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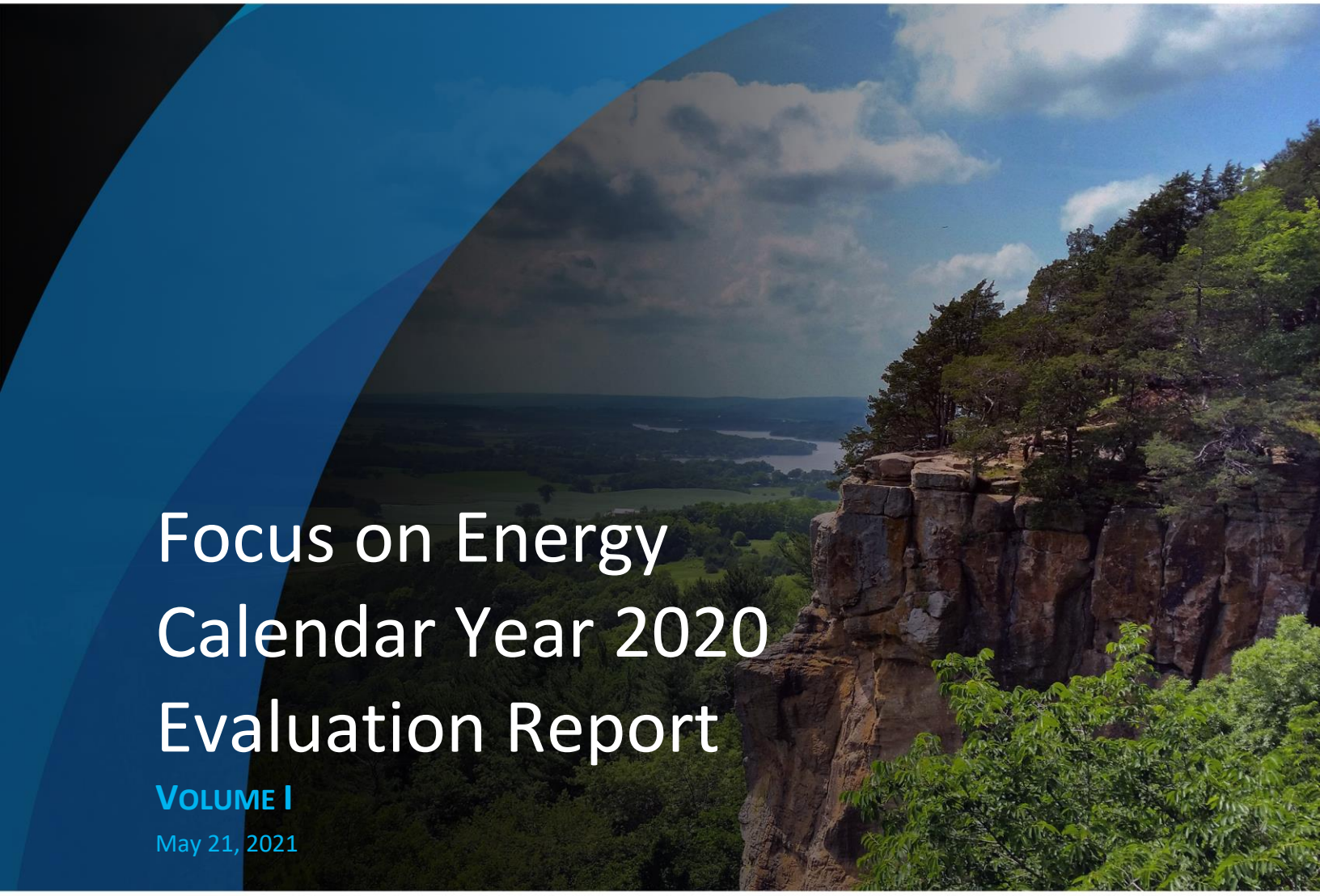

Focus on Energy Calendar Year 2020 Evaluation Report

VOLUME I

May 21, 2021

Prepared for:

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Acronyms and Abbreviations

Acronym	Term
C&I	Commercial and industrial
CY	Calendar year
HVAC	Heating, ventilation, and air conditioning
kW	Kilowatt
kWh	Kilowatt per hour
LED	Light-emitting diode
MMBtu	Million British thermal unit
MMID	Master measure identification
MThm	Thousand therms
MWh	Megawatt per hour
NPS	Net promoter score
NTG	Net-to-gross
PSC	Public Service Commission of Wisconsin
PTAC	Packaged terminal air conditioner
PTHP	Packaged terminal heat pump
RECIP	Renewable Energy Competitive Incentive Program
RIM	Ratepayer impact measure test
SPECTRUM	Statewide Program for Energy Customer Tracking, Resource Utilization, and Data Management
T&D	Transmission and Distribution
TRC	Total resource cost test
TRM	Technical reference manual
UAT	Utility administrator cost test

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Executive Summary

This report, presented in three volumes, describes the evaluation findings and impacts achieved by Focus on Energy for calendar year (CY) 2020 and over the CY 2019 – CY 2022 quadrennium.

- Volume I (this report) is a summary of findings across all solutions, offerings, and measure categories in the portfolio.
- Volume II provides detailed findings for each Focus on Energy solution and offering.
- Volume III provides the appendices with additional details on the evaluation methodologies along with supporting data and evaluation materials.

When appropriate, each volume presents rolled-up quadrennium findings with the annual results. The Wisconsin Focus on Energy Evaluation Dashboard tool allows users to review energy savings by year, customer sector, and measure category.[1]

All four resources (Volume I, Volume II, Volume III, and the Focus on Energy Evaluation Dashboard) should be read together to gain a comprehensive perspective of the Focus on Energy portfolio.

Overall, the CY 2020 offerings achieved high participant satisfaction.

SUMMARY OF METHODS

The evaluation team defined key terms, briefly presented here and described in more detail in the Glossary of Terms in Appendix B (Volume III):

- ***Gross savings.*** Reported change in energy consumption, demand, or both resulting from an efficiency offering
- ***Verified gross savings.*** Energy savings verified by the independent evaluation team[2]
- ***Net savings.*** Savings directly attributable to offering efforts (net of what would have occurred in absence of the offering)

To determine verified gross savings, the evaluation team reviewed and assessed the technical assumptions used by Focus on Energy to calculate savings, participation levels, and measure installation and retention rates. To determine net savings, the evaluation team conducted primary research in CY 2020 and, in a few instances, applied evaluation results from previous years.

[1] *The Wisconsin Focus on Energy Evaluation Dashboard tool is available here:* ***https://focusonenergy.com/evaluation-dashboard***

[2] *The independent evaluation team comprises Cadmus, Apex Analytics, and Nexant.*

Table 1 lists CY 2020 annual gross claimed savings, verified gross savings, and verified net savings for residential and nonresidential offerings.

Table 1. CY 2020 First-Year Annual Savings by Segment

SAVINGS TYPE	UNIT	RESIDENTIAL	NONRESIDENTIAL	MIDSTREAM	TOTAL
Gross	MMBtu	1,272,394	3,451,246	35,303	**4,758,944**
	kWh	275,382,970	456,421,316	654,459	**732,458,745**
	kW	36,488	65,008	211	**101,707**
	therms	3,327,876	18,939,369	330,704	**22,597,949**
Verified Gross	MMBtu	1,268,775	3,421,465	35,381	**4,725,621**
	kWh	272,994,306	457,179,998	656,841	**730,831,145**
	kW	35,738	65,004	211	**100,953**
	therms	3,373,182	18,615,669	331,400	**22,320,251**
Verified Net	MMBtu	592,742	2,585,561	35,381	**3,213,684**
	kWh	99,974,109	349,002,995	656,841	**449,633,945**
	kW	13,874	49,314	211	**63,399**
	therms	2,516,308	13,947,625	331,400	**16,795,333**

Note: Totals may not match the sum of segment savings due to rounding.

Table 2 lists the verified net savings achieved in CY 2019 and CY 2020.

Table 2. CY 2019 and CY 2020 First-Year Annual Verified Net Savings by Segment

CALENDAR YEAR	UNIT	RESIDENTIAL	NONRESIDENTIAL	MIDSTREAM	TOTAL
CY 2019	MMBtu	582,347	2,857,821	N/A	**3,440,169**
	kWh	102,989,753	368,814,108	N/A	**471,803,861**
	kW	13,480	47,828	N/A	**61,307**
	therms	2,309,463	15,994,275	N/A	**18,303,738**
CY 2020	MMBtu	592,742	2,585,561	35,381	**3,213,684**
	kWh	99,974,109	349,002,995	656,841	**449,633,945**
	kW	13,874	49,314	211	**63,399**
	therms	2,516,308	13,947,625	331,400	**16,795,333**
Quad III Totals	**MMBtu**	**1,175,089**	**5,443,382**	**35,381**	**6,653,852**
	kWh	**202,963,862**	**717,817,103**	**656,841**	**921,437,806**
	kW	**27,354**	**97,142**	**211**	**124,707**
	therms	**4,825,771**	**29,941,900**	**331,400**	**35,099,071**

Note: Totals may not match the sum of residential and nonresidential savings due to rounding.

The Public Service Commission of Wisconsin (PSC) ordered the administrator of Focus on Energy to track quadrennium savings achievements with respect to verified gross lifecycle savings targets.[3] Lifecycle savings represent the savings that offerings can realize through measures over their expected useful lives. The PSC set an overall gross lifecycle savings goal for Focus in the 2019-2022 quadrennium in millions of British thermal units (MMBtu). The PSC also established a quadrennium demand savings goal as well as minimum goal thresholds for kWh and therm savings. The minimum goal thresholds were set to achieve a balance in meeting the overall MMBtu goal using both types of savings.

The 2019-2022 quadrennium MMBtu savings goal set by the PSC is 299,555,154 MMBtu. The 2019-2022 quadrennium kW savings goal set by the PSC is 465,617 kW.

This report presents kWh and therms savings achievement relative to the overall goals. Savings in comparison to the minimum fuel-specific goal thresholds will be presented at the end of the quadrennium. The overall quadrennium gross lifecycle savings targets for electric and natural gas presented in this report are 33,824,785,187 kWh and 1,841,449,874 therms, respectively.

Table 3 shows the lifecycle savings achieved by Focus on Energy in CY 2020.

