall NTG estimate of 76% for the Program in CY 2019. Table 226 shows the weighted historical average NTG ratio, as well as the total first-year gross and net savings.

Table 226. Large Energy Users Program Lifecycle Net Savings and NTG

Total Lifecycle Gross Verified Savings (MMBtu)	Total Lifecycle Net Savings (MMBtu)	Program NTG Ratio
31,641,011	24,047,169	76%

Table 227 shows the first-year net demand and energy impacts (kWh, kW, and therms) by measure category for the Program. The Evaluation Team attributed these savings as net of what would have occurred naturally without the presence of the Program.

Table 227. Large Energy Users Program First-Year Net Savings

Measure	First-Year Net		
	kWh	kW	therms
Air Sealing	0	0	36,460
Boiler	70,874	6	529,707
Chiller	4,700,412	315	0
Compressor	1,969,665	246	0
Controls	6,079,894	751	158,000
Delamping	38,167	7	0
Dishwasher, Commercial	0	0	626
Door	104,424	0	0
Dryer	291,708	51	0
Energy Recovery	6,527,531	1,169	5,939,223
Filtration	133,909	24	48,432
Fryer	0	0	3,305
Furnace	1,781	0	839
Ice Machine	939	0	0
Infrared Heater	0	0	446
Insulation	0	0	148,017
Light Emitting Diode (LED)	47,133,104	6,606	0
Motor	945,138	108	0
Other	25,724,100	1,934	4,987,889
Oven	0	0	820
Pump	1,015,697	99	0
Reconfigure Equipment	697,142	143	0
Rooftop Unit/Split System A/C	110,746	55	1,905
Scheduling	167,982	0	26,122
Specialty Pulp & Paper	1,043,925	125	0

[98] The Evaluation Team did not perform NTG evaluation activities in CY 2017.

Measure	First-Year Net		
	kWh	kW	therms
Steam Trap	0	0	177,557
System Isolation	256,899	0	0
Tune-up/Repair/Commissioning	5,962,323	0	0
Variable Speed Drive	24,381,436	3,093	0
Water Heater	-113	0	101
Welder	56,559	11	0
Total First Year	**127,414,241**	**14,744**	**12,059,448**

Table 228 lists lifecycle net demand and energy impacts (kWh, kW, and therms) by measure category.

Table 228. Large Energy Users Program Lifecycle Net Savings

Measure	Lifecycle Net		
	kWh	kW	therms
Air Sealing	0	0	397,680
Boiler	1,036,312	6	9,860,817
Chiller	88,467,643	315	0
Compressor	28,800,116	246	0
Controls	75,489,206	751	1,745,256
Delamping	372,048	7	0
Dishwasher, Commercial	0	0	6,270
Door	2,035,821	0	0
Dryer	4,265,297	51	0
Energy Recovery	95,444,315	1,169	88,809,188
Filtration	-148,256	24	727,685
Fryer	0	0	39,720
Furnace	31,239	0	15,120
Ice Machine	9,151	0	0
Infrared Heater	0	0	6,694
Insulation	0	0	2,405,112
Light Emitting Diode (LED)	686,460,194	6,606	0
Motor	16,569,661	108	0
Other	375,719,132	1,934	74,644,485
Oven	0	0	9,851
Pump	13,069,552	99	0
Reconfigure Equipment	10,193,481	143	0
Rooftop Unit/Split System A/C	1,603,987	55	19,080
Scheduling	1,924,066	0	130,825
Specialty Pulp & Paper	15,264,066	125	0
Steam Trap	0	0	1,067,113
System Isolation	3,756,323	0	0
Tune-up/Repair/Commissioning	11,623,991	0	0
Variable Speed Drive	356,500,741	3,093	0
Water Heater	-1,103	0	1,015
Welder	716,723	11	0
Total Lifecycle	**1,789,203,709**	**14,744**	**179,885,910**

Process Evaluation

In CY 2019, the Evaluation Team focused on measuring participant satisfaction and assessing Trade Ally experience with the Large Energy Users Program. A discussion of the results from the cross-cutting research surrounding healthcare facilities is provided in *Appendix K*.

Program Design, Delivery, and Goals

The Program Implementer assigns each participant an Energy Advisor, who coordinates with utility key account managers (KAMs) and Trade Allies to help customers identify and quantify opportunities for saving energy, apply for incentives, manage energy-use fundamentals, and access other available resources. To become eligible for custom measures, customers must work with an Energy Advisor to estimate savings and to receive preapproval prior to purchasing or beginning the project. The KAM may lead project meetings and use the Energy Advisor as a resource.

Trade Allies play a key role in introducing project ideas, working through project implementation and savings calculations, and completing the project, from initiation to closure, with the large energy user.

The Program Implementer offers a webinar to Trade Allies at the end of each year about changes for the following year. Any additional Trade Ally webinars are offered on an as-needed basis.

Program Goals

The Large Energy Users Program's overall objective is to encourage large commercial and industrial businesses to use more energy-efficient products and processes. For CY 2019, Focus on Energy set the following savings goals for the Program:[99]

- Demand reduction of 18,500 kW
- Lifecycle electric savings of 2,233,748,535 kWh
- Lifecycle natural gas savings of 190,084,496 therms

Trade Ally Experience

Satisfaction with Focus on Energy

Trade Ally respondents rated their overall experience with Focus on Energy on a 5-point scale, where 1 was *very dissatisfied* and 5 was *very satisfied*. Overall, respondents were highly satisfied with Focus on Energy. Seven of eight respondents rated their satisfaction as a 5, while one respondent rated satisfaction as a 4.

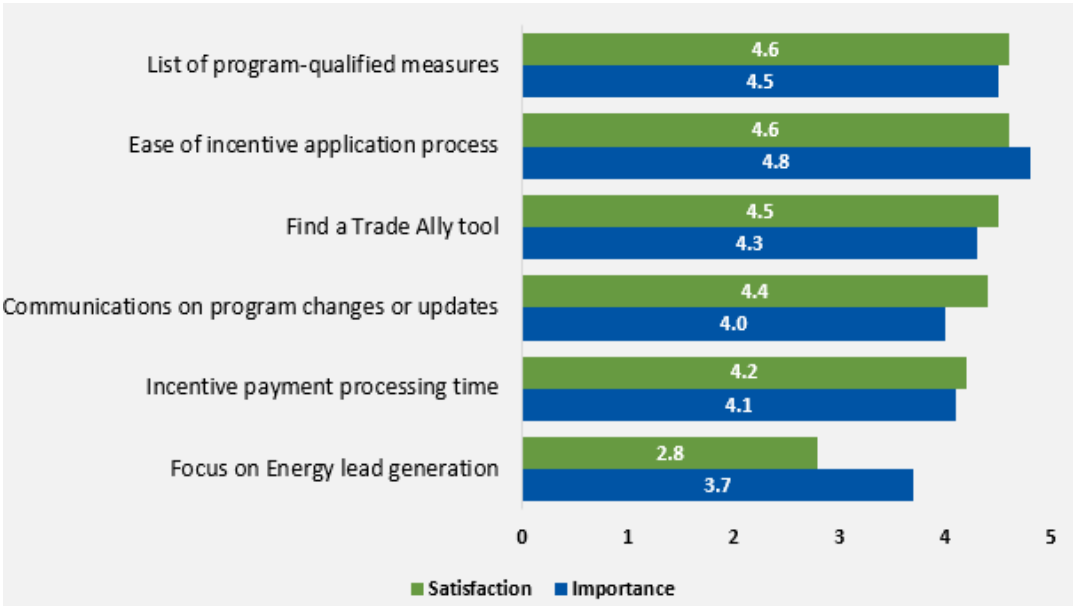
[99] Metrics presented in this section represent Focus on Energy's targets for the Program and not contractual goals for the Program Implementer. The Program Implementer is required to meet a gross lifecycle MMBtu goals in addition to fuel-specific savings targets.

Program Component Satisfaction and Importance

Trade Allies were asked to rate their satisfaction with Program components (5-point scale, where 1 was *very dissatisfied* and 5 was *very satisfied*), as well as the importance of these Program components (5-point scale, where 1 was *not at all important* and 5 was *very important)*.

As shown in Figure 137, Trade Ally respondents were most satisfied with the components they said were most important (ease of the incentive application process and the list of qualified measures) and least satisfied with the component they said was least important (Focus on Energy lead generation). Three of the four respondents who were less satisfied with Focus on Energy lead generation said they had not received any leads from Focus on Energy, while one respondent had not received as many leads as desired.[100]

Figure 137. Satisfaction with and Importance of Program Components (Mean Scores)



Source: Trade Ally Survey Questions. "How satisfied are you with…?"and "How important is…?" on a five-point scale. (n=5 to 8)

Trade Ally Portal Preferences

The survey asked respondents to rank how useful different types of information were to include on the Trade Ally portal using a 7-point scale, where 1 was *most useful* and 7 was *least useful.* Five of six respondents said incentive application status was the *most useful* information to include on the portal,

[100] It is possible that some Trade Allies misinterpreted this survey prompt, which was intended to determine whether Focus on Energy helped with lead generation in general. Focus on Energy does not directly provide Trade Allies with customer leads.

while four of seven ranked incentive payment details as a 7 or *least useful*. Table 229 shows the aspects of a Trade Ally portal from *most useful* (1) to *least useful* (7), based on mean responses.

Table 229. Most Useful Information for Trade Ally Portal

Average Rank	Online Trade Ally Portal Information
1	Incentive application status (in-progress, approved for payment, paid)
2	Focus on Energy Program updates and information
3	Contact information for your local Energy Advisor(s)
4	Energy Savings (by project) in the past 12 months
5	Training opportunities relevant to your business
6	Incentive payment details (which projects were paid on a check)
7	Incentives paid (by project) in the past 12 months

Source: Trade Ally Survey Question. "If Focus on Energy were to provide your company with access to an online Trade Ally Portal, what information would you find most useful to have available? Please rank the following features in order of usefulness to you, where 1 is the MOST useful, and 7 is the LEAST useful."

Project Proposals

Most Trade Ally respondents said they *always* promote or include Focus on Energy incentives in their project proposals (six of eight respondents) while two said they *frequently* do this. One respondent who did not always promote or include incentives in a proposal was not sure if the rebate would be approved so did not include it in the proposal to the customer.

Training

The survey asked which kinds of training would be most useful to Trade Allies. Four of eight respondents said training on how to navigate the Focus on Energy programs would be most useful, followed by two who said technical training, and two who said sales training. One respondent who said technical training would be useful said that additional training on how to calculate savings and relay that information to the customer would be helpful.

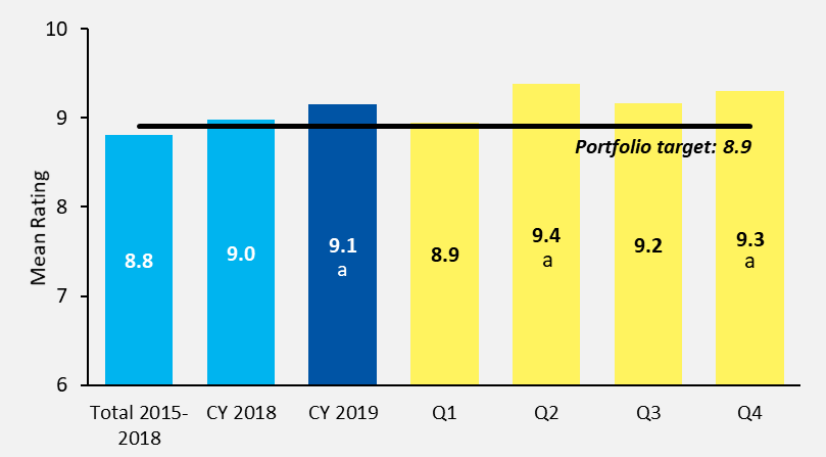
Five of eight Trade Ally respondents said they are most likely to attend the training if they can access it online or via a mobile app in brief, 10-minute increments. Three said they would be willing to attend a half-day training. As for travel time, respondents were split. Four respondents said they are willing to travel up to 50 miles for a training, three said they are not willing to travel at all, and one would travel up to 200 miles to attend a training.

Annual Results from Ongoing Participant Satisfaction Survey

Throughout CY 2019, the Evaluation Team surveyed participants to measure their satisfaction with various aspects of the Large Energy Users Program. Respondents answered questions on a scale of 0 to 10, where 10 indicates the highest satisfaction or likelihood and 0 the lowest.[101]

Figure 138 shows that CY 2019 respondents gave the Program an average overall satisfaction rating of 9.1, which was significantly higher than the portfolio target of 8.9 but statistically equivalent to the average CY 2018 rating of 9.0.[102]

Figure 138. CY 2019 Overall Program Satisfaction



Source: Large Energy Users Program Ongoing Participant Satisfaction Survey Question. "Overall, how satisfied are you with the Program?" (CY 2018 n=128, CY 2019 n=127, Q1 n=35, Q2 n=21, Q3 n=19, Q4 n=44). Total CY 2015-CY 2018 is the participation-weighted average of four annual results.
* Denotes that the result for the year or quarter is statistically significant different from the portfolio baseline (p<0.10 or better using binomial t-tests).

Table 230 shows the average satisfaction and likelihood ratings for CY 2018 and CY 2019. None of these CY 2019 ratings were statistically different from CY 2018, although ratings for Energy Advisors and Trade Allies were up directionally.

[101] The number of participants who completed a survey does not always match the number of responses for each question, as some participants skipped questions, did not know answers to questions, or did not qualify to answer questions based on previous answers or other known data about the participant.

[102] The Program Administrator's contract established a portfolio target of 8.9 to maintain or increase customer satisfaction. The Evaluation Team found that some surveys did not include identifying information to match survey responses to Program participation dates. The Team included survey responses without participation dates in the year-end total but not in the quarterly breakdown.

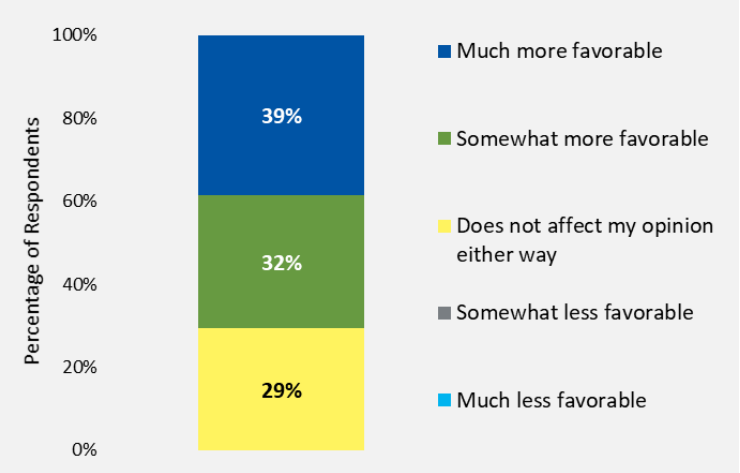
Table 230. CY 2019 Average Ratings for Large Energy Users Program

Item	CY 2018	CY 2019
Satisfaction with Energy Advisor	9.2	9.5
Satisfaction with Trade Ally	8.9	9.2
Likelihood of more improvements	9.1	9.2
Likelihood of recommending the Program	9.5	9.5

Using these survey data, the Evaluation Team calculated a Net Promoter Score (NPS) based on customers' likelihood to recommend the Program. The NPS is expressed as an absolute number between -100 and +100 that represents the difference between the percentage of promoters (respondents giving a rating of 9 or 10) and percentage of detractors (respondents giving a rating of 0 to 6). The Large Energy Users Program had an NPS of +87 for CY 2019, the same as the Program's NPS of +87 for CY 2018.

CY 2019 Program participants were asked if Focus on Energy offerings affected their opinion of their utilities, and more than a third (39%) gave the highest rating of *much more favorable* (Figure 139). Almost a third (29%) said their opinion was not affected, and no respondents reported that their opinion of their utility had become less favorable.

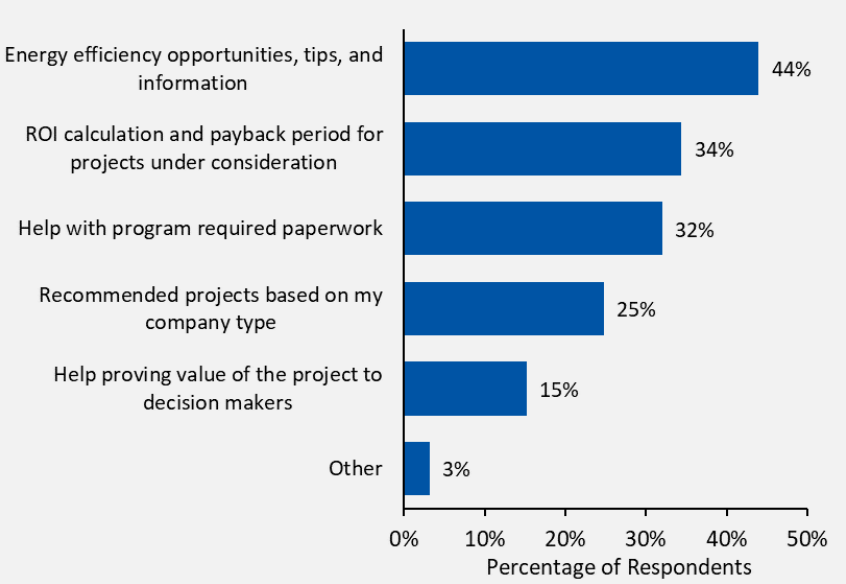
Figure 139. CY 2019 Effect of Focus on Energy Offerings on Opinion of Utilities



Source: Large Energy Users Program Ongoing Participant Satisfaction Survey Question. "Your energy utility partners with Focus on Energy to offer energy efficiency programs to its customers. How have these offerings affected your opinion of your utility, if at all?" (n=119)

Survey respondents identified how Focus on Energy can best support their organization with future projects (Figure 140). The most frequent responses from Program participants were energy efficiency opportunities, tips, and information (44%) and return on investment (ROI) calculations and payback period for projects under consideration (34%).

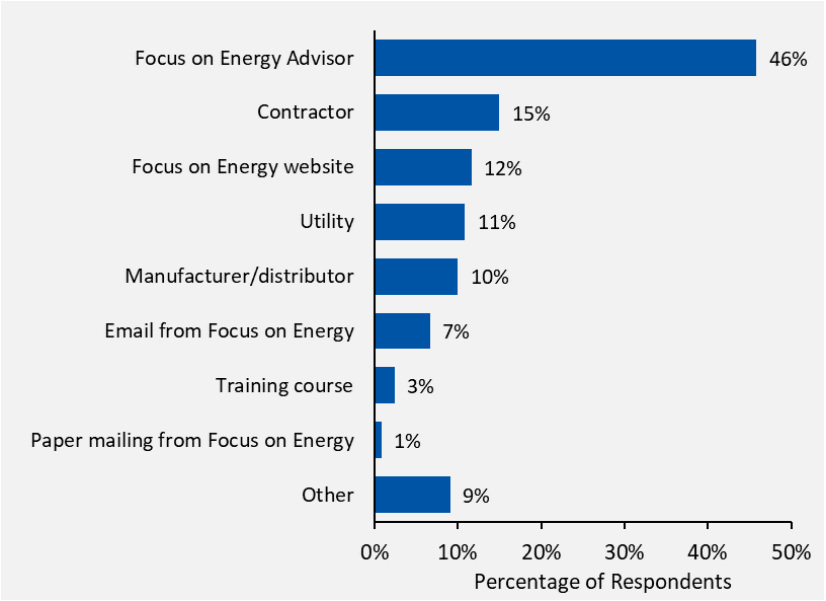
Figure 140. CY 2019 Most Valued Support



Source: Large Energy Users Program Ongoing Participant Satisfaction Survey Question. "Aside from providing project incentive dollars, how can Focus on Energy best support your organization going forward?" (n=126). Responses total to more than 100% because multiple responses were allowed.

Program participants' top two sources of awareness of the Large Energy Users' Program were communications from Energy Advisors (46%) and contractors (15%), as shown in Figure 141.

Figure 141. CY 2019 Sources of Program Awareness



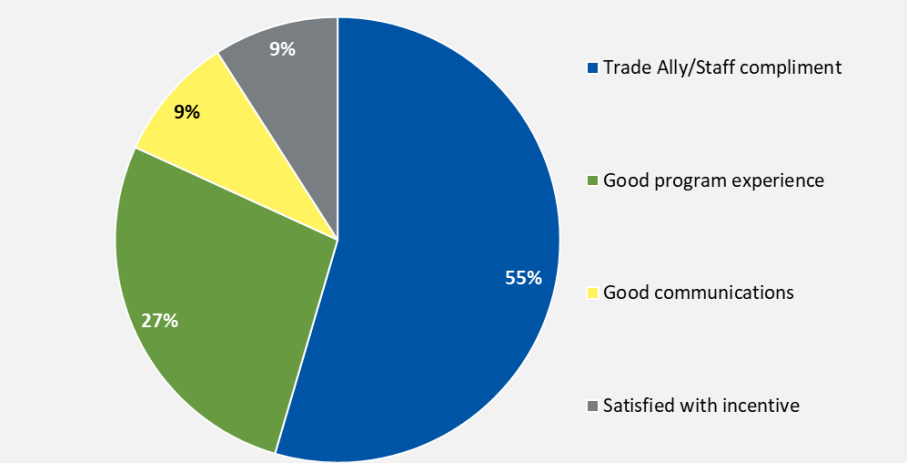
Source: Large Energy Users Program Ongoing Participant Satisfaction Survey Question. "How did you learn about this particular opportunity from Focus on Energy?" (n=120). Responses total to more than 100% because multiple responses were allowed.

Suggestions for Improvement

The ongoing participant satisfaction surveys also included a question about whether participants had any comments or suggestions for improving the Program. Of the 127 participants who responded to the survey, 28% provided open-ended feedback, which the Evaluation Team coded into a total of 43 mentions. Of these open-ended responses, 22 (51%) were complimentary comments, and 21 (49%) were suggestions for improvement.

Respondents' positive comments are shown in Figure 142. Respondents most frequently complimented the Program Energy Advisors and Trade Allies (55%), as they had done in CY 2018. Respondents also commonly commented on a generally positive Program experience (27%).

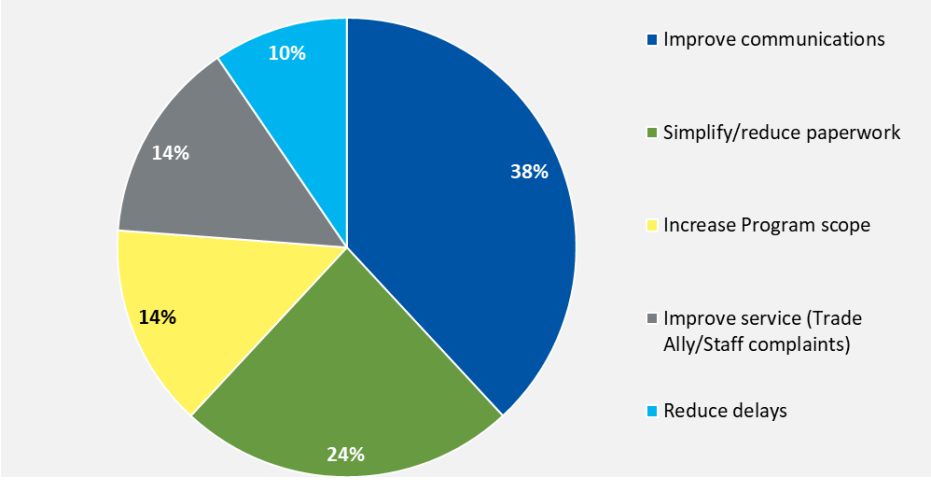
Figure 142. CY 2019 Positive Comments about the Program



Source: Large Energy Users Program Ongoing Participant Satisfaction Survey Question.
"Please tell us more about your experience and any suggestions." (Total positive mentions n=22)

The most frequent suggestions for improvement were to improve communications (38% of mentions) and simplify or reduce Program paperwork (24%), as shown in Figure 143. These were changes from CY 2018 when the most frequent suggestions were to increase incentives (19%) and improve service from Trade Allies and/or Energy Advisors (19%). Several suggestions relating to Program communications mentioned a desire for increased marketing of all current program opportunities. Another frequent suggestion was to provide status updates on accepted or rejected rebate applications.

Figure 143. CY 2019 Suggestions for Improving the Program



Source: Large Energy Users Program Ongoing Participant Satisfaction Survey Question. "Please tell us more about your experience and any suggestions." (Total suggestions for improvement mentions n=21)

Program Cost-Effectiveness

Evaluators commonly use cost-effectiveness tests to compare the benefits and costs of a demand-side management offering. The benefit/cost test used in Wisconsin is a modified version of the total resource cost (TRC) test. *Appendix F* includes a description of the TRC test. Table 231 lists the CY 2019 incentive costs for the Large Energy Users Program.

Table 231. Large Energy Users Program Incentive Costs

	CY 2019
Incentive Costs	$12,105,098

The Evaluation Team found that the CY 2019 Large Energy Users Program was cost-effective (4.89). Table 232 lists the evaluated costs and benefits.

Table 232. Large Energy Users Program Costs and Benefits

Cost and Benefit Category	CY 2019
Costs	
Administration Costs	$988,987
Delivery Costs	$6,940,102
Incremental Measure Costs	$36,988,707
Total Non-Incentive Costs	**$44,917,797**
Benefits	
Electric Benefits (kWh)	$59,000,320
Electric Benefits (kW)	$26,935,705
Gas Benefits	$93,839,800
Emissions Benefits	$39,856,543
Total TRC Benefits	**$219,632,368**
Net TRC Benefits	**$174,714,571**
TRC B/C Ratio	**4.89**

Evaluation Outcomes and Recommendations

The Large Energy Users Program performed well in CY 2019 and exceeded its energy and demand goals. The Evaluation Team identified the following outcomes and recommendations for improving the Large Energy Users Program.

Outcome 1. For some sites, the customer did not fully implement specified projects or was not able to operate at the specified capacities used to estimate reported energy savings. In some cases, the Evaluation Team found that verification reports were submitted before the project implementation was complete. This resulted in reporting incomplete or partial implementation of projects.

Recommendation 1. The Team recommends a change in process to ensure that verification visits to facilities are conducted only after the project is fully implemented. This will allow Focus on Energy to verify that the measure that has been provided an incentive is fully installed and operating. Furthermore, there should be regular communication with the participant to discuss any changes to the project after the application has been approved. If major changes occur, the Program Implementer should update the baseline and adjust estimated energy savings in SPECTRUM to reflect this. This also applies to permanent production changes at the site that may require an adjustment to energy savings.

Outcome 2. Some larger and more complex projects lacked detailed savings calculations, reporting, and data collection. This lack of information caused some discrepancies in calculations in the reported and verified savings. Some of the largest discrepancies in project findings occurred when the Team installed power meters at sites and used actual data to inform savings analysis, resulting in verified savings that significantly deviated from the reported savings.

Recommendation 2. The Team recommends a more comprehensive review and analysis of project savings for larger custom projects that could be more complex and variable. For projects that are provided large incentives for high energy savings, the Team recommends setting a minimum requirement that involves a technical analysis summary (TAS) report, in which the Program Implementer provides details about the methodologies used and assumptions made to calculate savings. The Team also recommends a verification report in addition to the verification sheet, in which assumptions in the TAS are verified, pictures and invoices collected, and any changes to the project accounted for. Whenever possible, meter or trend data should also be included in the analysis to ensure a more accurate representation of savings.

Outcome 3. Participants and Trade Allies expressed high levels of satisfaction with the program. Overall, participants rated their satisfaction with the program as a 9.1 on a 10-point scale and all eight Trade Ally respondents rated their satisfaction as a 4 or 5 on a 5-point scale. Participants were most satisfied with their energy advisor (9.5 mean rating). Trade Allies were most satisfied with the list of Program-qualified measures and the ease of the incentive application process, rating both as a 4.6.

Renewable Energy Competitive Incentive Program

Through the Renewable Energy Competitive Incentive Program (RECIP), Focus on Energy offers financial incentives to Wisconsin business customers that install eligible, cost-effective renewable energy systems. Eligible projects include the installation of solar electric, solar thermal, geothermal, biogas, biomass, or wind systems.

The Program Administrator issues a request for proposals (RFP) three times a year and selects winning proposals through a competitive bid process. The Program Implementers (Franklin Energy, CESA 10, and Leidos) process the awarded projects through the specific Focus on Energy business program for which the customer is eligible (Business Incentive, Agriculture, Schools and Government, and Large Energy Users).

Table 233 lists actual Program spending, savings, participation, and cost-effectiveness in CY 2019.