Table 3. CY 2020 Lifecycle Savings by Segment

SAVINGS TYPE	UNIT	RESIDENTIAL	NONRESIDENTIAL	MIDSTREAM	TOTAL
Gross	MMBtu	21,090,255	51,563,420	488,422	**73,142,097**
	kWh	4,500,211,092	6,780,175,714	8,323,255	**11,288,710,061**
	kW	36,488	65,008	211	**101,707**
	therms	57,355,345	284,294,608	4,600,227	**346,250,180**
Verified Gross	MMBtu	21,000,820	49,352,516	489,340	**70,842,676**
	kWh	4,456,602,415	6,866,908,785	8,351,599	**11,331,862,798**
	kW	35,738	65,004	211	**100,953**
	therms	57,948,924	259,226,228	4,608,448	**321,783,600**
Verified Net	MMBtu	9,417,062	37,338,868	489,340	**47,245,270**
	kWh	1,624,115,989	5,232,291,398	8,351,599	**6,864,758,985**
	kW	13,874	49,314	211	**63,399**
	therms	38,755,786	194,862,893	4,608,448	**238,227,128**

[3] *Public Service Commission of Wisconsin. June 6, 2018. Quadrennial Planning Process III – Final Decision. PSC Docket 5-FE-101, PSC REF#: 343909 http://apps.psc.wi.gov/vs2015/ERF_view/viewdoc.aspx?docid=343909*

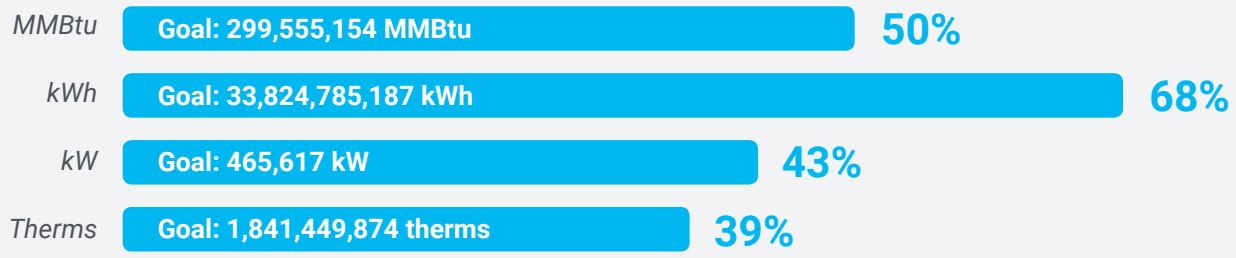
Table 4 lists verified gross lifecycle savings achieved in CY 2019 and CY 2020.

Table 4. CY 2019 and CY 2020 Verified Gross Lifecycle Savings by Segment

CALENDAR YEAR	UNIT	RESIDENTIAL	NONRESIDENTIAL	MIDSTREAM	TOTAL
CY 2019	MMBtu	19,866,612	59,051,663	N/A	**78,918,274**
	kWh	4,120,568,612	7,571,848,059	N/A	**11,692,416,671**
	kW	32,950	67,532	N/A	**100,481**
	therms	58,072,316	332,165,170	N/A	**390,237,486**
CY 2020	MMBtu	21,000,820	49,352,516	489,340	**70,842,676**
	kWh	4,456,602,415	6,866,908,785	8,351,599	**11,331,862,798**
	kW	35,738	65,004	211	**100,953**
	therms	57,948,924	259,226,228	4,608,448	**321,783,600**
Quad III Totals	**MMBtu**	**40,867,432**	**108,404,179**	**489,340**	**149,760,951**
	kWh	**8,577,171,027**	**14,438,756,844**	**8,351,599**	**23,024,279,469**
	kW	**68,688**	**132,536**	**211**	**201,435**
	therms	**116,021,240**	**591,391,398**	**4,608,448**	**712,021,086**

Figure 1 shows the administrator's achievement toward the 2019-2022 quadrennium savings goal. Focus on Energy achieved 50% of the MMBtu savings goal, 68% of the electric energy savings goal, 43% of the electric demand reduction goal, and 39% of the natural gas savings goal.

Figure 1. Administrator's Achievement of Four-Year (CY 2019-CY 2022) Verified Gross Lifecycle Savings Goal



Note: Percentages represent achievement to date (CY 2020) of the administrator's established overall verified gross lifecycle goals.

The administrator also has a contractual goal to maximize participant satisfaction. In CY 2020 surveys, participants gave an average customer satisfaction rating of 9.4 on a 0 to 10 point scale, where 10 meant extremely satisfied and 0 meant extremely dissatisfied. The CY 2020 average customer satisfaction rating was statistically higher, at 9.4,[4] than the portfolio target of 8.9.[5]

The administrator has a goal to ensure that the portfolio passes a benefit/cost analysis, specifically the modified total resource cost test (TRC). Table 5 lists findings from the evaluation team's benefit/cost analysis of the CY 2020 portfolio, including transmission and distribution (T&D) benefits. The residential and nonresidential segments and overall portfolio were cost-effective.

[4] *$p<0.05$ using binomial t-test.*

[5] *The administrator's contract established a portfolio target of 8.9 to maintain or increase customer satisfaction.*

Table 5. CY 2020 Cost-Effectiveness Results

FOCUS ON ENERGY BENEFITS AND COSTS		PORTFOLIO BREAKOUT	CORE EFFICIENCY	RURAL	RENEWABLES
Incentives	$55,469,515		$47,677,244	$3,171,874	$4,620,397
Modified TRC Benefits	$691,541,465		$597,095,217	$40,036,111	$54,410,137
Modified TRC Costs	$284,353,558		$231,190,174	$9,450,821	$43,712,564
Portfolio TRC Ratio with T&D Benefits	**2.43**	Alone	**2.58**	**4.24**	**1.24**
		With Core		**2.65**	**2.37**
		With Core & Rural			**2.43**
		With Core & Rural & Renewables			**2.43**

Introduction

Focus on Energy, Wisconsin's statewide energy efficiency and renewable resource program, is funded by the state's investor-owned energy utilities—as required under Wisconsin Statute §196.374(2)(a)—and by participating municipal and electric cooperative utilities. The Public Service Commission of Wisconsin (PSC) provides oversight of Focus on Energy.

Focus on Energy works with eligible Wisconsin residents and businesses to install cost-effective energy efficiency and renewable energy projects. Information, resources, and financial incentives enable consumers to implement and complete energy projects they otherwise would not have been able to complete or to complete projects ahead of schedule. Focus on Energy helps Wisconsin residents and businesses manage rising energy costs, promotes in-state economic development, protects the environment, and helps manage Wisconsin's demand for electricity and natural gas.

The state's investor-owned utilities, with PSC approval, contracted with APTIM to serve as the administrator for the CY 2019 - CY 2022 quadrennium. The administrator, in collaboration with the implementers, is responsible for designing all Focus on Energy solutions and for the overall performance of these solutions to meet Wisconsin's energy-savings goals. The administrator is also responsible for managing and coordinating individual offerings, supporting customers and trade allies through a customer service center, coordinating with participating utilities, guiding marketing and communication activities, and reporting to the PSC and to the Statewide Energy Efficiency and Renewable Administration.

The Statewide Energy Efficiency and Renewable Administration, formed by the state's investor-owned utilities, is responsible for collecting utility funding for Focus on Energy and for contracting with the administrator.

In CY 2020, Focus on Energy maintained three separate channels:

- The **residential channel**, servicing single-family and multifamily homes
- The **nonresidential channel**, servicing commercial, industrial, school, government, and agribusiness customers
- The **midstream channel**, servicing residential and nonresidential customers via distributors

CY 2020 Evaluation

The evaluation team investigated the performance of seven solutions and 20 offerings that delivered energy savings during CY 2020. Table 6 lists the solutions and offerings evaluated in the residential and nonresidential sector.

Table 6. Residential and Nonresidential Solutions and Offerings

Sector	Solution	Offering
Residential	Direct to Customer	Appliance Recycling Farmhouse Kits Online Marketplace Packs Retail Rural Retail Events
	Trade Ally	Heating and Cooling Insulation and Air Sealing Renewable Energy, Residential
	New Construction	Residential New Construction
Residential and Nonresidential	Midstream	Midstream
Nonresidential	Business and Industry	Agribusiness Commercial and Industrial Large Industrial
	Schools and Government	Schools Government
	New Construction	Design Assistance/Review Prescriptive
	Trade Ally	Renewable Energy
	Renewable Energy Competitive Incentive Program	RECIP

Summary of Measures by Segment

The evaluation team assessed the electric and natural gas savings achieved by each measure installed in CY 2020 during its first year of operation, as well as any impacts incurred by each measure during its effective useful life. Reporting on both first-year annual and lifecycle savings provides a full picture of each solution's performance.

Table 7 lists all measure categories in the residential, nonresidential, and midstream channels.