Table 233. Renewable Energy Competitive Incentive Program Summary

Item	Units	CY 2018	CY 2019
Incentive Spending	$	$2,684,552	$2,564,784
Participation	Number of Participants	58	65
Verified Gross Lifecycle Savings	kWh	259,173,592	272,700,754
	kW	3,623	3,686
	therms	0	0
Verified Gross Lifecycle Realization Rate	% (MMBtu)	100%	100%
Annual NTG Ratio	% (MMBtu)	99%	93%
Net First-Year Savings	kWh/year	10,765,908	10,613,650
	kW	3,587	3,428
	therms/year	0	0
Net Lifecycle Savings	MMBtu	875,143	865,323
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	1.85	1.76

Evaluation, Measurement, and Verification Approach

The Evaluation Team conducted impact and process evaluations of the RECIP in CY 2019. The Team designed its EM&V approach to integrate multiple perspectives in assessing Program performance. Table 234 lists specific data collection activities and sample sizes used in the evaluations.

Table 234. CY 2019 Data Collection Activities and Sample Sizes

Activity	CY 2019 Sample Size (n)
Tracking Database Review	Census
Program Actor Interviews	1
Participant Interviews	10
Engineering Desk Reviews	10
Verification Site Visits	7

Tracking Database Review

The Evaluation Team reviewed the census of RECIP records in Focus on Energy's database, SPECTRUM. This review involved thoroughly reviewing the data to ensure SPECTRUM totals matched the Program Administrator's reported totals and check for complete and consistent applications of information across data fields (e.g., measure names, first-year savings applications, effective useful life [EUL] applications)

Program Actor Interviews

In October 2019, the Evaluation Team interviewed the Program Administrator to complete these tasks:

- Learn about the Program's delivery changes from the CY 2015–CY 2018 quadrennium
- Document the Program activities conducted in CY 2019
- Explore how the program performed in CY 2019 in terms of areas working well and challenges

Participant Interviews

During November 2019, the Evaluation Team conducted telephone interviews with participants to complete these tasks:

- Explore how customers learned about the Program and their communication preferences
- Identify any hidden or undocumented costs of installing renewable energy projects
- Determine the motivations for adopting renewable energy technologies, barriers to adoption, and program participation benefits
- Assess program satisfaction and identify program improvements
- Gather data to inform freeridership and spillover estimates

The Evaluation Team interviewed 10 participants who successfully bid on a renewable energy project and completed installation in CY 2019.

Engineering Desk Review

The Evaluation Team reviewed all available project documentation in SPECTRUM for a sample of 10 Program measures. This review included an assessment of the savings calculations and methodology applied by the Program Implementer. The Team relied on the applicable TRMs and other relevant secondary sources as needed. Secondary sources included energy codes and standards, case studies,

and energy efficiency program evaluations of comparable measures (based on geography, sector, measure application, and date of issue).

The TRM and associated workpapers were the primary sources used by the Evaluation Team to determine methodology and data in nearly all cases. For hybrid and custom measures, the Team reviewed the SPECTRUM savings analysis workbooks and adjusted inputs and methodologies as necessary based on engineering judgment and project documentation.

The Team selected the evaluation sample for these reviews using a weighted, random stratified sampling approach known as probability proportional to size (PPS), where size is based on *ex ante* lifecycle total energy savings.

Verification Site Visits

The Evaluation Team conducted seven verification site visits for the CY 2019 RECIP, verifying the type and quantity of equipment installed. The Team verified input parameters for savings calculations prior to or upon arrival at the site.

Impact Evaluation

The Evaluation Team used the following approaches to measure the impact of the RECIP:

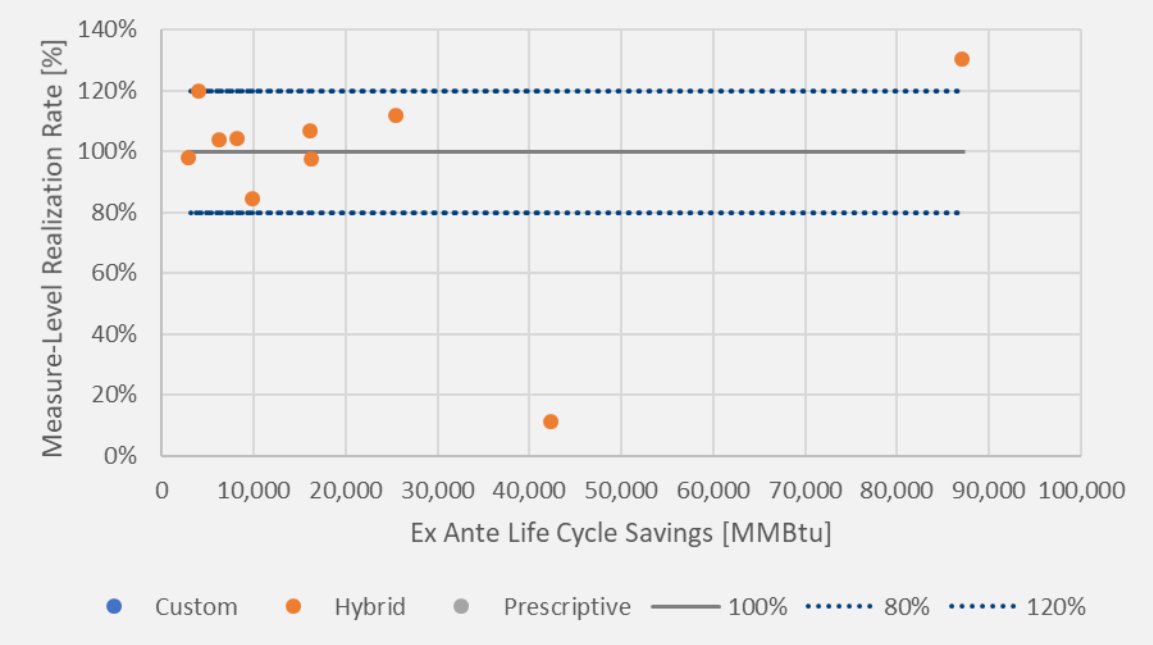
- Tracking database review
- Engineering desk reviews
- Verification site visits

Evaluation of Gross Savings

The Evaluation Team used the CY 2019 tracking data to gather reported installations then applied the results from engineering desk reviews (n=10) and verification site visits (n=7) to determine verified gross savings. The sampled projects represent 12% of RECIP lifecycle MMBtu savings.

Figure 144 illustrates the magnitude and associated realization rates of reported MMBtu savings among sampled projects.

Figure 144. Renewable Energy Competitive Incentive Program Sample Results



One site had a realization rate greater than 120%, and one site had a realization rate less than 80%. All sample projects had realization rates greater than or less than 100%. These atypical measure-level realization rates can be explained by the systemic difference between methods used to calculate *ex ante* and *ex post* savings estimates. All projects calculated *ex ante* savings using a hybrid approach. This method required the Program Implementer to collect site-specific data (e.g., panel orientation, site location, system size, and power) and enter the data into the PVWatts software.

The Evaluation Team calculated *ex post* savings estimates using the deemed per-unit TRM values based on the project location and panel orientation. Specific details related to these projects can be found in *Appendix H. Measure Analysis*.

Verified Gross Savings Results

Table 235 lists the first-year and lifecycle realization rates for the CY 2019 Program. Overall, the Program achieved a first-year evaluated realization rate of 100%, weighted by total (MMBtu) energy savings. The totals presented in this report are derived using *ex ante* savings weighting of the realization rates of a sample of projects chosen using the PPS sampling methodology.

Table 235. CY 2019 Renewable Energy Competitive Incentive Program
First-Year and Lifecycle Realization Rates

Measure	First-Year Realization Rate				Lifecycle Realization Rate		
	kWh	kW	therms	MMBtu	kWh	therms	MMBtu
Total	109%	96%	-	109%	100%	-	100%

Table 236 lists the *ex ante* and verified first-year gross savings for the CY 2019 Program by measure type.

Table 236. CY 2019 Renewable Energy Competitive Incentive Program
First-Year Gross Savings Summary

Measure	*Ex Ante* Gross First Year			Verified Gross First Year		
	kWh	kW	therms	kWh	kW	therms
Geothermal	24,604	0	0	26,814	0	0
Photovoltaics	10,433,866	3,797	0	11,371,174	3,658	0
Wind Electric	13,340	30	0	14,538	29	0
Total First Year	**10,471,810**	**3,827**	**0**	**11,412,526**	**3,686**	**0**

Table 237 lists the *ex ante* and verified gross lifecycle savings by measure type for the CY 2019 Program.

Table 237. CY 2019 Renewable Energy Competitive Incentive Program
Lifecycle Gross Savings Summary

Measure	*Ex Ante* Gross Lifecycle			Verified Gross Lifecycle		
	kWh	kW	therms	kWh	kW	therms
Geothermal	369,060	0	0	369,119	0	0
Photovoltaics	272,021,625	3,797	0	272,064,793	3,658	0
Wind Electric	266,800	30	0	266,842	29	0
Total Lifecycle	**272,657,485**	**3,827**	**0**	**272,700,754**	**3,686**	**0**

Evaluation of Net Savings

The Evaluation Team used participant surveys to assess net savings for the RECIP. The Team calculated a NTG of 93% for the CY 2019 Program. For a detailed description of NTG analysis methodology and findings, refer to *Appendix I. Net Savings Analysis*.

Freeridership Findings

The Evaluation Team used the self-report survey method to determine the Program's freeridership for CY 2019, implementing a modification of past freeridership measurements. For the CY 2015, CY 2016, and CY 2017 freeridership research, the Team relied on customers' self-reported intention to purchase a measure in the absence of the Program. Survey items for this approach addressed the Program's effect on the efficiency, quantity, and timing of purchases. This portion of the freeridership measurement did not change in CY 2019.

Persistent conjecture in the industry, however, indicates intention self-reports may be subject to biases, yielding an inflated freeridership value. To address this possibility and to provide a triangulation of approaches to the estimate, the Team integrated a second set of survey questions in CY 2019, designed to measure the Program's perceived *influence* on the respondents' purchasing decisions.

To estimate Program influence, the survey asked respondents to rate the influence of five Program elements on their purchasing decisions. Responses were captured using a 1 to 4 scale, with 1 meaning "not at all important" and 4 meaning "very important." A surveyed participant's overall influence rating equaled the maximum influence of any single Program element. This drew upon an underlying principle:

if a single element had a substantial influence on a respondent's purchasing decision, the Program successfully influenced the respondent.

For example, to capture respondents' perspectives on elements driving them to an energy-efficient action, the survey included a question shown in Table 238. In this example, a 4 for the Focus on Energy Program incentive or discount (the highest rating) represents the influence component score of freeridership for the respondent.

Table 238. Freeridership Influence Component Question

We would like to know more about the factors that contributed to your purchase of the energy-efficient [MEASURE][s]. I'm going to read a list of possible factors that could have contributed to your decision to install the renewable energy project. For each of the factors listed, please rate how important it was in your decision to install the [MEASURE][s]. Use a scale from 1 to 4, with 1 meaning the factor was "not at all important" and 4 meaning the factor was "very important" in your decision to purchase the [MEASURE][s].						
Rate Influence of Program Elements						
	Not at all important	***Not too important***	***Somewhat important***	***Very important***	**Don't Know**	**Not Applicable**
The Focus on Energy program incentive or discount	1	2	3	(4)	DK	N/A
Recommendation from Focus on Energy Staff	1	2	3	4	(DK)	N/A
Information provided by Focus on Energy on energy savings opportunities	1	2	3	4	(DK)	N/A
Recommendation from a contractor or vendor	1	(2)	3	4	DK	N/A
Previous participation in a Focus on Energy renewable energy or energy efficiency program	1	2	(3)	4	DK	N/A

High program influence and freeridership levels maintain an inverse relationship: the greater the program influence, the lower the participant's final freeridership score. Table 239 presents freeridership levels implied by the influence ratings.

Table 239. Freeridership Implied by Response to Influence Items

Maximum Influence Rating	Freeridership Implied by Response
1 – Not important	100%
2	75%
3	25%
4 - Very important	0%
Don't know	50%

By combining the previously used *intention* methodology (maximum of 100%) with the *influence* methodology (maximum of 100%), through simple averaging at the individual level, the Team produced a combined freeridership estimate for each respondent.

The Team estimated an average self-reported freeridership of 7%, weighted by verified lifecycle evaluated MMBtu savings, for the CY 2019 Program.

Verified Net Savings Results

To calculate the Program NTG, the Evaluation Team combined the self-reported freeridership and spillover results using the following equation:

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

This yielded an overall NTG estimate of 93% for the Program. Table 240 shows total net-of-freeridership savings, participant spillover savings, and total net savings in MMBtu, as well as the overall Program NTG.

Table 240. Renewable Energy Competitive Incentive Program Lifecycle Net Savings and NTG

Net-of-Freeridership Savings (MMBtu)	Participant Spillover Savings (MMBtu)	Total Lifecycle Gross Verified Savings (MMBtu)	Total Lifecycle Net Savings (MMBtu)	Program Lifecycle NTG Ratio
865,323	0	930,455	865,323	93%

Table 241 shows the first-year net demand and energy impacts (kWh, kW, and therms) by measure category for the Program. The Evaluation Team attributed these savings as net of what would have occurred naturally without the presence of the Program.

Table 241. Renewable Energy Competitive Incentive Program First-Year Net Savings

Measure	First-Year Net		
	kWh	kW	therms
Geothermal	24,937	0	0
Photovoltaics	10,575,192	3,402	0
Wind Electric	13,521	27	0
Total First Year	**10,613,650**	**3,428**	**0**

Table 242 lists the lifecycle net demand and energy impacts (kWh, kW, and therms) by measure category for the Program.

Table 242. Renewable Energy Competitive Incentive Program Lifecycle Net Savings

Measure	Lifecycle Net		
	kWh	kW	therms
Geothermal	343,280	0	0
Photovoltaics	253,020,258	3,402	0
Wind Electric	248,163	27	0
Total Lifecycle	**253,611,701**	**3,428**	**0**

Process Evaluation

The Evaluation Team focused the process evaluation on these key topics:

- Program design, delivery, and management structure
- Program changes from the prior quadrennium
- Customer experience and satisfaction of the RECIP

Program Design, Delivery, and Goals

Since 2012, the Program has offered financial incentives to Wisconsin businesses for installing eligible, cost-effective, renewable energy systems through a competitive bid process. Three times a year (January, May, and September), the Program Administrator solicits proposals for renewable energy projects for solar electric, solar thermal, geothermal, biogas, and biomass, and wind. Awarded projects are processed through the specific Focus on Energy business program for which the customer is eligible (Business Incentive, Large Energy User, and Agriculture, Schools and Government).

In CY 2019, the Program Administrator awarded financial incentives to 67 business customers through the Program. Of these, 65 installed a solar electric system (solar PV), one installed a geothermal system (ground source heat pump), and one installed a wind system. Twenty-nine of the business customers came from the commercial sector, 15 from the schools and government sector, 12 from the industrial sector, eight from the agriculture sector, and three from the multifamily sector.