Table 7. CY 2020 Residential, Nonresidential and Midstream Measure Categories

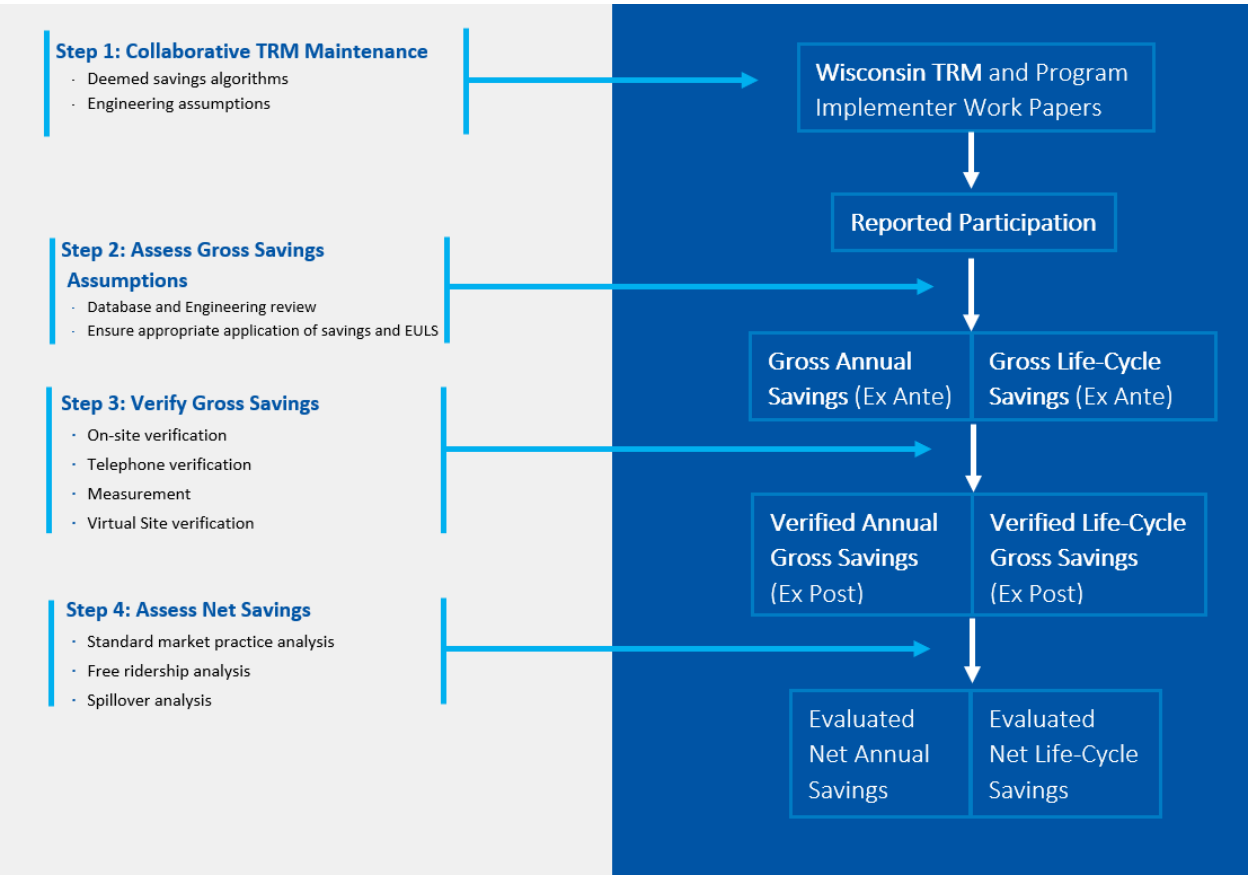
Measure Categories	
Residential Only	
Domestic Hot Water – Insulation Domestic Hot Water – Showerhead HVAC – Air Conditioner – Residential HVAC – Tune-up/Repair/Commissioning	Motors & Drives – Motor Renewable Energy – Geothermal Vending & Plug Loads - Controls
Residential and Nonresidential	
Boilers & Burners – Boiler Boilers & Burners – Controls Boilers & Burners – Tune-Up/Repair/Commissioning Building Shell – Air Sealing Building Shell – Insulation	HVAC – Controls HVAC – Furnace HVAC – Packaged Terminal Unit (PTAC, PTHP) HVAC – Rooftop Unit/Split System AC

Measure Categories	
Building Shell – Window	Lighting – Light Emitting Diode (LED)
Domestic Hot Water – Aeration	New Construction – Whole Building
Domestic Hot Water – Other	Other – Bonus
Domestic Hot Water – Water Heater	Other – Other
	Refrigeration – Other
	Renewable Energy - Photovoltaics
Nonresidential Only	
Agriculture - Bonus	HVAC - Steam Trap
Agriculture - Dryer	HVAC - Unit Heater
Agriculture - Fan	HVAC - Variable Air Volume (VAV)
Agriculture - Grain Dryer	Industrial Ovens and Furnaces - Other
Agriculture - Greenhouse	Information Technology - Other
Agriculture - Heat Exchanger	Information Technology - Servers
Agriculture - Livestock Waterer	Information Technology - Supporting Equipment
Agriculture - Tune-up/Repair/Commissioning	Laundry - Clothes Washer
Agriculture - Variable Speed Drive	Lighting - Controls
Agriculture - Water Heater	Lighting - Delamping
Boilers & Burners - Energy Recovery	Lighting - Other
Boilers & Burners - Insulation	Lighting - Reconfigure Equipment
Boilers & Burners - Variable Speed Drive	Motors & Drives - Other
Building Shell - Other	Motors & Drives - Variable Speed Drive
Compressed Air, Vacuum Pumps - Compressor	New Construction - Design
Compressed Air, Vacuum Pumps - Controls	Pools - Variable Speed Drive
Compressed Air, Vacuum Pumps - Dryer	Process - Energy Recovery
Compressed Air, Vacuum Pumps - Energy Recovery	Process - Filtration
Compressed Air, Vacuum Pumps - Filtration	Process - Other
Compressed Air, Vacuum Pumps - Nozzle	Process - Pump
Compressed Air, Vacuum Pumps - Other	Process - Specialty Pulp & Paper
Compressed Air, Vacuum Pumps - Reconfigure Equipment	Process - Variable Speed Drive
Compressed Air, Vacuum Pumps - System Isolation	Refrigeration - Controls
Compressed Air, Vacuum Pumps - Tune-up/Repair/Commissioning	Refrigeration - Energy Recovery
	Refrigeration - Heat Exchanger
Domestic Hot Water - Energy Recovery	Refrigeration - Motor
Domestic Hot Water - Variable Speed Drive	Refrigeration - Reconfigure Equipment
Food Service - Controls	Refrigeration - Refrigerated Case Door
Food Service - Griddle	Refrigeration - Strip Curtain
HVAC - Chiller	Refrigeration - Tune-up/Repair/Commissioning
HVAC - Economizer	Renewable Energy - Biogas
HVAC - Energy Recovery	Training & Special - Other
HVAC - Fan	Waste Water Treatment - Aeration
HVAC - Filtration	Waste Water Treatment - Other
HVAC - Infrared Heater	Waste Water Treatment - Study
HVAC - Motor	
HVAC - Scheduling	
Nonresidential and Midstream	
Food Service - Dishwasher, Commercial	Food Service - Steamer
Food Service - Fryer	HVAC - Variable Speed Drive
Food Service - Oven	Refrigeration - Ice Machine
Food Service - Refrigerator/Freezer - Commercial	
Midstream Only	
Food Service - Hot Holding Cabinet	
Residential, Nonresidential, and Midstream	
HVAC – Other	

Overview of Evaluation Activities

Figure 2 depicts the four-step process the evaluation team conducted in CY 2020 (further explained after the figure).

Figure 2. Evaluation Steps to Determine CY 2020 Net Savings



Step 1: Collaborative TRM Maintenance. The evaluation team collaborated with the PSC and key Focus on Energy stakeholders to ensure that the solutions' deemed savings, algorithms, and input assumptions are appropriate. Specific activities in this step included developing measure-specific workpapers, preparing deemed savings reports, and updating the Wisconsin Focus on Energy Technical Reference Manual (TRM).

Step 2: Assess Gross Savings Assumptions. The evaluation team reviewed the implementation database to check for entry errors, inconsistencies, ineligible equipment, and any other possible errors. The evaluation team reconciled this information with data from the administrator and the implementers. This process produced the *ex ante* gross annual and lifecycle savings.

Step 3: Verify Gross Savings. The evaluation team verified the installation of measures—either through site visits or phone surveys—and assessed gross savings, which included revisiting baseline assumptions and engineering inputs. The evaluation team also recalculated or measured the actual performance of installed measures, particularly for hybrid and custom projects. The evaluation team applied the data

collection and analysis methods appropriate for the specific solutions, offerings, and installed measures. This process produced the *ex post* gross annual and lifecycle savings.

Step 4: Assess Net Savings. The evaluation team estimated net-to-gross (NTG) ratios that represent the proportion of gross savings directly attributable to the influence of the solutions. In deriving these ratios, the evaluation team accounted for—and deducted—reported savings that were associated with *freeriders* (participants who would have undertaken the same action and achieved the same savings in absence of an offering) and also accounted for—and added—*spillover* (savings that were the result of an offering's influence, but for which no incentive was paid and for which no solution had recorded savings).

The evaluation team applied NTG ratios to the *ex post* gross savings from Step 3, determining net savings based on self-reported information (conducted via surveys) or using a standard market practice approach. For the standard market practice method, the evaluation team used data collected through the evaluation process to define the average market baseline and average offering-installed energy consumption of specific measure categories.

Table 8 lists the specific data collection activities and sample sizes used in the residential and nonresidential segments for the CY 2020 evaluation.

Table 8. CY 2020 Evaluation Activities

Evaluation Activity	Residential	Nonresidential	Total CY 2020
On-Site, and Virtual Site Visits Evaluation, Measurement, and Verification [a]	0	68	**68**
Engineering Desk Reviews and Interviews	0	348	**348**
Participant and Nonparticipant Surveys and Interviews	3,008	358	**3,366**
Ongoing Participant Satisfaction Surveys [b]	5,619	1,083	**6,702**
Program Actor Interviews	8	6	**14**
Trade Ally and Market Actor Surveys/Interviews [c]	0	11	**11**
Regression Modeling/Billing Analyses	2	4	**6**
Sales Data Analyses	2	0	**2**
System Energy Monitoring Data Collection	0	9	**9**

[a] All projects included in the on-site evaluation, measurement, and verification also received an engineering desk review.

[b] This row includes only the 43% sample from all Trade Ally Solutions ongoing participant satisfaction survey responses, the 33% sample from all Online Marketplace offering ongoing participant satisfaction survey responses, and the 7% sample from all Packs offering ongoing participant satisfaction survey responses that were analyzed for the CY 2020 evaluation.

[C] Excludes trade ally surveys conducted by the administrator or implementers

Evaluation Findings

Table 9 lists the overall net lifecycle MMBtu, electricity, demand, and natural gas savings for Focus on Energy's portfolio in CY 2019 and CY 2020.

Table 9. Overall Portfolio Net Lifecycle Savings by Calendar Year

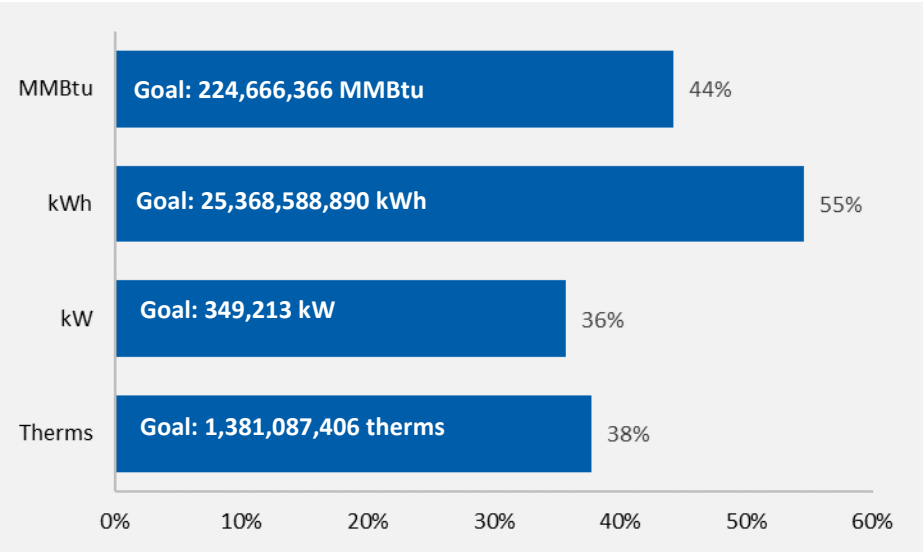
Calendar Year	Energy Savings (MMBtu)	Electric Savings (kWh)	Demand Reduction (kW)	Natural Gas Savings (therms)
CY 2019	52,150,133	6,988,011,090	61,307	283,070,389
CY 2020	47,245,270	6,864,758,985	63,399	238,227,128
Quad III Total	**99,395,403**	**13,852,770,075**	**124,706**	**521,297,517**

The PSC Final Decision for Quadrennial Planning Process III (PSC Ref#: 343909) sets four-year net lifecycle savings goals for the PSC of 224,666,366 MMBtu, 25,368,588,890 kWh, 349,213 kW, and 1,381,087,406 therms. The portfolio is required to meet only 90% of the electric energy savings and natural gas savings goals over the full quadrennium. Remaining MMBtu savings above the 90% threshold can be met with either fuel. These minimum thresholds were established to provide flexibility in offering delivery in the changing markets.

This report presents kWh and therms savings achievement relative to the overall goals. Savings in comparison to the minimum goal thresholds will be presented at the end of the quadrennium.

The Focus on Energy offerings reached 44% of the MMBtu savings goal, 55% of the electric energy savings goal, 36% of the electric demand reduction goal, and 38% of the natural gas quadrennium savings goal to date. Figure 3 shows a comparison of Focus on Energy's actual quadrennium savings to the PSC's established goals and verified gross targets for the full four-year quadrennium.

Figure 3. Focus on Energy's Achievement of Four-Year (CY 2019 - CY 2022) Net Lifecycle Savings Goal



Note: Percentages represent achievement to date (CY 2020) of PSC's established overall net lifecycle goals for the quadrennium.

Table 10 lists the overall verified gross lifecycle electricity savings, demand reduction, and natural gas savings for the portfolio in CY 2019 and CY 2020.

Table 10. Overall Portfolio Verified Gross Lifecycle Savings for CY 2019 and CY 2020

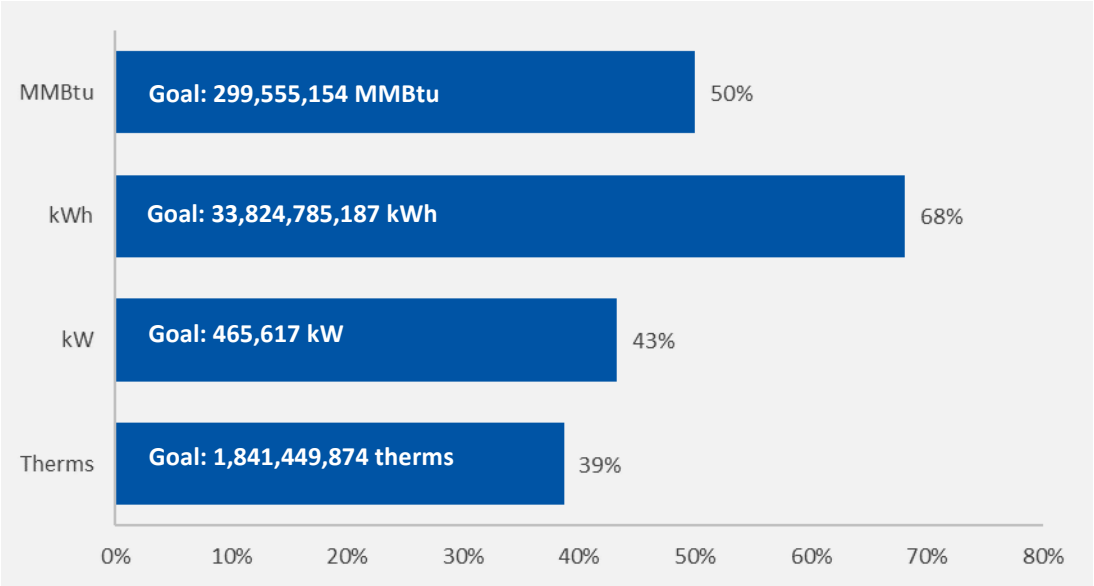
Calendar Year	Energy Savings (MMBtu)	Electric Savings (kWh)	Demand Reduction (kW)	Natural Gas Savings (therms)
CY 2019	78,918,274	11,692,416,671	100,481	390,237,486
CY 2020	70,842,676	11,331,862,798	100,953	321,783,600
Quad III Total	**149,760,950**	**23,024,279,469**	**201,434**	**712,021,086**

The PSC has ordered that the Focus on Energy administrator track quadrennium savings goals compared to verified gross lifecycle savings targets: 299,555,154 MMBtu, 33,824,785,187 kWh, 465,617 kW, and 1,841,449,874 therms (PSC Ref#: 343909). Similar to the discussion above regarding verified net lifecycle savings goals, this report presents kWh and therms savings achievement relative to the overall goals rather than the 90% threshold goals. Savings in comparison to the minimum goal thresholds will be presented at the end of the quadrennium.

Of the quadrennium goals, the administrator reached 50% of the MMBtu savings goal, 68% of the electric energy savings goal, 43% of the demand reduction goal, and 39% of the natural gas savings goal.

Figure 4 shows a comparison of the actual quadrennium savings totals to the administrator's quadrennium savings goals.

Figure 4. Focus on Energy Administrator's Achievement of Four-Year (CY 2019 - CY 2022) Verified Gross Lifecycle Savings Goal



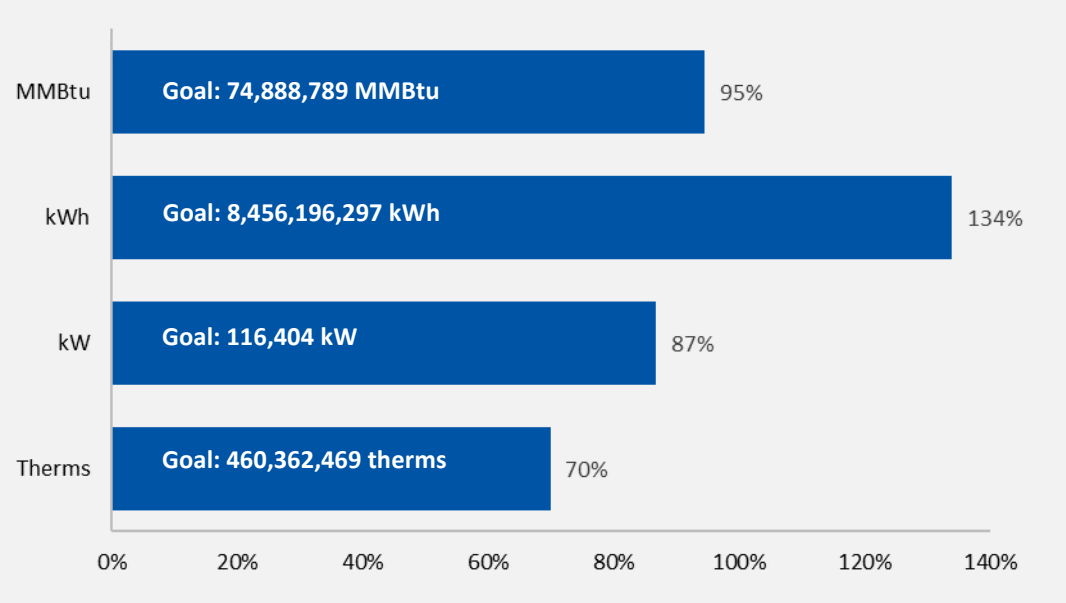
Note: Percentages represent achievements to date (CY 2020) of the administrator's established overall verified gross lifecycle goals for the quadrennium.

The administrator also tracks interim annual verified gross lifecycle targets, defined as approximately one-fourth of the overall CY 2019 - CY 2022 quadrennium savings goals. In CY 2020, these targets represented 74,888,789 MMBtu, 8,456,196,297 kWh, 116,404 kW, and 460,362,469 therms.

The administrator reached 95% of the MMBtu savings target, 134% of the electric energy savings target, 87% of the electric demand reduction target, and 70% of the natural gas verified gross lifecycle savings target.

Figure 5 shows the CY 2020 actual savings totals compared to the administrator's CY 2020 savings targets.

Figure 5. Focus on Energy Administrator's Achievement of CY 2020 Verified Gross Lifecycle Savings Targets



Note: Percentages represent achievements to date of the administrator's verified gross lifecycle goals for CY 2020.

Summary of Impacts by Offering

This section summarizes the CY 2020 savings and participation for each offering in the Focus on Energy portfolio. Volume II discusses savings for each offering and the approaches used for calculating the savings. The evaluation team varied the calculation approach and activities by offering depending on the level of participation, savings achieved, and information available.

Across all offerings, the evaluation team applied equations for verified gross lifecycle, net annual, and net lifecycle savings:

$$Verified\ Gross\ Lifecycle\ Savings\ = \sum(Verified\ Gross\ Annual\ Savings \times EUL\ for\ each\ measure)$$

$$Verified\ Net\ Annual\ Savings = \sum(Verified\ Gross\ Annual\ Savings\ \times NTG\ for\ each\ measure)$$

$$Verified\ Net\ Lifecycle\ Savings = \sum(Verified\ Gross\ Lifecycle\ Savings \times NTG\ for\ each\ measure)$$

Table 11 lists the total CY 2020 participation (measured as number of participating customers) in each offering and segment.