Program Management and Delivery Structure

The Program Administrator is responsible for issuing the RFPs, reviewing and scoring project proposals, selecting winning projects, and signing award letters. The Program Administrator scored and awarded projects based on the following criteria:

- Project's cost-effectiveness to the customer
- The impact of Focus on Energy's incentive on the project moving forward
- Reasonability of the project's savings estimates
- Engineering optimization of the system to store excess energy or align with peak demand

The Program Implementers are responsible for processing the awarded projects, following the procedures of the specific business program under which the customer falls. Procedures include verifying installed system and, in some cases, verifying the accuracy of energy-savings estimates. The customer proposes a dollar-per-kWh incentive and/or a dollar-per-therm incentive of up to $0.50 per kWh produced or up to $1.00 per therm, not to exceed 50% of total project costs. The Program Implementer calculates the amount of the customer's incentive based on the project's first-year net energy production (or offset).

Focus on Energy relies on its Trade Allies to inform customers about the Program, assist customers with developing project proposals, and help customers complete the projects that are awarded funds.

Program Changes

The Program made three major changes in CY 2019 to better serve the market.

Released RFPs on a more frequent and regular schedule. In the prior quadrennium (CY 2015 to CY 2018), the Program released RFPs about once or twice per year depending on when funding was available. Starting in CY 2019, the Program released RFPs in January, May, and September. The Program Administrator made the change to the RFP schedule for these reasons:

- Provide greater certainty to customers and Trade Allies to facilitate project planning
- Help the Program backfill with additional projects should projects awarded in earlier rounds drop out of the Program

The Program Administrator reported that Trade Allies liked the change to the RFP schedule but that project attrition was still a challenge because of uncontrollable and unexpected cancellation of awarded projects. Another challenge was that customers whose project proposals were not awarded in one round often did not submit another proposal in subsequent rounds, despite being eligible.

Awarded incentives for solar projects based on a two-tiered approach. For solar projects, the Program awarded incentives through two separate tracks:

- Standard track, for all technologies and solar projects larger than 100 kW capacity
- Mid-sized track, for smaller solar projects less than or equal to 100 kW capacity

The scoring criteria for awarding RECIP funding places much of the weight on a project's cost-effectiveness and its impacts to Focus on Energy where, historically, larger projects have scored more points than smaller projects. This change to a two-tiered approach sought to more equitably distribute funding for mid-size solar projects. The Program Administrator reported awarding its expected target of 30% to 40% of total RECIP funding each round to mid-size solar projects in CY 2019.

Streamlined the application process. To reduce the time and effort for developing and evaluating project proposals, the Program Administrator improved the application process by introducing a new online form with file attachment and spreadsheet data extraction capabilities. The Program Administrator said Trade Allies found the new online application process easier and more straightforward. The Program Administrator also said the new online process has helped save considerable time for Program staff and made the proposal scoring process easier for the reviewers.

Program Goals

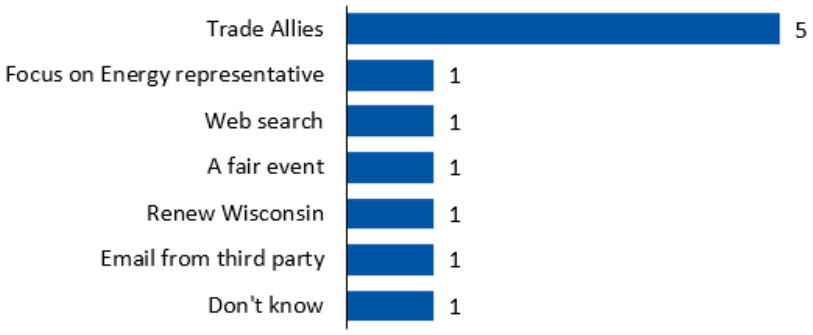
The Program has no energy-savings goals for CY 2019 and has not established goals in the past.

Marketing and Outreach

The Program Administrator did not conduct direct customer marketing and outreach activities in CY 2019, instead relying on Trade Allies for Program marketing and outreach activities. Customers could also discover the Program through a web search on renewable rebates in Wisconsin and on the Focus on Energy website.

In the CY 2019 participant interviews, five of 10 respondents said they learned about the Program through Trade Allies. As shown in Figure 145, respondents also mentioned other channels.

Figure 145. How Participants Learned about Renewable Energy Competitive Incentive Program



Source: RECIP Participant Interview Question: "How were you made aware of the RECIP call for proposals?" (n=10). Multiple answers allowed.

When asked how they would prefer to hear from Focus on Energy about future opportunities, eight of 10 respondents said email. Other preferences were Trade Allies, phone calls, and direct mail.

Customer Experience

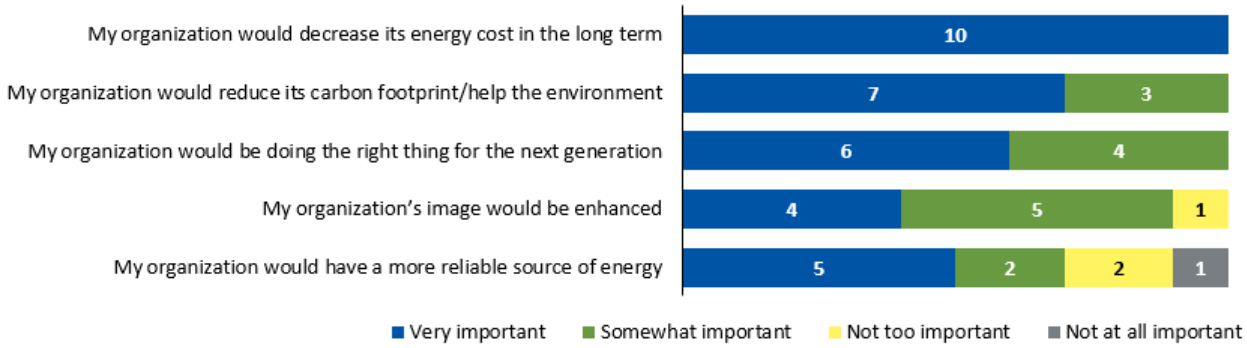
This section presents findings from the participant interviews. The Evaluation Team interviewed 10 participants who completed a renewable energy project in CY 2019. Nine installed solar PVs and one installed a ground source heat pump.

Participation Decision-Making

The Evaluation Team asked respondents to rate how important each benefit shown in Figure 146 was in their decision to install renewable energy at their facility. The financial benefit was the most important. All 10 respondents said the long-term decrease in energy costs was *very important*. Environmental and societal benefits were the second and third most important benefits, respectively. Seven respondents said reducing the carbon footprint was *very important,* and six respondents said doing the right thing for the next generation was *very important*. Four respondents said benefits to the organization's image was *very important,* and five said having a more reliable source of energy was *very important*.

When asked about the most important factors in their organization's decision to submit a RECIP proposal, respondents also mentioned financial and environmental benefits as top responses. Seven respondents specifically mentioned financial factors such as a good return on investment and saving money on energy bills. Three respondents specifically mentioned environmental and societal factors such as doing good for the environment and being a responsible community member. Two respondents said the overall feasibility of the project was an important factor.

Figure 146. Importance of Various Benefits in Participants' Decision-Making



Source: RECIP Participant Interview Question: "I'm going to read a list of benefits your organization might experience from installing renewable energy. Please tell me how important each benefit was in your initial decision to install renewable energy at your facility." (n=10).

Participation Barriers

Of 10 respondents, five found the upfront cost was the most challenging aspect of a renewable energy project, and three said getting project approvals and permits. Three participation barriers—project feasibility, timing, and personnel—received only one response each.

All but two respondents said the Program offering was *very helpful* (seven respondents) or *somewhat helpful* (one respondent) in helping them overcome these challenges. Seven respondents offered the following suggestions on how Focus on Energy could further help customers:

- Provide larger incentives (two respondents)
- Work on marketing the added value of renewables in the commercial real estate market (two respondents)
- Help with permitting (one respondent)
- Allow customers to apply for incentives after the project is complete (one respondent)
- Improve Program information and communications (one respondent)

Cost of Renewable Energy Projects and Incentive Coverage

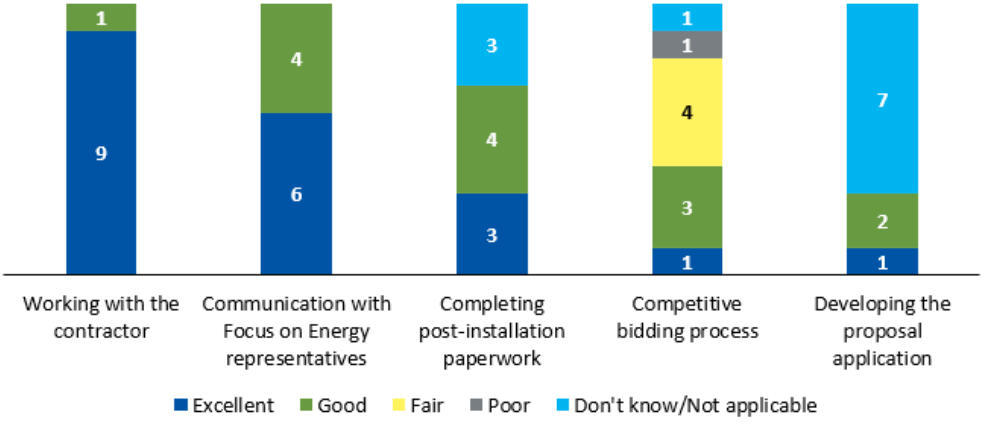
Respondents estimated that the Program incentives covered between 3% and 25% of their total project costs, with an average estimate of 13% across respondents (n=10). In dollar terms, respondents received between $3,615 and $65,837 in incentives, with an average of $25,676.

Project costs eligible for the Program incentives include the renewable system and installation labor. Additional costs such as feasibility studies, purchase of property, expenses for internal personnel, and equipment purchases or down payments made prior to the incentive payment are not eligible for incentives through the Program. Two respondents said there were additional unforeseen costs for their projects that were not eligible for Program incentives. They said they paid for additional internal wiring and landscaping.

Rating of Various Program Components

The Evaluation Team asked respondents to rate their experience (*excellent*, *good*, *fair*, or *poor*) with the Program components shown in Figure 147. All Program components received an *excellent* or *good* rating with one exception. Respondents gave an *excellent* rating to working with the contractor (nine respondents) and communications with Focus on Energy representatives (six respondents).

Figure 147. Participant Rating of Various Program Components



Source: RECIP Participant Interview Question: "I will ask you about different aspects of your participation in RECIP. Please tell me if your experience with each aspect has been excellent, good, fair, or poor. If something does not apply, please let me know." (n=10).

For the competitive bidding process, four respondents gave a *fair* rating and one respondent gave a *poor* rating. These five respondents explained that they lacked detailed information that Trade Allies knew (such as the awarding criteria) that would have helped them understand the competitive bidding process. Moreover, three of these five respondents said they developed the proposal application instead of the Trade Allies.

Overall, respondents had a positive experience with the Program. One respondent said, "Great experience from the help, incentives, feedback, and professionalism." Another respondent said, "It's a great program! It helps push people on the fence towards renewables."

When asked what Focus on Energy could do to improve the Program, seven respondents gave the following suggestions:

- Communicate Program information and processes upfront and more clearly, such as how long next steps will take and the criteria used to determine how the incentives are awarded (three respondents)
- Provide larger incentives (two respondents)
- Change to a prescriptive Program design (one respondent)
- Think outside the box to get customers motivated (one respondent)

Program Participation Benefits

Other than reducing energy bills, eight respondents identified the following energy and non-energy benefits that their organization experienced as a result of their Program participation:

- Enhanced image of organization from the public (two respondents)
- Enhanced image of organization from employees (one respondent)
- Provided job training opportunities through the installation work (one respondent)
- Reduced noise pollution (one respondent)
- Reduced solar landing and heat gain (one respondent)
- Reduced carbon footprint by not using power from utility (one respondent)
- Provided a way to promote sustainability to clients (one respondent)

Satisfaction with Focus on Energy

The 10 respondents reported high satisfaction with Focus on Energy overall. On a scale of zero to 10 where zero meant *not at all satisfied* and 10 meant *extremely satisfied*, they gave an average rating of 9.3 for their satisfaction with Focus on Energy.

Program Cost-Effectiveness

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

Table 243 lists the CY 2019 incentive costs for the Renewable Energy Competitive Incentive Program.

Table 243. Renewable Energy Competitive Incentive Program Incentive Costs

	CY 2019
Incentive Costs	$2,564,784

The Evaluation Team found that the CY 2019 Renewable Energy Competitive Incentive Program was cost-effective (1.76). Table 244 lists the evaluated costs and benefits.

Table 244. Renewable Energy Competitive Incentive Program Costs and Benefits

Cost and Benefit Category	CY 2019
Costs	
Administration Costs	$10,499
Delivery Costs	$197,990
Incremental Measure Costs	$13,446,767
Total Non-Incentive Costs	**$13,655,255**
Benefits	
Electric Benefits (kWh)	$9,482,792
Electric Benefits (kW)	$11,278,467
Gas Benefits	$0
Emissions Benefits	$3,282,255
Total TRC Benefits	**$24,043,514**
Net TRC Benefits	**$10,388,259**
TRC B/C Ratio	**1.76**

Evaluation Outcomes and Recommendations

The Evaluation Team identified the following outcomes and recommendations for the RECIP.

Outcome 1. *Ex ante* energy and demand savings for PV systems require site-specific information and deviate from deemed TRM values. The atypical realization rates of PV measures can be explained by the systemic difference between methods used to calculate *ex ante* and *ex post* savings estimates. All projects calculated *ex ante* savings using a hybrid approach. This methods required the Program Implementer to collect site-specific data (e.g., panel orientation, site location, system size, and power) and enter the data into the PVWatts software. The Evaluation Team calculated *ex post* savings estimates using the deemed per-unit TRM values based on the project location and panel orientation.

Recommendation 1. PV measures are being moved into the prescriptive approach for the 2020 program year. These prescriptive measures should reference the deemed savings values in the current TRM.

Outcome 2. The Program operated with greater ease for participants, Trade Allies, and Program staff after major changes were implemented. In CY 2019, the Program introduced a new online application process and released RFPs on a more frequent and regular schedule. The new online application form included file attachment and spreadsheet data extraction capabilities. The Program Administrator reported that the new online process saved its staff considerable time and made the proposal scoring process easier for the reviewers. The Program released RFPs three times per year in January, May, and September to provide customers and Trade Allies with greater certainty in planning projects and to secure additional projects should previously awarded projects drop out.