Table 11. Total Participation by Offering in CY 2020

Channel	Offering	CY 2020 Participation
Residential	Appliance Recycling	4,667
	Farmhouse Kits	603
	Heating and Cooling	26,286
	Insulation and Air Sealing	1,645
	Online Marketplace	32,594
	Packs	106,482
	Renewable Energy, Residential	1,946
	Residential New Construction	2,259
	Retail [a]	968,007
	Rural Retail Events	2,722
Residential Subtotal		**1,147,211**
Midstream	Midstream	740
Midstream Subtotal		**740**
Nonresidential	Agriculture	915
	Commercial and Industrial	2,810
	Design Assistance/Review	110
	Government	228
	Large Industrial	249
	Prescriptive	202
	RECIP	19
	Schools	321
	Renewable Energy, Commercial	145
Nonresidential Subtotal		**4,999**
Total		**1,152,950**

[a] Of the CY 2020 Retail offering participants, 10,396 were not upstream lighting participants.

Figure 6 shows verified gross lifecycle savings by channel.

Figure 6. CY 2020 Verified Gross Lifecycle Savings Impacts by Channel

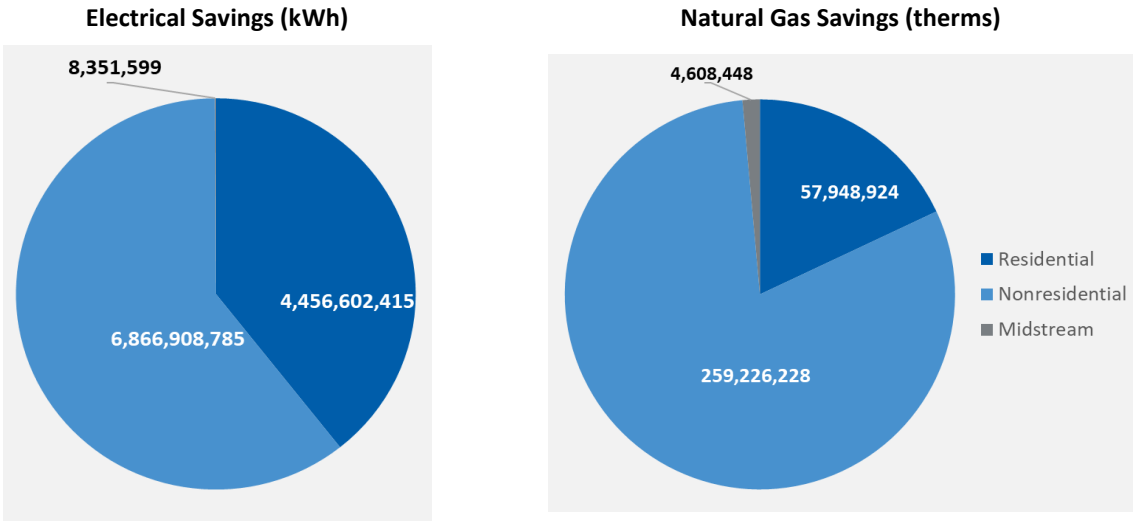
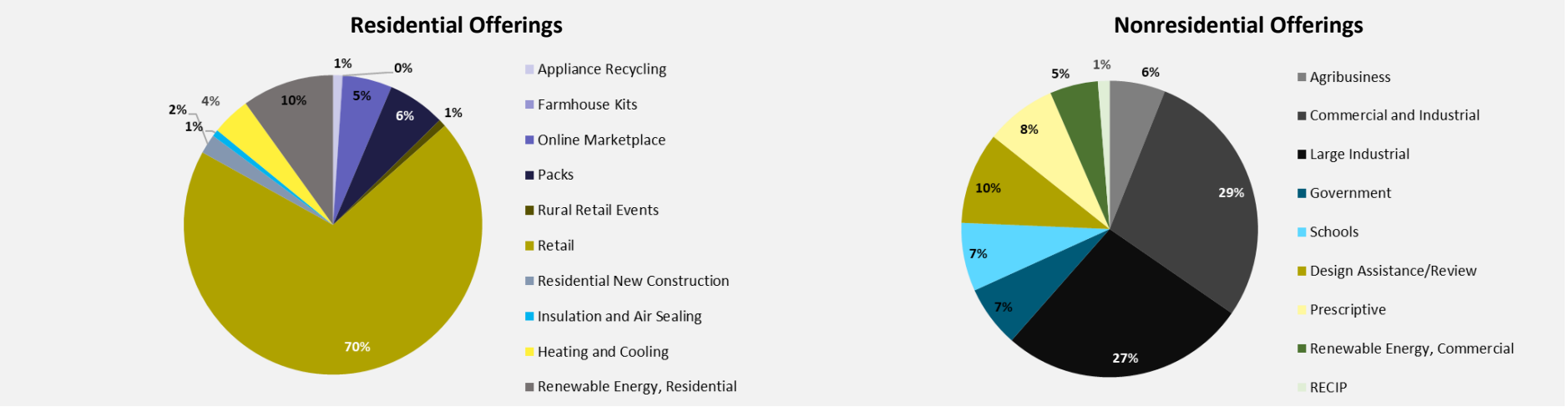


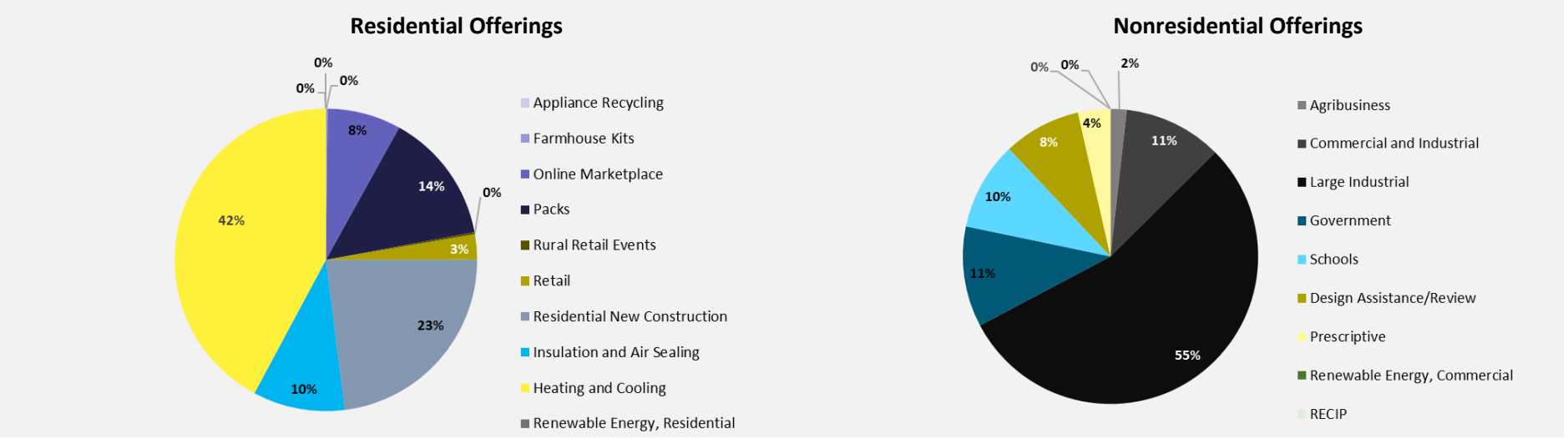
Figure 7 and Figure 8 show the verified gross lifecycle electric and natural gas energy savings by offering for three channels.

Figure 7. CY 2020 Verified Gross Lifecycle Electric Energy Impacts by Offerings



Note: Savings for Midstream are not shown as there is only the one offering.

Figure 8. CY 2020 Verified Gross Lifecycle Natural Gas Energy Impacts by Offerings



Note: Savings for Midstream are not shown as there is only the one offering.

Table 12 lists the first-year annual gross savings, verified gross savings, and verified net demand reduction for electricity and natural gas by offering, segment, and overall portfolio.

Table 12. Summary of CY 2020 Annual Savings by Offering

Solution Name	Offering Name	Gross			Verified Gross			Verified Net		
		kWh	kW	therms	kWh	kW	therms	kWh	kW	therms
Residential										
Direct to Customer	Appliance Recycling	4,112,206	480	0	4,431,570	517	0	1,997,134	233	0
	Farmhouse Kits	197,855	18	9,457	203,111	18	9,794	165,868	15	9,479
	Online Marketplace	19,243,652	1,762	412,349	16,795,694	1,173	456,192	14,395,507	998	397,192
	Packs	19,603,098	1,906	643,172	20,112,988	1,953	650,130	17,098,096	1,674	622,030
	Retail	196,540,555	22,766	171,251	195,339,470	22,381	153,642	42,784,681	4,709	101,319
	Rural Retail Events	2,809,232	314	21,647	2,380,663	207	12,117	1,997,626	174	11,639
Trade Ally	Heating and Cooling	10,416,028	1,970	1,340,213	11,272,511	1,979	1,362,032	8,945,121	1,621	1,100,902
	Insulation and Air Sealing	1,599,150	574	285,154	1,597,105	574	284,642	1,942,382	745	251,516
	Renewable Energy, Residential	17,746,157	5,939	0	17,746,157	6,177	0	10,647,694	3,706	0
New Construction	Residential New Construction	3,115,038	759	444,633	3,115,038	759	444,633	0	0	22,232
Residential Total		**275,382,970**	**36,488**	**3,327,876**	**272,994,306**	**35,738**	**3,373,182**	**99,974,109**	**13,874**	**2,516,308**
Midstream										
Midstream	Midstream	654,459	211	330,704	656,841	211	331,400	656,841	211	331,400
Midstream Total		**654,459**	**211**	**330,704**	**656,841**	**211**	**331,400**	**656,841**	**211**	**331,400**
Nonresidential										
Business and Industry	Agribusiness	27,845,261	3,746	288,793	27,288,356	3,746	259,914	23,467,986	3,222	223,526
	Commercial and Industrial	149,925,381	20,235	1,945,652	148,426,127	20,033	1,926,196	114,288,118	15,425	1,483,171
	Large Industrial	119,196,563	13,082	11,983,350	121,580,494	13,474	11,384,182	89,969,566	9,971	8,424,295
Schools and Government	Government	31,882,520	3,814	1,290,087	32,201,346	3,852	1,625,509	23,506,982	2,812	1,186,622
	Schools	38,554,177	7,136	1,751,011	38,554,177	7,136	1,751,011	28,144,549	5,209	1,278,238
New Construction	Design Assistance/Review	34,412,314	6,429	1,099,494	34,412,314	6,301	1,099,494	27,873,974	5,104	890,590
	Prescriptive	36,436,136	4,860	580,983	36,436,136	4,812	569,363	29,513,270	3,897	461,184
Trade Ally	Renewable Energy, Commercial	14,432,806	4,793	0	14,432,806	4,793	0	8,659,683	2,876	0
RECIP	RECIP	3,736,159	913	0	3,848,244	858	0	3,578,867	798	0
Nonresidential Total		**456,421,316**	**65,008**	**18,939,369**	**457,179,998**	**65,004**	**18,615,669**	**349,002,995**	**49,314**	**13,947,625**
Total All Offerings		**732,458,745**	**101,707**	**22,597,949**	**730,831,145**	**100,953**	**22,320,251**	**449,633,945**	**63,399**	**16,795,333**

Summary of Impacts by Measure Category

Table 13 lists CY 2020 residential energy savings, demand reduction, and incentive costs by measure category.