The Program Administrator said Trade Allies liked the change to the RFP schedule, but that project attrition remained a challenge. Moreover, the Program Administrator noted that customers whose

project proposals were not awarded in one round often did not resubmit in subsequent rounds, despite being eligible.

Recommendation 2. Consider encouraging eligible customers and their Trade Allies to resubmit their proposals. One way to encourage resubmission is to change the online application process to allow customers and Trade Allies to save and retrieve their project proposals for future resubmission. A save and retrieve feature would make resubmissions quick and simple.

Outcome 3. Program participants perceived a wide range of energy and non-energy benefits other than reducing energy bills as important in their decision-making for installing renewables. Interviewed participants identified seven energy and non-energy benefits that their organization experienced as a result of their Program participation:

- Enhanced image of the organization from the public
- Enhanced image of the organization from employees
- Job training opportunities
- Reduction in noise pollution
- Reduction in solar landing and heat gain
- Reduction in carbon footprint by not using power from the utility
- Way to promote sustainability to clients

When asked to rate how important various benefits were in their decision to install renewable energy at their facility, interviewed participants rated the financial benefit as the most important in making their decision, followed by the environmental, societal, and public image benefits.

Recommendation 3. Consider incorporating the wide range of benefits that nonresidential customers experience as a result of renewable energy installations into future marketing opportunities or case studies. Although long-term cost-saving benefits of renewable energy are still the most powerful benefit, organizations that are on the fence about a renewable energy project or need a more short-term value proposition might be encouraged by hearing about others' positive experiences unrelated to the savings in energy costs.

Small Business Program

Focus on Energy's Small Business Program encourages commercial and industrial customers with an average monthly consumption of 40,000 kWh or less during July and August to install energy-efficient products at their facilities. The Program helps customers find trained Trade Allies who can present options for upgrading equipment and installing energy-efficient products.

The Program also offers the highest incentives among Focus on Energy's business programs because small businesses often face the highest cost barriers to efficiency upgrades. Customers may receive the incentive directly for products installed or, to help reduce upfront cost barriers and payback periods, Trade Allies may receive the incentive on behalf of the customer by applying instant discounts to the invoice.

As part of PSC's initiative to enhance services to rural customers, Focus on Energy also provided the Community Small Business Offering (CSBO) in CY 2017 and CY 2018 and the CSBO Flood Relief in CY 2018. Though these offerings concluded in CY 2018, CSBO Flood Relief customers, who were qualifying small businesses located in rural FEMA designated disaster areas, were eligible to install qualifying equipment and receive a 100% bonus incentive through March 1, 2019.

APTIM is the Small Business Program Administrator and manages the overall Program and Program design. Franklin Energy is the Program Implementer and its staff serve as Energy Advisors. The Implementer executes day-to-day Program operations, such as marketing and outreach activities, data management, and incentive processing.

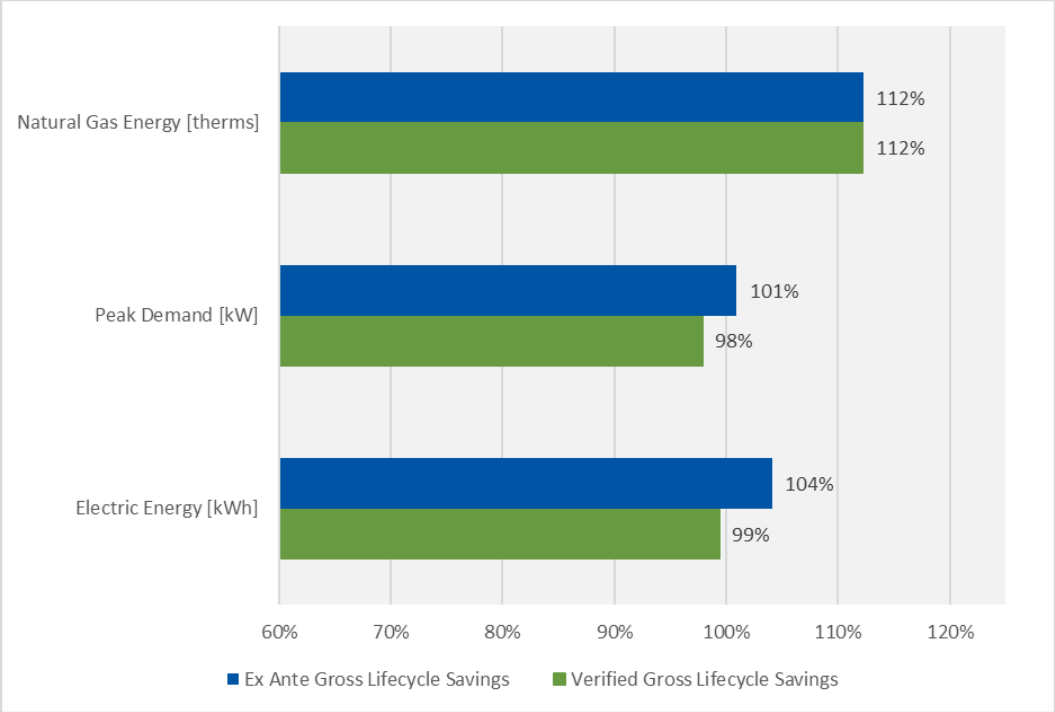
Table 245 lists actual spending, savings, participation, and cost-effectiveness for the Small Business Program and CSBO Flood Relief in CY 2018 and CY 2019.

Table 245. Small Business Program Summary

Item	Units	CY 2018	CY 2019
Incentive Spending	$	$5,798,386	$6,007,047
Participation	Number of Participants	2,888	3,125
Verified Gross Lifecycle Savings	kWh	758,972,149	727,650,093
	kW	6,725	6,575
	therms	4,156,159	6,724,993
Verified Gross Lifecycle Realization Rate	% (MMBtu)	104%	96%
Annual NTG Ratio	% (MMBtu)	91%	91%
Net First-Year Savings	kWh/year	52,375,500	49,680,184
	kW	6,139	5,984
	therms/year	220,432	352,974
Net Lifecycle Savings	MMBtu	2,740,880	2,866,741
Cost-Effectiveness	Total Resource Cost Test: Benefit/Cost Ratio	4.71	4.05

Figure 148 shows the percentage of gross lifecycle savings goals achieved by the Small Business Program in CY 2019. The Program exceeded its electrical savings goals and gas savings goals.

Figure 148. Small Business Program Achievement of CY 2019 Gross Lifecycle Savings Goals



The Program Implementer is required to meet a gross lifecycle MMBtu goal in addition to fuel-specific savings targets.

Evaluation, Measurement, and Verification Approach

In CY 2019, the Evaluation Team conducted an impact evaluation of the Small Business Program and completed a limited process evaluation based on results from Cadmus' ongoing participant satisfaction survey and the Program Administrator's online Trade Ally survey. Table 246 lists specific data collection activities and sample sizes used in the evaluations.

Table 246. CY 2019 Data Collection Activities and Sample Sizes

Activity	CY 2019 Sample Size (n)
Tracking Database Review	Census
Ongoing Participant Satisfaction Surveys	724
Trade Ally Surveys [a]	20
Engineering Desk Reviews	68
Verification Site Visits	33

[a] The Program Administrator designed and administered the CY 2019 Trade Ally survey for nine residential and commercial programs. Cadmus analyzed the responses of Small Business Trade Allies for this evaluation.

Tracking Database Review

The Evaluation Team reviewed a census of Program projects in Focus on Energy's tracking database, SPECTRUM. This involved the following tasks:

- Thoroughly review the data to ensure that SPECTRUM totals matched totals reported by the Program Administrator
- Reassign savings from database adjustment measures to the corresponding Program measures
- Check for complete and consistent application of information across data fields (such as measure names, application of lifetime savings, application of effective useful life [EUL])

Ongoing Participant Satisfaction Surveys

The PSC requested that the Evaluation Team conduct satisfaction surveys beginning in CY 2019 for the CY 2019-CY 2022 quadrennium, continuing the practice established for the previous quadrennium in CY 2015. There were two objectives for these satisfaction surveys:

- Understand customer satisfaction on an ongoing basis and respond to any changes in satisfaction before the end of the annual reporting schedule
- Help to facilitate timely follow-up with customers to clarify and address service concerns

The Team used SPECTRUM data to sample CY 2019 participants and administer web-based satisfaction surveys throughout the year. The Team supplemented these surveys with mailed paper surveys sent to participants without email addresses on file. The Team combined results from both modes to conduct the analysis. In total, 724 Small Business Program participants responded to the CY 2019 survey regarding several topics, such as the following:

- Overall satisfaction
- Satisfaction with Program staff and Trade Allies
- Likelihood of recommending the Program
- Likelihood of initiating another energy efficiency improvement
- Open feedback regarding the Program (comments and suggestions)

Trade Ally Surveys

In CY 2019, APTIM invited 140 Small Business Program Trade Allies to complete an online survey designed to obtain information about the following topics:

- Assess Trade Ally satisfaction with specific program components
- Gauge usefulness of a future Trade Ally portal
- Understand how Trade Allies take advantage of and rely on Program incentives
- Assess interest in training sessions
- Identify potential new measures

The Evaluation Team analyzed the results of the 20 Trade Allies who completed the survey.

Engineering Desk Review

The Evaluation Team reviewed all available project documentation in SPECTRUM for a sample of 68 measures (57 Small Business Program measures and 11 CSBO Flood Relief measures). This review included an assessment of the savings calculations and methodology applied by the Program Implementer. The Team relied on the applicable TRMs and other relevant secondary sources as needed. Secondary sources included energy codes and standards, case studies, and evaluations of comparable measures from other energy efficiency programs (based on geography, sector, measure application, and date of issue).

To determine methodology and data for prescriptive measures in Wisconsin, the Team used Focus on Energy TRM and associated workpapers as the primary sources in nearly all cases. For hybrid and custom measures, the Team reviewed the SPECTRUM savings analysis workbooks and adjusted inputs and methodologies as necessary based on engineering judgment and project documentation. The Team selected the evaluation sample for these reviews using probability proportional to size (PPS), a weighted, random stratified sampling approach where size is based on *ex ante* lifecycle total energy savings.

Verification Site Visits

In CY 2019, the Team conducted 33 verification site visits (28 Small Business Program measures and five CSBO measures). Site visits involved verifying the type and quantity of equipment installed, determining how the installed equipment is controlled, and documenting the operating hours of the installed equipment. The Team verified the savings calculation input parameters based on operational and occupancy schedules, claimed and observed setpoints, trend data, utility data, and any other relevant details identified prior to or upon arrival at the site.

Impact Evaluation

The Evaluation Team used the following approaches to measure the impact of the Small Business Program:

- Tracking database review
- In-service rate determination
- Engineering desk reviews
- Verification site visits

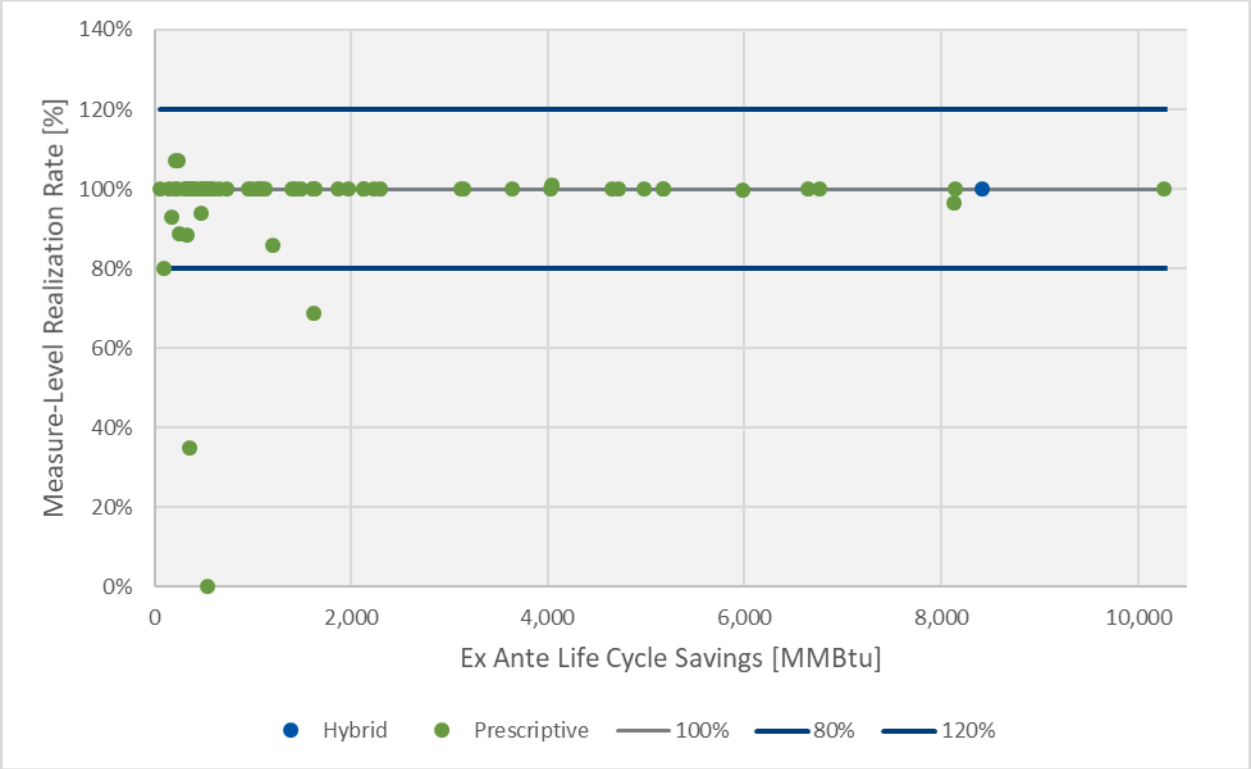
Evaluation of Gross Savings

The Team used the CY 2019 tracking data to gather reported installations then applied the results from engineering desk reviews (n=68) and verification site visits (n=33) to determine verified gross savings. The sampled projects represent 4% of the Small Business Program lifecycle MMBtu savings.

Figure 149 represents the magnitude and associated realization rates for reported MMBtu savings among sampled projects. The majority of sampled projects have realization rates ranging from 80% to

120%. Three projects had realization rates below 80%. Specific details related to these projects can be found in *Appendix H*.