Table 13. Summary of CY 2020 Annual Savings by Measure Category in the Residential Channel

Measure Category	Verified Gross						Incentives Dollars	Incentive Dollars Percentage
	kWh	kWh Percentage	kW	kW Percentage	Therms	Therms Percentage		
Boilers & Burners-Boiler	0	0.00%	0	0.00%	158,874	4.71%	$301,575.00	1.30%
Boilers & Burners-Controls	14,625	0.01%	0	0.00%	1,980	0.06%	$3,975.00	0.02%
Boilers & Burners-Tune-up/Repair/Commissioning	0	0.00%	0	0.00%	111	0.00%	$329.12	0.00%
Building Shell-Air Sealing	98,667	0.04%	7	0.02%	6,980	0.21%	$995,201.43	4.30%
Building Shell-Insulation	1,563,964	0.57%	596	1.67%	291,152	8.63%	$1,023,733.90	4.42%
Building Shell-Window	752	0.00%	1	0.00%	433	0.01%	$3,131.75	0.01%
Domestic Hot Water-Aeration	1,390,712	0.51%	93	0.26%	273,535	8.11%	$170,853.49	0.74%
Domestic Hot Water-Insulation	2,304,831	0.84%	356	1.00%	276,700	8.20%	$252,156.54	1.09%
Domestic Hot Water-Other	130,928	0.05%	17	0.05%	53,759	1.59%	$83,717.25	0.36%
Domestic Hot Water-Showerhead	1,416,453	0.52%	68	0.19%	283,345	8.40%	$269,676.20	1.16%
Domestic Hot Water-Water Heater	0	0.00%	0	0.00%	17,768	0.53%	$21,050.00	0.09%
HVAC-Air Conditioner - Residential	2,443	0.00%	5	0.01%	0	0.00%	$3,677.86	0.02%
HVAC-Controls	9,916,199	3.63%	0	0.00%	661,348	19.61%	$1,354,551.00	5.85%
HVAC-Furnace	5,092,113	1.87%	640	1.79%	864,671	25.63%	$2,912,975.00	12.58%
HVAC-Other	817,394	0.30%	271	0.76%	36,593	1.08%	$271,200.00	1.17%
HVAC-Packaged Terminal Unit (PTAC, PTHP)	25,766	0.01%	3	0.01%	0	0.00%	$1,200.00	0.01%
HVAC-Rooftop Unit/Split System AC	726,789	0.27%	922	2.58%	0	0.00%	$168,175.00	0.73%
HVAC-Tune-up/Repair/Commissioning	0	0.00%	0	0.00%	1,302	0.04%	$10,970.15	0.05%
Lighting-Light Emitting Diode (LED)	221,337,443	81.08%	24,890	69.65%	0	0.00%	$10,623,421.81	45.89%
Motors & Drives-Motor	27,390	0.01%	5	0.01%	0	0.00%	$4,590.00	0.02%
New Construction-Whole Building	3,115,038	1.14%	759	2.12%	444,633	13.18%	$1,256,900.00	5.43%
Other-Bonus	0	0.00%	0	0.00%	0	0.00%	$3,875.04	0.02%
Other-Other	0	0.00%	0	0.00%	0	0.00%	$9,425.15	0.04%
Refrigeration-Other	4,431,570	1.62%	517	1.45%	0	0.00%	$5,940.00	0.03%
Renewable Energy-Geothermal	515,302	0.19%	104	0.29%	0	0.00%	$72,250.00	0.31%
Renewable Energy-Photovoltaics	17,746,157	6.50%	6,177	17.28%	0	0.00%	$2,837,744.29	12.26%
Vending & Plug Loads-Controls	2,319,773	0.85%	307	0.86%	0	0.00%	$486,785.15	2.10%

Note: This table does not include adjustment measure records. As a result, this sum will not match with other CY 2020 totals.

Table 14 lists CY 2020 nonresidential savings and incentive costs by measure category.

Table 14. Summary of CY 2020 Annual Savings by Measure Category in the Nonresidential Channel

Measure Category	Verified Gross						Incentive Dollars	Incentive Dollars Percentage
	kWh	kWh Percentage	kW	kW Percentage	therms	Therms Percentage		
Aeration	4,469,258	0.98%	499	0.77%	31,480	0.17%	$203,401.93	0.64%
Air Sealing	0	0.00%	0	0.00%	164,085	0.88%	$26,600.00	0.08%
Biogas	1,957,000	0.43%	188	0.29%	0	0.00%	$117,169.25	0.37%
Boiler	-21,493	0.00%	-3	0.00%	1,713,244	9.20%	$1,356,686.30	4.24%
Bonus	0	0.00%	0	0.00%	0	0.00%	$272,164.84	0.85%
Chiller	5,477,293	1.20%	877	1.35%	0	0.00%	$475,582.31	1.49%
Clothes Washer	22,370	0.00%	-5	-0.01%	33,821	0.18%	$34,558.84	0.11%
Compressor	7,064,310	1.55%	1,294	1.99%	0	0.00%	$329,570.00	1.03%
Controls	26,571,747	5.81%	2,004	3.08%	1,221,143	6.56%	$1,612,654.03	5.04%
Delamping	1,098,668	0.24%	228	0.35%	0	0.00%	$23,685.00	0.07%
Design	34,206,383	7.48%	6,282	9.66%	1,093,326	5.87%	$3,975,550.89	12.42%
Dishwasher, Commercial	28,164	0.01%	0	0.00%	2,264	0.01%	$2,250.00	0.01%
Dryer	538,647	0.12%	81	0.13%	134,312	0.72%	$244,287.50	0.76%
Economizer	4,537	0.00%	0	0.00%	0	0.00%	$400.00	0.00%
Energy Recovery	-10,664,671	-2.33%	-1,358	-2.09%	6,626,556	35.60%	$1,451,372.34	4.53%
Fan	1,405,093	0.31%	349	0.54%	23,469	0.13%	$130,571.39	0.41%
Filtration	315,323	0.07%	53	0.08%	279,970	1.50%	$210,480.24	0.66%
Fryer	28,482	0.01%	6	0.01%	123,844	0.67%	$51,430.00	0.16%
Furnace	62,924	0.01%	13	0.02%	85,169	0.46%	$70,080.00	0.22%
Grain Dryer	0	0.00%	0	0.00%	59,870	0.32%	$48,380.00	0.15%
Greenhouse	0	0.00%	0	0.00%	381	0.00%	$825.12	0.00%
Griddle	3,445	0.00%	1	0.00%	0	0.00%	$150.00	0.00%
Heat Exchanger	1,200,142	0.26%	2	0.00%	0	0.00%	$72,153.87	0.23%
Ice Machine	7,458	0.00%	1	0.00%	0	0.00%	$325.00	0.00%
Infrared Heater	0	0.00%	0	0.00%	12,635	0.07%	$13,077.50	0.04%
Insulation	12,685	0.00%	17	0.03%	290,926	1.56%	$218,769.89	0.68%
Light Emitting Diode (LED)	239,109,602	52.30%	32,943	50.68%	0	0.00%	$11,910,074.47	37.20%
Livestock Waterer	383,270	0.08%	0	0.00%	0	0.00%	$11,823.04	0.04%
Motor	1,146,960	0.25%	140	0.22%	0	0.00%	$35,150.00	0.11%

Measure Category	Verified Gross						Incentive Dollars	Incentive Dollars Percentage
	kWh	kWh Percentage	kW	kW Percentage	therms	Therms Percentage		
Nozzle	19,008	0.00%	7	0.01%	0	0.00%	$32.00	0.00%
Other	48,172,035	10.54%	5,196	7.99%	5,525,320	29.68%	$4,545,759.62	14.20%
Oven	4,124	0.00%	1	0.00%	2,636	0.01%	$3,040.00	0.01%
Packaged Terminal Unit (PTAC, PTHP)	953,369	0.21%	38	0.06%	0	0.00%	$32,605.00	0.10%
Photovoltaics	16,324,049	3.57%	5,463	8.40%	0	0.00%	$1,771,831.65	5.53%
Pump	808,043	0.18%	82	0.13%	0	0.00%	$34,587.19	0.11%
Reconfigure Equipment	1,882,740	0.41%	350	0.54%	0	0.00%	$94,011.91	0.29%
Refrigerated Case Door	2,189,834	0.48%	198	0.30%	107,580	0.58%	$86,284.00	0.27%
Refrigerator/Freezer - Commercial	31,237	0.01%	4	0.01%	0	0.00%	$6,800.00	0.02%
Rooftop Unit/Split System AC	1,278,979	0.28%	1,314	2.02%	123,645	0.66%	$369,430.33	1.15%
Scheduling	406,268	0.09%	11	0.02%	14,304	0.08%	$21,538.40	0.07%
Servers	646,286	0.14%	74	0.11%	0	0.00%	$32,574.56	0.10%
Specialty Pulp & Paper	2,238,866	0.49%	433	0.67%	0	0.00%	$125,662.50	0.39%
Steam Trap	0	0.00%	0	0.00%	505,248	2.71%	$59,070.00	0.18%
Steamer	9,978	0.00%	26	0.04%	2,735	0.01%	$2,640.00	0.01%
Strip Curtain	6,237	0.00%	1	0.00%	0	0.00%	$140.00	0.00%
Study	0	0.00%	0	0.00%	0	0.00%	$34,950.00	0.11%
Supporting Equipment	768,214	0.17%	85	0.13%	0	0.00%	$27,364.52	0.09%
System Isolation	117,945	0.03%	17	0.03%	0	0.00%	$2,312.64	0.01%
Tune-up/Repair/Commissioning	7,554,115	1.65%	0	0.00%	263,756	1.42%	$120,066.55	0.37%
Unit Heater	0	0.00%	0	0.00%	19,552	0.11%	$13,283.38	0.04%
Variable Air Volume (VAV)	910,925	0.20%	116	0.18%	78,719	0.42%	$113,270.16	0.35%
Variable Speed Drive	58,217,998	12.73%	7,958	12.24%	0	0.00%	$1,491,201.15	4.66%
Water Heater	6,220	0.00%	0	0.00%	46,627	0.25%	$61,902.60	0.19%
Whole Building	205,931	0.05%	19	0.03%	6,168	0.03%	$49,167.00	0.15%
Window	0	0.00%	0	0.00%	22,883	0.12%	$20,340.00	0.06%

Note: This table does not include adjustment measure records. As a result, this sum will not match with other CY 2020 totals.