Figure 149. Small Business Program Sample Results



Verified Gross Savings Results

Table 247 lists the first-year and lifecycle realization rates for the CY 2019 Program. Overall, the Program achieved a first-year evaluated realization rate of 97%, weighted by total (MMBtu) energy savings. Adjustments for EUL drive the difference between first-year and lifecycle realization rates. The totals presented in this report are derived using *ex ante* savings weighting of the realization rates of a sample of projects chosen using the probability proportional to size sampling approach.

Table 247. CY 2019 Small Business Program First-Year and Lifecycle Realization Rates

Measure	First-Year Realization Rate				Lifecycle Realization Rate		
	kWh	kW	therms	MMBtu	kWh	therms	MMBtu
Total	97%	97%	100%	97%	95%	100%	96%

Table 248 lists *ex ante* and verified first-year gross savings for the Program for CY 2019 by measure type.

Table 248. CY 2019 Small Business Program First-Year Gross Savings Summary

Measure	*Ex Ante* Gross First Year			Verified Gross First Year		
	kWh	kW	therms	kWh	kW	therms
Aeration	79,531	0	2,274	77,041	0	2,274
Air Sealing	0	0	28,697	0	0	28,697
Boiler	0	0	174,153	0	0	174,153
Compressor	48,642	20	0	47,119	19	0
Controls	5,786,055	273	48,512	5,604,930	265	48,512
Delamping	735,541	146	0	712,516	142	0
Dishwasher, Commercial	4,900	0	1,035	4,747	0	1,035
Dryer	6,945	1	0	6,728	1	0
Energy Recovery	-131	1	2,152	-127	1	2,152
Fryer	0	0	1,887	0	0	1,887
Furnace	125,861	25	72,359	121,921	24	72,359
Griddle	0	0	200	0	0	200
Infrared Heater	0	0	2,605	0	0	2,605
Light Emitting Diode (LED)	43,490,500	5,554	0	42,129,087	5,385	0
Motor	5,235,358	607	0	5,071,472	588	0
Other	14,123	1	0	13,681	1	0
Oven	2,083	0	312	2,018	0	312
Packaged Terminal Unit (PTAC, PTHP)	403,368	17	0	390,741	17	0
Pre-Rinse Sprayer	0	0	26	0	0	26
Refrigerated Case Door	31,232	6	3,616	30,254	6	3,616
Refrigerator/Freezer - Commercial	1,486	0	0	1,439	0	0
Rooftop Unit/Split System A/C	102,375	54	42,673	99,170	52	42,673
Strip Curtain	25,515	3	0	24,716	3	0
Unit Heater	0	0	4,527	0	0	4,527
Variable Speed Drive	264,731	74	0	256,444	71	0
Water Heater	-300	0	2,857	-291	0	2,857
Total First Year	**56,357,815**	**6,781**	**387,884**	**54,593,609**	**6,575**	**387,884**

Table 249 lists *ex ante* and verified gross lifecycle savings by measure type for the Program in CY 2019.

Table 249. CY 2019 Small Business Program Lifecycle Gross Savings Summary

Measure	*Ex Ante* Gross Lifecycle			Verified Gross Lifecycle		
	kWh	kW	therms	kWh	kW	therms
Aeration	788,730	0	22,108	752,863	0	22,107
Air Sealing	0	0	544,720	0	0	544,686
Boiler	0	0	3,482,930	0	0	3,482,712
Compressor	729,628	20	0	696,448	19	0
Controls	68,390,142	273	465,314	65,280,122	265	465,285
Delamping	7,355,842	146	0	7,021,337	142	0
Dishwasher, Commercial	49,000	0	10,350	46,772	0	10,349
Dryer	104,180	1	0	99,442	1	0
Energy Recovery	-1,965	1	28,607	-1,876	1	28,605
Fryer	0	0	22,644	0	0	22,643

Measure	*Ex Ante* Gross Lifecycle			Verified Gross Lifecycle		
	kWh	kW	therms	kWh	kW	therms
Furnace	2,265,363	25	1,302,389	2,162,347	24	1,302,308
Griddle	0	0	2,400	0	0	2,400
Infrared Heater	0	0	39,075	0	0	39,073
Light Emitting Diode (LED)	589,949,304	5,554	0	563,121,548	5,385	0
Motor	80,309,505	607	0	76,657,455	588	0
Other	208,810	1	0	199,314	1	0
Oven	24,998	0	3,744	23,861	0	3,744
Packaged Terminal Unit (PTAC, PTHP)	6,050,520	17	0	5,775,375	17	0
Pre-Rinse Sprayer	0	0	130	0	0	130
Refrigerated Case Door	468,480	6	54,240	447,176	6	54,237
Refrigerator/Freezer - Commercial	17,832	0	0	17,021	0	0
Rooftop Unit/Split System A/C	1,535,623	54	640,095	1,465,791	52	640,055
Strip Curtain	102,060	3	0	97,419	3	0
Unit Heater	0	0	67,912	0	0	67,908
Variable Speed Drive	3,971,126	74	0	3,790,540	71	0
Water Heater	-3,000	0	38,755	-2,864	0	38,753
Total Lifecycle	**762,316,177**	**6,781**	**6,725,413**	**727,650,093**	**6,575**	**6,724,993**

Evaluation of Net Savings

The Evaluation Team did not perform any new NTG evaluation activities in CY 2019 and therefore did not calculated new freeridership or spillover estimates.

Verified Net Savings Results

The Evaluation Team applied the lifecycle MMBtu weighted historical average of the NTG ratios from CY 2015, CY 2016, and CY 2018 to the verified gross savings for CY 2019 to determine net savings. This yielded an overall NTG estimate of 91% for the Program in CY 2019.[103] Table 250 shows the weighted historical average NTG ratio as well as the total lifecycle gross and net savings.

Table 250. Small Business Program Lifecycle Net Savings and NTG

Total Lifecycle Gross Verified Savings (MMBtu)	Total Lifecycle Net Savings (MMBtu)	Program First-Year NTG Ratio
3,150,264	2,866,741	91%

Table 251 shows the first-year net demand and energy impacts (kWh, kW, and therms) by measure category for the Program. The Evaluation Team attributed these savings as net of what would have occurred naturally without the presence of the Program.

[103] The Evaluation Team did not perform NTG evaluation activities in CY 2017.

Table 251. Small Business Program First-Year Net Savings

Measure	First-Year Net		
	kWh	kW	therms
Aeration	70,108	0	2,069
Air Sealing	0	0	26,114
Boiler	0	0	158,479
Compressor	42,879	17	0
Controls	5,100,486	241	44,146
Delamping	648,389	129	0
Dishwasher, Commercial	4,319	0	942
Dryer	6,122	1	0
Energy Recovery	-115	1	1,958
Fryer	0	0	1,717
Furnace	110,948	22	65,846
Griddle	0	0	182
Infrared Heater	0	0	2,371
Light Emitting Diode (LED)	38,337,470	4,901	0
Motor	4,615,040	535	0
Other	12,450	1	0
Oven	1,836	0	284
Packaged Terminal Unit (PTAC, PTHP)	355,574	15	0
Pre-Rinse Sprayer	0	0	24
Refrigerated Case Door	27,531	5	3,291
Refrigerator/Freezer - Commercial	1,310	0	0
Rooftop Unit/Split System A/C	90,245	48	38,832
Strip Curtain	22,492	3	0
Unit Heater	0	0	4,120
Variable Speed Drive	233,364	65	0
Water Heater	-264	0	2,600
Total First Year	**49,680,184**	**5,984**	**352,974**

Table 252 lists the lifecycle net demand and energy impacts (kWh, kW, and therms) by measure category for the Program.

Table 252. Small Business Program Lifecycle Net Savings

Measure	Lifecycle Net		
	kWh	kW	therms
Aeration	685,105	0	20,117
Air Sealing	0	0	495,664
Boiler	0	0	3,169,268
Compressor	633,768	17	0
Controls	59,404,911	241	423,409

Measure	Lifecycle Net		
	kWh	kW	therms
Delamping	6,389,417	129	0
Dishwasher, Commercial	42,562	0	9,418
Dryer	90,492	1	0
Energy Recovery	-1,707	1	26,031
Fryer	0	0	20,605
Furnace	1,967,735	22	1,185,100
Griddle	0	0	2,184
Infrared Heater	0	0	35,556
Light Emitting Diode (LED)	512,440,608	4,901	0
Motor	69,758,284	535	0
Other	181,376	1	0
Oven	21,714	0	3,407
Packaged Terminal Unit (PTAC, PTHP)	5,255,591	15	0
Pre-Rinse Sprayer	0	0	118
Refrigerated Case Door	406,930	5	49,355
Refrigerator/Freezer - Commercial	15,489	0	0
Rooftop Unit/Split System A/C	1,333,870	48	582,450
Strip Curtain	88,651	3	0
Unit Heater	0	0	61,796
Variable Speed Drive	3,449,392	65	0
Water Heater	-2,606	0	35,265
Total Lifecycle	**662,161,585**	**5,984**	**6,119,743**

Process Evaluation

The Evaluation Team conducted a limited process evaluation in CY 2019. The Evaluation Team summarized Small Business Trade Ally satisfaction and program experience from the online survey fielded by the Program Administrator in 2019. The Team also assessed participant satisfaction with the Program.

Program Design, Delivery, and Goals

Through the CY 2019 Small Business Program, Focus on Energy offered customers the following to offset barriers to participation cost and to encourage greater energy efficiency among customers:

- A variety of prescriptive downstream incentives for energy-efficient products
- Incentive levels approximately 30% or more above other Focus on Energy business programs
- Opportunity for direct installation of products by a Trade Ally (customer-hired)

In CY 2018, the Community Small Business Offering was discontinued but CSBO Flood Relief incentives were still available for eligible customers who installed projects through March 1, 2019. In addition to higher incentives, the CSBO Flood Relief offering provided participants with free energy assessments

and energy-saving kits. The customer was required to complete the free energy assessment to receive an energy-saving kit. Table 253 lists the four kit types and their contents.

Table 253. Community Small Business Offering Kit Measures

Kit Type	Measures
Restaurant Kit	9W LED, bathroom aerator, exit light retrofit, kitchen aerator, pre-rinse spray valve
Retail Kit	9W LED, bathroom aerator, exit light retrofit, BR30 LED
Office Kit	9W LED, bathroom aerator, exit light retrofit, kitchen aerator, APS
All Electric Kit	9W LED, BR30 LED, APS

Program Management and Delivery Structure

The Small Business Program Administrator manages overall Program and Program design. The Program Implementer, along with its staff of Energy Advisors executed the day-to-day Program operations, such as marketing and outreach activities, data management, and incentive processing.

Wisconsin utilities contributed to marketing and outreach activities and provided support to Trade Allies. Trade Allies were the Program's main marketing channel and were responsible for educating and promoting the Program to customers, setting up projects, and installing products.

Energy Advisors reviewed the work completed by Trade Allies for quality assurance and provided technical support to Trade Allies and Utility Partners. Energy Advisors also worked directly with customers.

Program Goals

The Program's overall objective is to encourage businesses to use more energy-efficient products. For CY 2019, Focus on Energy set the following savings goals:[104]

- Demand reduction of 5,905 kW
- Lifecycle electric savings of 649,608,992 kWh
- Lifecycle natural gas savings of 5,713,340 therms

In CY 2019, the Program exceeded its electric, gas, and demand goals.

Annual Results from Ongoing Participant Satisfaction Survey

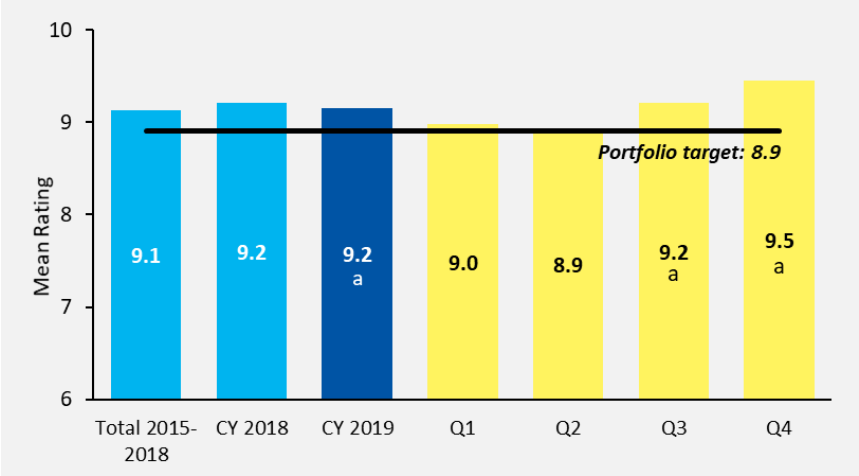
Throughout CY 2019, the Program Administrator and Evaluation Team surveyed participants to measure their satisfaction with various aspects of the Small Business Program. Respondents answered

[104] Metrics presented in this section represent Focus on Energy's targets for the Program, and not contractual goals for the Program Implementer. The Program Implementer is required to meet a gross lifecycle MMBtu goal in addition to fuel-specific savings targets.

satisfaction and likelihood questions on a scale of 0 to 10, where 10 indicated the highest satisfaction or likelihood and 0 the lowest.[105]

Figure 150 shows that the average overall satisfaction rating with the Program was 9.2 among CY 2019 participants, which was significantly higher than the portfolio target of 8.9 and equivalent to ratings from CY 2018 participants (9.2).[106] Ratings from Q3 and Q4 were also significantly higher than the portfolio target, while ratings from Q1 and Q2 were statistically equivalent to the target.[107]

Figure 150. CY 2019 Overall Participant Satisfaction with the Small Business Program



Source: Small Business Program Ongoing Participant Satisfaction Survey Question. "Overall, how satisfied are you with the Program?" (CY 2018 n=461, CY 2019 n=720, Q1 n=158, Q2 n=190, Q3 n=134, Q4 n=213). Total CY 2015–CY 2018 is the participation-weighted average of four annual results.

[a] Denotes that the result for the year or quarter is statistically significant different from the portfolio target ($p<0.10$ or better using binomial t-tests).

Table 254 shows the average Small Business Program satisfaction and likelihood ratings for CY 2019 and CY 2018. In CY 2019, ratings for Trade Allies (9.5) were statistically higher than CY 2018 (9.2), while all other ratings were statistically equivalent to CY 2018.

[105] The number of participants who completed a survey does not always match the number of responses for each question because some participants skipped questions, did not know answers to questions, or did not qualify to answer questions based on previous answers or other known data about the participant.

[106] The Program Administrator's contract established a portfolio target of 8.9 to maintain or increase customer satisfaction.

[107] The Evaluation Team found that some surveys did not include identifying information to allow it to match survey responses to program participation dates. Survey responses without participation dates were included in the year-end total but not the quarterly breakdown.