Table 15 lists CY 2020 midstream savings and incentive costs by measure category.

Table 15. Summary of CY 2020 Annual Savings by Measure Category in the Midstream Channel

Measure Category	Verified Gross						Incentive Dollars	Incentive Dollars Percentage
	kWh	kWh Percentage	kW	kW Percentage	therms	Therms Percentage		
Dishwasher, Commercial	303,237	46.17%	15	6.99%	1,561	0.47%	$12,200.00	3.01%
Fryer	0	0.00%	0	0.00%	208,199	62.82%	$114,900.00	28.39%
Hot Holding Cabinet	49,407	7.52%	10	4.52%	0	0.00%	$4,500.00	1.11%
HVAC-Other	177,986	27.10%	50	23.66%	105,795	31.92%	$234,000.00	57.82%
Ice Machine	31,177	4.75%	4	1.68%	0	0.00%	$1,250.00	0.31%
Oven	5,168	0.79%	1	0.65%	12,941	3.90%	$9,450.00	2.33%
Refrigerator/Freezer - Commercial	16,503	2.51%	2	0.89%	0	0.00%	$5,700.00	1.41%
Steamer	49,890	7.60%	130	61.61%	2,904	0.88%	$15,300.00	3.78%
Variable Speed Drive	23,473	3.57%	0	0.00%	0	0.00%	$7,425.00	1.83%

Note: This table does not include adjustment measure records. As a result, this sum will not match with other CY 2020 totals.

Residential Segment Process Evaluation Findings

For the CY 2020 process evaluation of residential offerings, the evaluation team collected information and perspectives from Focus on Energy participants, the administrator, and the implementers. The team reached participants through offering-level phone or online surveys, an online or mailed participant satisfaction survey, or both. Table 16 shows the evaluation activity by residential offering.

Table 16. CY 2020 Residential Process Evaluation Activities by Solution and Offering

Solution	Offering	Participant Surveys	Ongoing Participant Satisfaction Surveys	Program Actor Interviews
Direct to Customer	Appliance Recycling	✓	✓	✓
	Online Marketplace	✓	✓	✓
	Packs	✓	✓	✓
	Retail	✓	✓	✓
Trade Ally	Heating and Cooling	✓	✓	✓
	Insulation and Air Sealing	✓	✓	✓
	Renewables			✓
New Construction	Residential New Construction			✓

More than 50,000 residential customers in Wisconsin participated in Focus on Energy's offerings in CY 2020, not including an estimated 834,000 Wisconsin customers who purchased lighting measures through the Retail and Rural Etail Events offerings.

As listed above in the summary of CY 2020 annual savings (Table 13), residential customers installed energy-efficient measures across a wide range of technologies and achieved verified gross electricity savings of 272,994,306 kWh and natural gas savings of 3,373,182 therms.

Customer Satisfaction

The evaluation team fielded satisfaction surveys online and by mail during CY 2020. Participants were asked to rate how satisfied they were with Focus on Energy's offerings on a scale from 0 to 10, where 10 meant *extremely satisfied* and 0 meant *extremely dissatisfied*. More than 25,000 Focus on Energy residential participants completed a survey in CY 2020.[6]

Participants in all ongoing offerings, except Appliance Recycling, gave higher or equivalent overall satisfaction ratings in CY 2020 compared to CY 2019. All average ratings in CY 2020 were 8.9 or higher. The largest increases in satisfaction were for the Retail Smart Thermostat offering (to 9.4 in CY 2020

[6] In total, 16,659 customers completed the Packs survey, 3,213 completed the Online Marketplace survey, and 3,191 completed the Trade Ally Solutions survey. Because the evaluation team reports ratings only to the first decimal place, surveys with more than 2,000 responses were randomly sampled so the precision level for statistical significance tests would not be narrower than 0.1 rating points, the minimum for a reported change in ratings. Without sampling, significance tests could indicate that two numbers that appear the same (to the first decimal place) are significantly different. The random sampling used a Monte Carlo technique so reported ratings for the random sample and the ratings for the larger population are identical to the first decimal place.

from 9.2 in CY 2019) and the Direct to Customer Packs offering (to 9.5 in CY 2020 from 9.4 in CY 2019). Participants in the Online Marketplace offering, which was surveyed for the first time in CY 2020, also reported high overall satisfaction, with a rating of 9.4.

The satisfaction ratings for most residential offerings in CY 2020 were statistically higher than the portfolio target of 8.9, except for Appliance Recycling (8.9), which was not statistically different from the portfolio target.[7]

In CY 2020, across all surveyed residential offerings, the participation-weighted average overall satisfaction was 9.4, which was statistically higher than the portfolio target.[8] This was an increase from the CY 2019 participation-weighted residential portfolio average of 9.3 as well as the residential portfolio average rating of 9.0 in the CY 2015-CY 2018 quadrennium.

Figure 9 shows average satisfaction ratings of surveyed participants for residential offerings in CY 2020 and CY 2019 along with the average ratings of the entire CY 2015-CY 2018 quadrennium.[9]

The evaluation team calculated a net promoter score (NPS) for each offering based on the likelihood of the participant to recommend it. The NPS is the percentage of promoters (respondents giving a rating of 9 or 10) minus the percentage of detractors (respondents giving a rating of 0 to 6) and is expressed as an absolute number between -100 and +100. Generally, a positive NPS is interpreted as good, indicating a higher proportion of promoters to detractors. The closer the NPS is to +100, the more favorable the respondents are toward the offering. NPS scores over +80 are considered excellent, while scores that dip below +50 warrant investigation into a potential opportunity for improvement.

The residential offerings received high ratings from participants, with an NPS at least +80 for all but two CY 2020 offerings. The Appliance Recycling offering had an NPS of +74 in CY 2020 (down from +90 in CY 2019) and Trade Ally Solutions had an NPS of +77 in CY 2020 (down from +82 in CY 2019). The highest scores for residential offering in CY 2020 were +86 to +88 NPS for the Packs, Retail Events, Retail Smart Thermostats, and Online Marketplace offerings.

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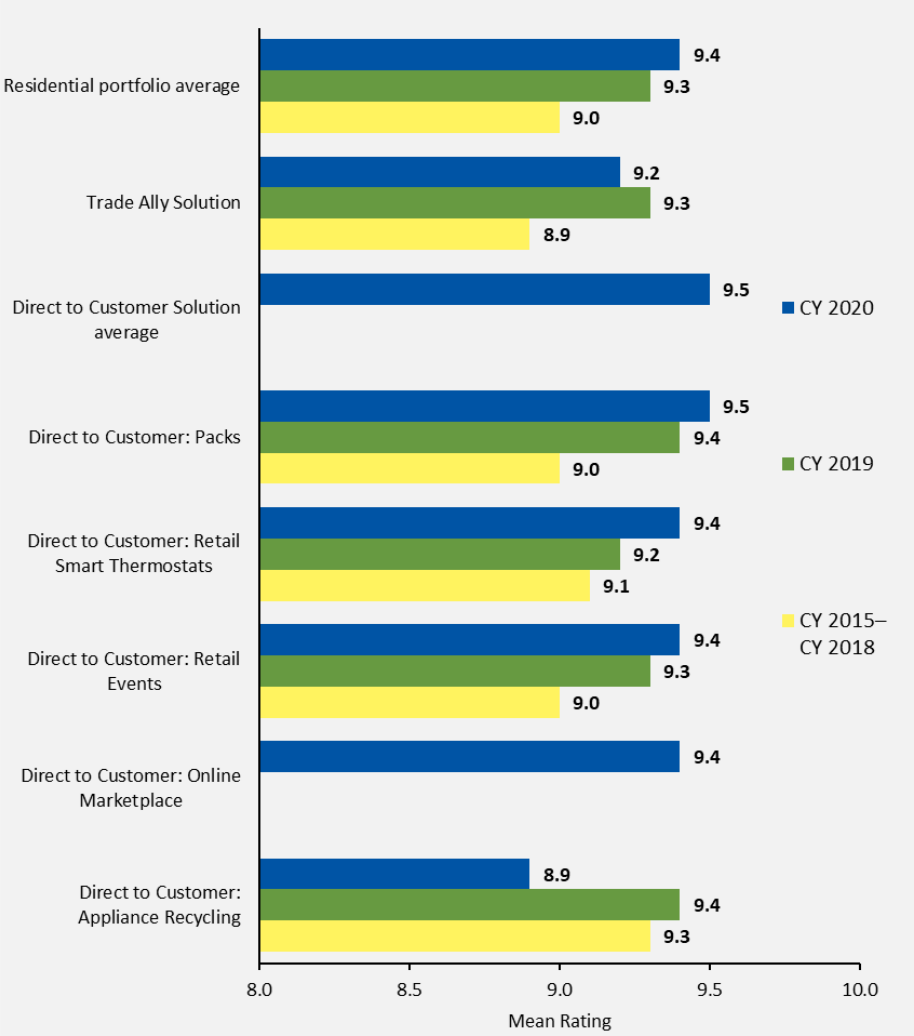
[7] $p<0.05$ using binomial *t*-tests.

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

[9] Ongoing participant satisfaction surveys were restructured in CY 2020 to match the restructuring of the portfolio. The CY 2020 Trade Ally Solutions survey is compared to a weighted average of past results from the Home Performance with ENERGY STAR Whole Home and HVAC path surveys and the Renewable Rewards survey. All offerings in the Direct to Customer Solution were compared to their equivalent CY 2019 predecessor programs, except for the Online Marketplace, which was not surveyed prior to CY 2020.