Table 254. CY 2019 Average Participant Ratings for Small Business Program

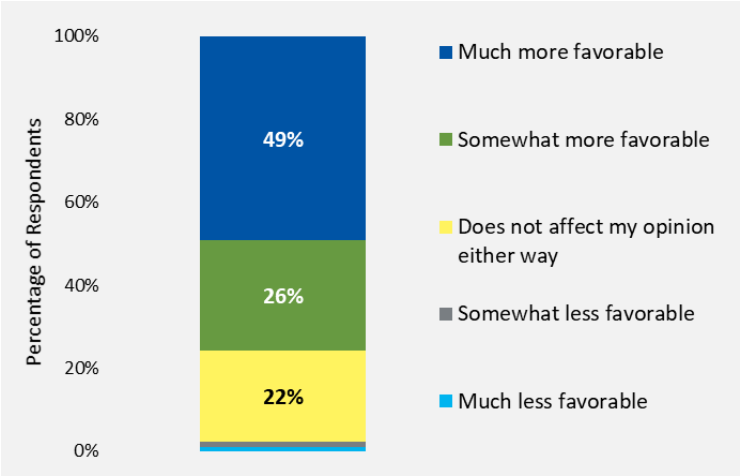
Item	CY 2018	CY 2018
Satisfaction with Energy Advisors	9.3	9.3
Satisfaction with Trade Ally	9.2	9.5 [a]
Likelihood of more improvements	7.6	7.3
Likelihood of recommending the Program	9.5	9.4

[a] This result is statistically significantly different from the result for CY 2018 ($p<0.05$ using a binomial t-test).

Using these survey data, the Evaluation Team calculated a Net Promoter Score (NPS) based on customers' likelihood to recommend the Small Business Program. The NPS is expressed as an absolute number between -100 and +100 that represents the difference between the percentage of promoters (respondents giving a rating of 9 or 10) and detractors (respondents giving a rating of 0 to 6). The Small Business Program NPS was +83 for CY 2019 which identical to the +83 NPS in CY 2018.

Small Business Program participants were asked if Focus on Energy offerings affected their opinion of their utilities, and nearly half (49%) gave the highest rating of *much more favorable* (Figure 151). Only 22% said their opinion was not affected, and 2% of survey respondents reported that their opinion of their utility had become less favorable.

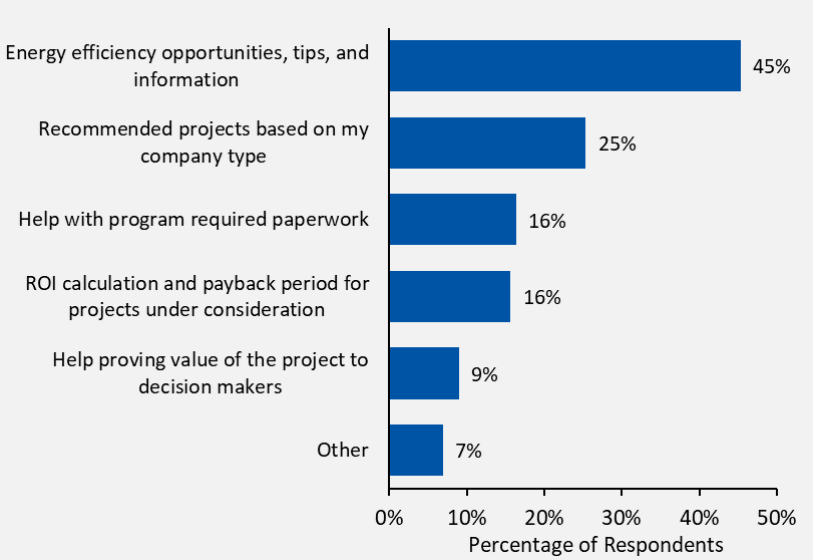
Figure 151. Effect of Focus on Energy Offerings on Participants' Opinion of Utilities



Source: Small Business Program Ongoing Participant Satisfaction Survey Question. "Your energy utility partners with Focus on Energy to offer energy efficiency programs to its customers. How have these offerings affected your opinion of your utility, if at all?" (n=658)

Survey respondents identified how Focus on Energy can best support their organization with future projects (Figure 152). The most frequent responses from Small Business Program participants were energy efficiency opportunities, tips, and information (45%) and company-specific recommendations for projects (25%).

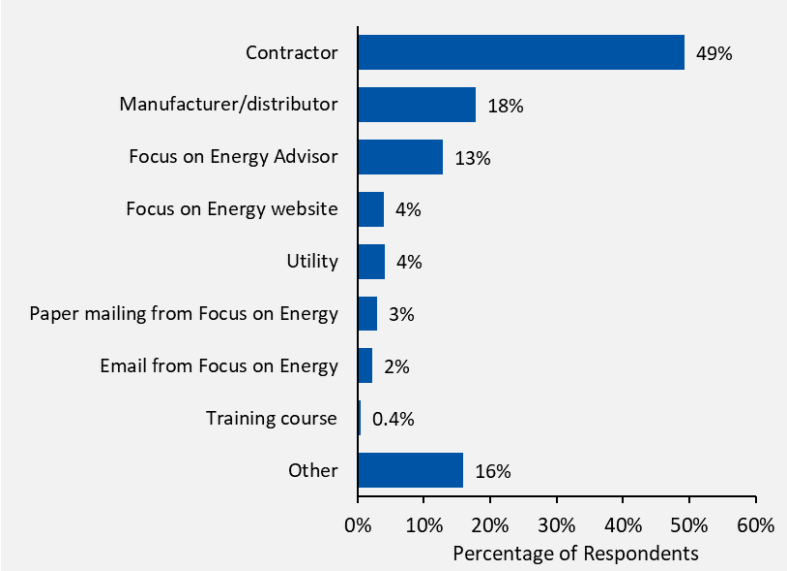
Figure 152. CY 2019 Participants' Most Valued Support



Source: Small Business Program Ongoing Participant Satisfaction Survey Question. "Aside from providing project incentive dollars, how can Focus on Energy best support your organization going forward?" (n=690). Responses total to more than 100% because multiple responses were allowed.

About half of Small Business Program participants learned about the Program from contractors (49%), followed by manufacturers and distributors (18%) and Focus on Energy advisors (13%; Figure 153).

Figure 153. CY 2019 Participant Sources of Program Awareness



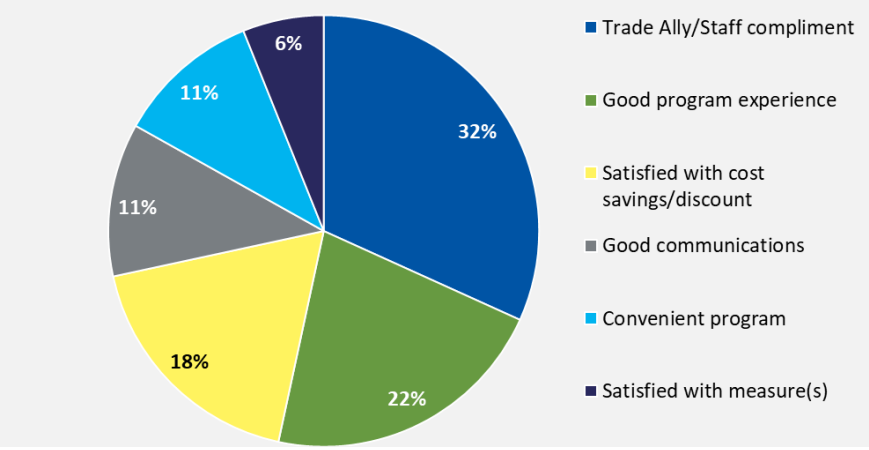
Source: Small Business Program Ongoing Participant Satisfaction Survey Question. "How did you learn about this particular opportunity from Focus on Energy?" (n=680). Responses total to more than 100% because multiple responses were allowed.

Suggestions for Improvement

At the conclusion of the ongoing participant satisfaction survey, respondents answered whether they had any additional comments or suggestions for improving the Program. Of the 724 Small Business Program participants who responded to the survey, 26% provided open-ended feedback, which the Evaluation Team coded into a total of 244 mentions. Of these mentions, 148 were positive or complimentary comments (61%), and 96 were suggestions for improvement (39%).

The positive responses are shown in Figure 154. Most of these comments complimented Trade Allies and Focus on Energy staff (32%) or reflected a generally positive Program experience (22%), which were also the top two categories for positive comments in CY 2018.

Figure 154. CY 2019 Participant Positive Comments About the Small Business Program

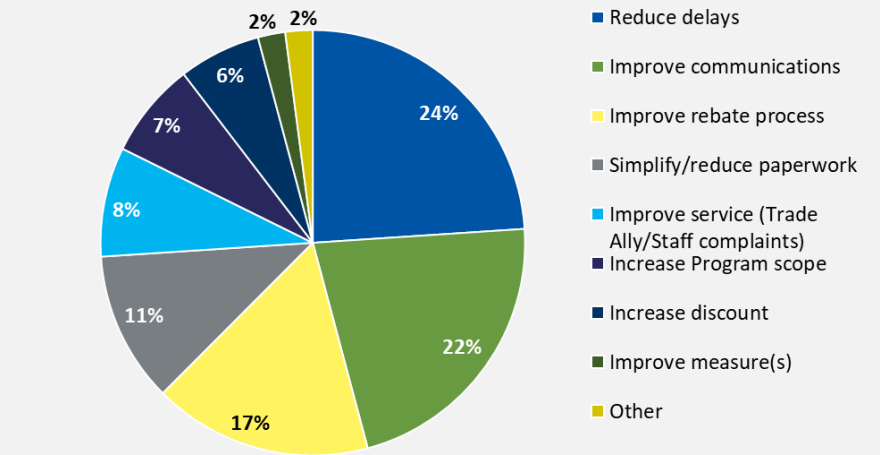


Source: Small Business Program Ongoing Participant Satisfaction Survey Question. "Please tell us more about your experience and any suggestions." (Total positive mentions n=148)

Suggestions for improvement are shown in Figure 155. The most frequent of these suggestions were to reduce delays (24%), improve communications (22%), and improve the rebate process (17%). These were also the top three suggestion categories in CY 2018, in the same order with similar percentages.

Participant suggestions to improve communications in CY 2019 focused on the same topics as CY 2018 suggestions: making information on which measures qualify for discounts more readily available, receiving a confirmation email once an application has been submitted, and increasing awareness for the Program through more outreach and marketing. Participant suggestions to improve the rebate process focused on ensuring correct rebate amounts for qualifying products are communicated to the customer and streamlining the application process.

Figure 155. CY 2019 Participant Suggestions for Improving the Small Business Program



Source: Small Business Program Ongoing Participant Satisfaction Survey Question. "Please tell us more about your experience and any suggestions." (Total suggestions for improvement mentions n=96)

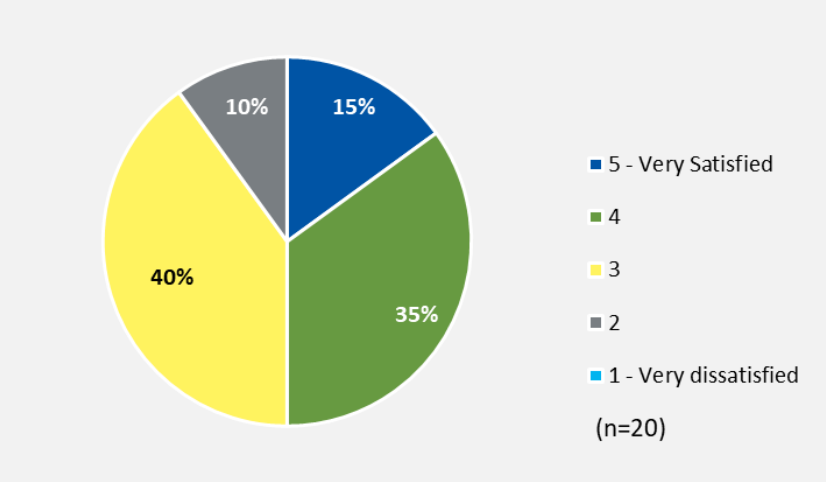
Trade Ally Experience

The Program Administrator emailed an online survey to 140 Small Business Program Trade Allies who had received an incentive (or whose customer had received an incentive) in CY 2019. From this population, the Program Administrator received completed surveys from 20 Trade Allies (a 14% response rate) who provided feedback about their program experience. Of these Trade Allies, 80% said they provide electrical or electrical-related services through the program, 15% identified themselves as retailer/distributors, and 5% said they provide building services.

Satisfaction with Focus on Energy

Half of the respondents said they were satisfied with Focus on Energy overall. Figure 156 shows that 50% of the respondents provided a rating of 4 or 5, using a 1 to 5 scale in which 1 is *very dissatisfied* and 5 is *very satisfied*. None of the respondents indicated they were *very dissatisfied*. Of the eight respondents who offered an explanation for their rating, six were dissatisfied with the size or speed of the incentive payment.

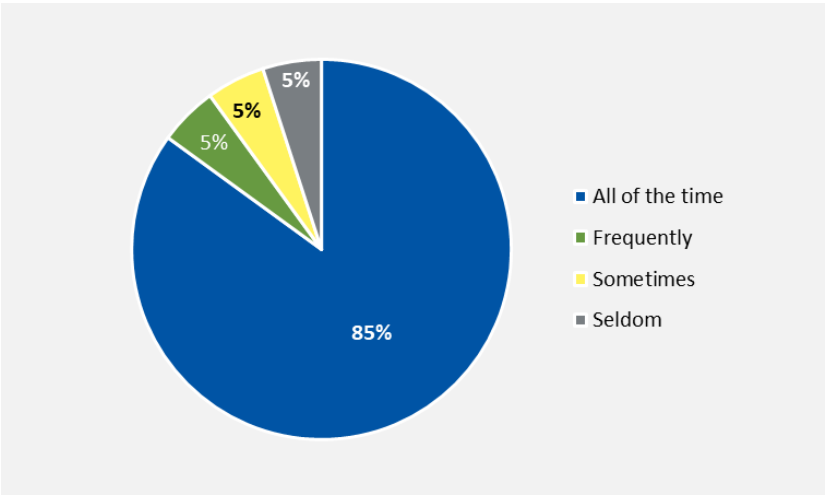
Figure 156. Overall Satisfaction with Focus on Energy



Source: CY 2019 Trade Ally Surveys Question "Overall, how satisfied are you with Focus on Energy? (Scale 1-5, where 1=very dissatisfied and 5 = very satisfied)." (n=20)

When asked how often they promote or include Focus on Energy incentives in their project proposals, most respondents (85%) said they do so *all of the time* (Figure 157).

Figure 157. Program Incentive Promotion

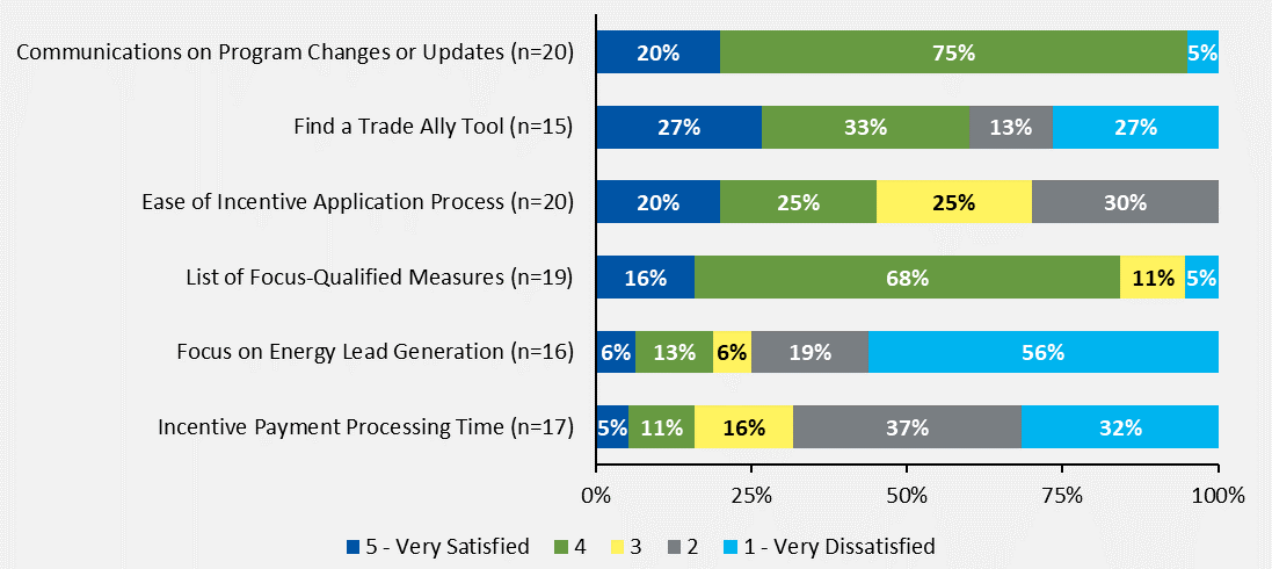


Source: CY 2019 Trade Ally Survey Question "During the last year, how often did you promote or include Focus on Energy incentives in your project proposals?" (n=20)

When asked to rate their satisfaction with five specific aspects of the program, responses varied. Communications on program changes or updates received the greatest number of *very satisfied* or

satisfied ratings. Respondents were least satisfied with Focus on Energy lead generation and incentive payment processing times (Figure 158).[108]

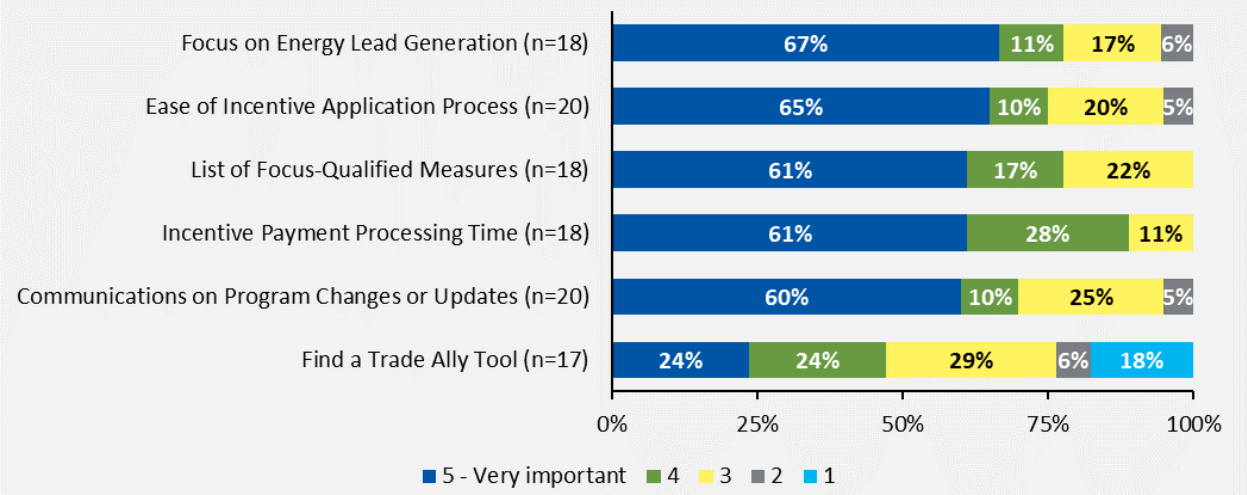
Figure 158. Trade Ally Satisfaction with Program Aspects



Source: CY 2019 Trade Ally Survey Question "Overall, how satisfied are you with…?"

When asked about the importance of each of these program aspects, respondents most often rated focus on energy lead generation as *very important* and the find a trade ally tool of least importance (Figure 159).

Figure 159. Trade Ally Importance of Program Aspects



Source: CY 2019 Trade Ally Survey Question "How important is…"

[108] It is possible some Trade Allies misinterpreted this survey prompt, which was intended to determine whether Focus on Energy generally helped with lead generation in general. Focus on Energy does not directly provide Trade Allies with customer leads.

Trade Ally Portal Preferences

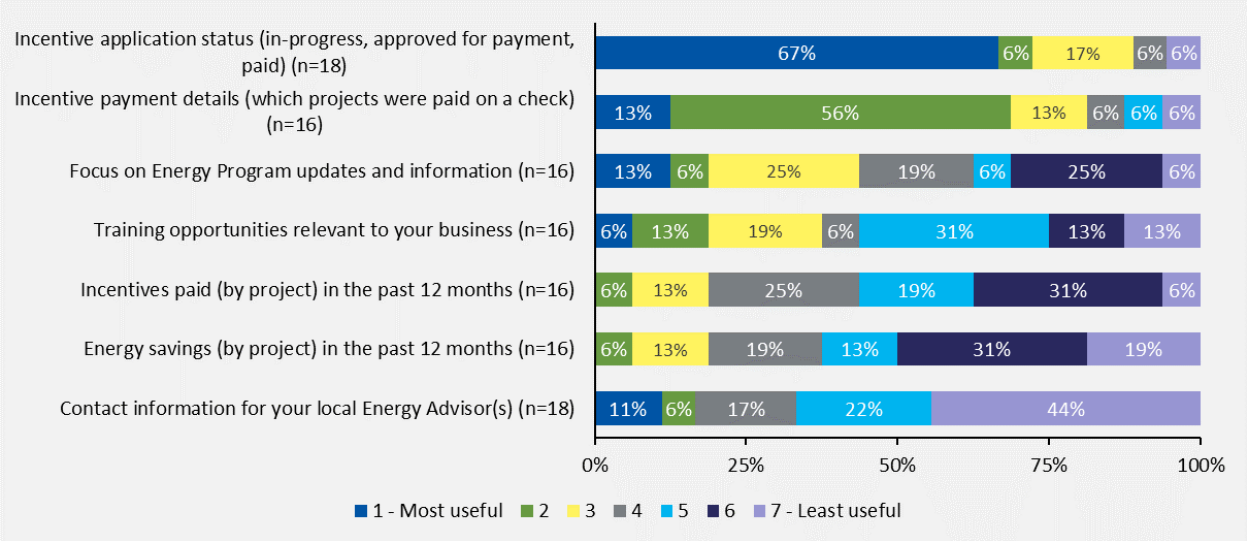
Trade Allies were asked to rank the type of information they would find most useful should an online Trade Ally Portal be made available. Table 255 shows the aspects of a Trade Ally portal from most useful (1) to least useful (7), based on mean responses.

Table 255. Most Useful Information for Trade Ally Portal

Average Rank	Online Trade all Portal Information
1	Incentive application status (in-progress, approved for payment, paid)
2	Incentive payment details (which projects were paid on a check)
3	Focus on Energy Program updates and information
4	Training opportunities relevant to your business
5	Incentives paid (by project) in the past 12 months
6	Energy Savings (by project) in the past 12 months
7	Contact information for your local Energy Advisor(s)

Figure 160 shows the percentage of respondents who provided each aspect a ranking of 1 through 7. This chart demonstrates the variability in how individual Trade Allies view these aspects. For example, though "Contact information for your local Energy Advisor(s)" was rated the least useful aspect of the portal on average, two respondents (11%) ranked it as the most important feature.

Figure 160. Online Trade Ally Portal Information Preferences



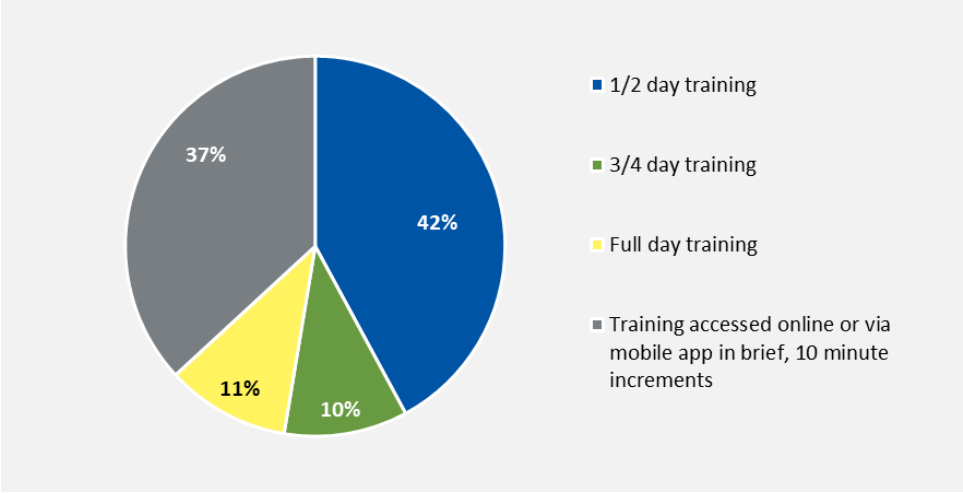
Source: CY 2019 Trade Ally Survey Question "If Focus on Energy were to provide your company with access to an online Trade Ally Portal, what information would you find most useful to have available? Please rank the following features in order of usefulness to you, where 1 is the MOST useful, and 7 is the LEAST useful…."

Interest in Training

Focus on Energy offers training to Trade Allies and customers throughout the year. When asked what type of training would be most beneficial to them, the 18 Trade Allies who responded were split equally (six each) across sales training, technical training, and Focus on Energy program training. When asked about the duration of training they or their staff would be most likely to attend, of the 19 who responded, 42% said they would be more likely to attend half-day training sessions, closely followed by preference for short online training sessions (Figure 161).

Sixteen Trade Allies said they were willing to travel up to 100 miles to attend training. One was willing to travel 100 to 200 miles, and one was unwilling to travel for training.

Figure 161. Trade Ally Training Duration



Source: CY 2019 Trade Ally Survey Question "How important is…?" (n=19)

Program Cost-Effectiveness

Evaluators commonly use cost-effectiveness tests to compare the benefits and costs of a demand-side management offering. The benefit/cost test used in Wisconsin is a modified version of the total resource cost (TRC) test. *Appendix F* includes a description of the TRC test. Table 256 lists the CY 2019 incentive costs for the Small Business Program.

Table 256. Small Business Program Incentive Costs

	CY 2019
Incentive Costs	$6,007,047

The Evaluation Team found that the CY 2019 Small Business Program was cost-effective (4.05). Table 257 lists the evaluated costs and benefits.

Table 257. Small Business Program Costs and Benefits

Cost and Benefit Category	CY 2019
Costs	
Administration Costs	$112,523
Delivery Costs	$2,396,517
Incremental Measure Costs	$10,285,797
Total Non-Incentive Costs	**$12,794,837**
Benefits	
Electric Benefits (kWh)	$21,235,316
Electric Benefits (kW)	$10,059,430
Gas Benefits	$3,165,060
Emissions Benefits	$9,576,997
Total TRC Benefits	**$44,036,803**
Net TRC Benefits	**$31,241,966**
TRC B/C Ratio	**4.05**

Evaluation Outcomes and Recommendations

The Evaluation Team identified the following outcomes and recommendations for improving the Small Business Program.

Outcome 1. The Small Business Program is performing very well and exceeded all goals. The Evaluation Team's desk reviews and site visits uncovered several minor discrepancies that led to a realization rate less than 100%. These issues included incorrect EUL values assigned to some measures in SPECTRUM and either uninstalled or nonoperating rebated lamps and equipment or controls on site. To improve the accuracy of *ex ante* savings, Evaluation Team identified several recommendations.

Recommendation 1. If creating duplicate master measure IDs is necessary in the future (as was historically the case to enable the payment of a specific incentive rate for the Community Small Business Offering), an alternate method, such as adding an incentive rate column in SPECTRUM (in addition to the standard rate) or using a separate bonus measure to increase the incentive, would help avoid the confusion of tracking updates to two separate master measure IDs when TRM inputs are updated.

Recommendation 2. The Program Implementer should consider providing directions to state clearly that spare lamps/fixtures/equipment should not be counted toward the incentive savings calculations and invoices should identify the number of spares. This would reduce savings discrepancies stemming from verification site visits in the future.

Recommendation 3. The Project Implementer should perform a verification after the project is fully installed and operational to ensure complete implementation before the incentive is finalized. This would reduce savings discrepancies stemming from verification site visits in the future. Though verification of 100% of projects would be cost-prohibitive, the Project Implementer should consider expanding its verification activities, particularly for hybrid projects where calculated energy savings are dependent on specific operating parameters.

Outcome 2. The Program has successfully engaged and supported Trade Allies, as demonstrated by the increased satisfaction ratings provided by participants, as well as the high ratings given for the Program by the Trade Allies. This success may be expanded through additional Trade Ally support, focused on three key areas identified by the Trade Allies: lead generation, portal preferences, and training preferences.

Recommendation 4. Trade Allies indicated a few preferences that could help refine their experience with, and usefulness of, the Program and should be considered for future programs. Because Trade Allies find that driving business is the most important aspect of the Program, the Program may consider additional ways to help them reach and follow-up with customers. Once the Trade Ally portal is online, ensuring it presents accurate application status updates would keep it relevant to Trade Allies. In addition, limiting future training to half a day would reflect Trade Ally preferences.