Figure 9. CY 2020 Average Overall Satisfaction Ratings for Residential Offerings



Source: Ongoing Participant Satisfaction Mail/Online Survey Question. "Overall, how satisfied are you with your most recent experience with Focus on Energy?" Trade Ally Solutions CY 2019 (n=1,854 weighted average of three predecessor programs), CY 2020 (n=1,344); Packs CY 2019 (n=1,336), CY 2020 (n=1,199); Retail Smart Thermostats CY 2019 (n=804), CY 2020 (n=428); Retail Events CY 2019 (n=175), CY 2020 (n=801); Online Marketplace CY 2020 (n=1,069); Appliance Recycling CY 2019 (n=1,561), CY 2020 (n=749). The Online Marketplace survey was not fielded before CY 2020. The Direct to Customer Solution average was not calculated for years prior to CY 2020.
Total CY 2015-CY 2018 is the participation-weighted average for all years in the quadrennium that the program was active. The residential portfolio average and Direct to Customer Solution average are the averages of all offerings surveyed during the year weighted by total participation.

Awareness

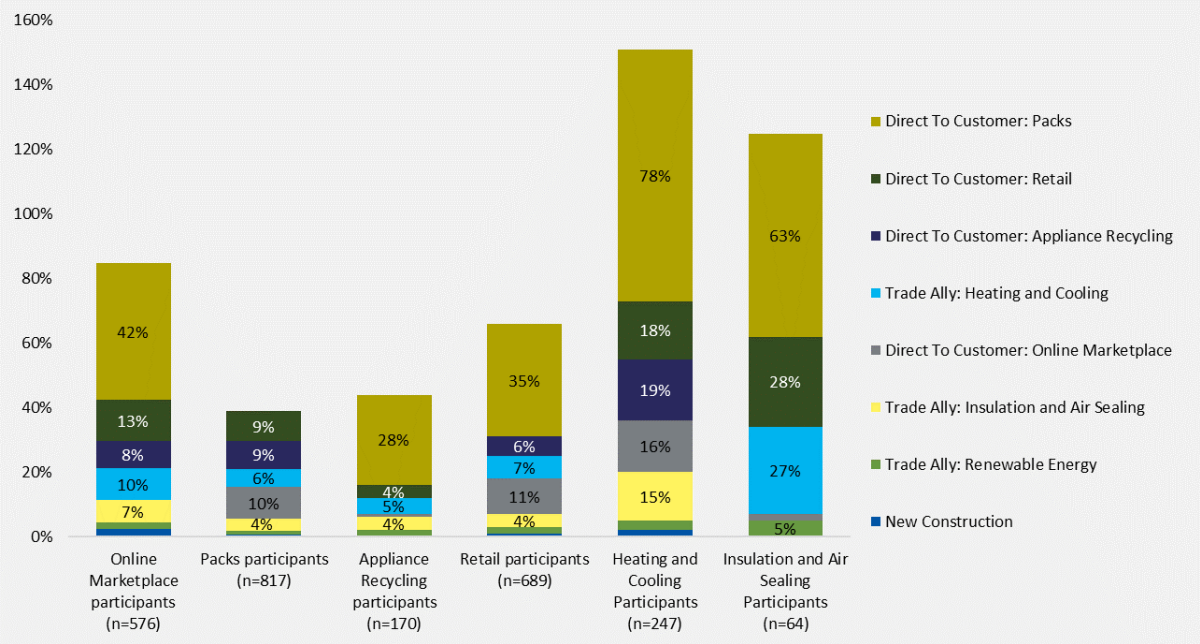
In addition to the ongoing customer satisfaction survey (conducted monthly during the calendar year), the evaluation team fielded a single survey for specific offerings to collect information on customer awareness channels and demographics, motivations to participate, specific behaviors related to measures, and other information. Table 17 lists target groups and sample sizes for the annual survey.

Table 17. Annual Residential Participant Survey Conducted in CY 2020

Survey Title	n	Mode
Appliance Recycling	173	Phone
Heating and Cooling	446	Online
Insulation and Air Sealing	152	Phone
Online Marketplace	576	Online
Packs	884	Online
Retail (Smart Thermostats) and Etail	777	Online

Surveys asked respondents if they had participated in other Focus on Energy offerings. Figure 10 shows the level of participation in different offerings by survey group. The level of participation varied by offering, with most common cross-participation being in the Packs and Retail offerings.

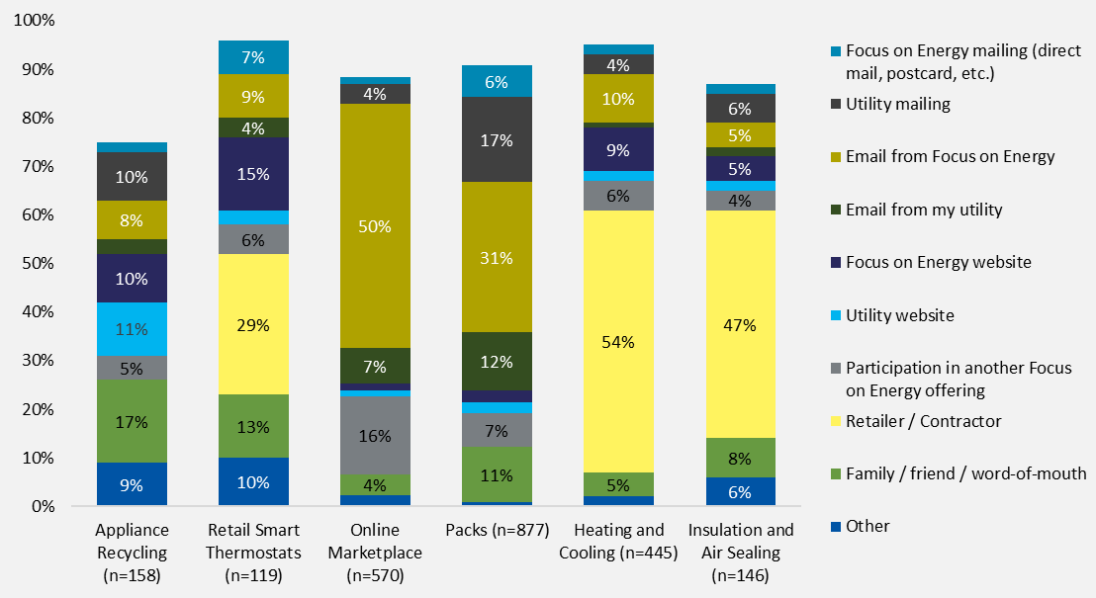
Figure 10. Focus on Energy Offering Participation by Survey Group



Sources: Packs, Online Marketplace, Retail, and Insulation and Air Sealing Participant Surveys. "For the Focus on Energy offerings listed below, please indicate which ones you are aware of and which you have participated in." Appliance Recycling and Heating and Cooling. "Which program(s) or offering(s) have you participated in?" Multiple responses allowed.
Note: Chart shows each survey group's awareness by offering; therefore, columns will not sum to 100%.

Figure 11 shows the top 10 ways respondents most recently heard about the offering in which they participated. The distribution of mentions of each source varied by offering. Most common sources for the Retail Smart Thermostats, Heating and Cooling, and Insulation and Air Sealing participants were the retailer or contractor and word of mouth. The most common sources for Packs and Online Marketplace offerings were an email from Focus on Energy or the respondent's utility.

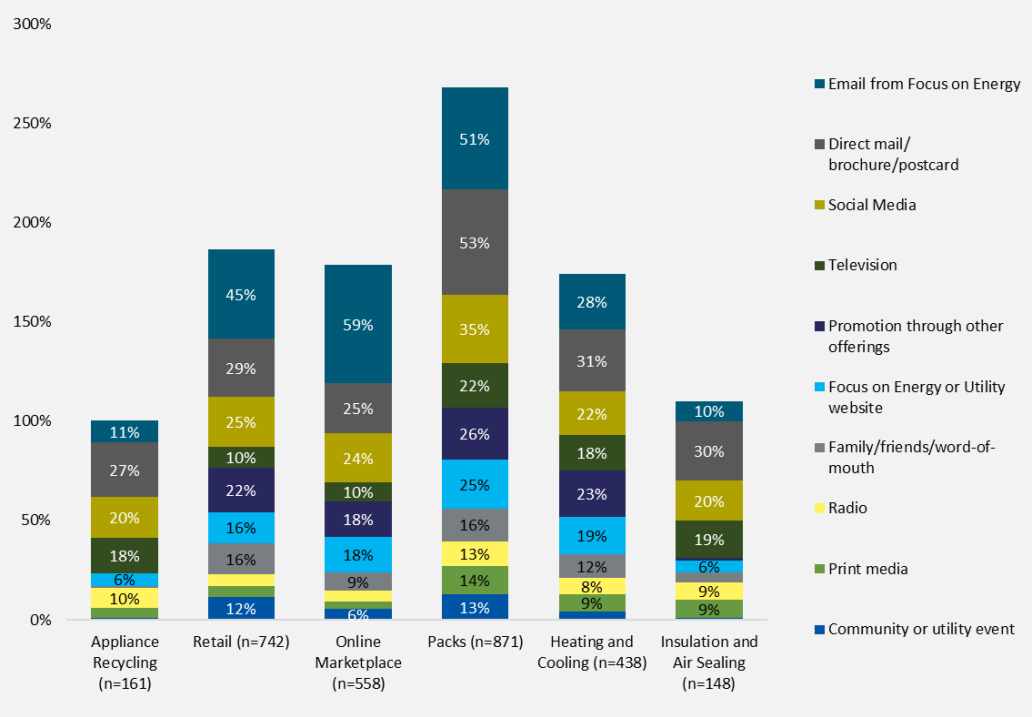
Figure 11. Most Recent Sources of Information about Focus on Energy Offering



Source: Participant Survey Question. "Where did you most recently hear about Focus on Energy's [Offering Name]?" (single response). Note: Chart shows each survey group's awareness by program; therefore, columns will not sum to 100%.

Figure 12 shows survey respondents' top 10 preferred sources of information about Focus on Energy offerings. Across all offerings, the top preferred sources were an email from Focus on Energy, direct mail, and social media.

Figure 12. Preferred Sources of Information about Focus on Energy



Source: Participant Survey Question. "What do you think is the best way for Focus on Energy to inform the public about energy efficiency programs? Select all that apply."

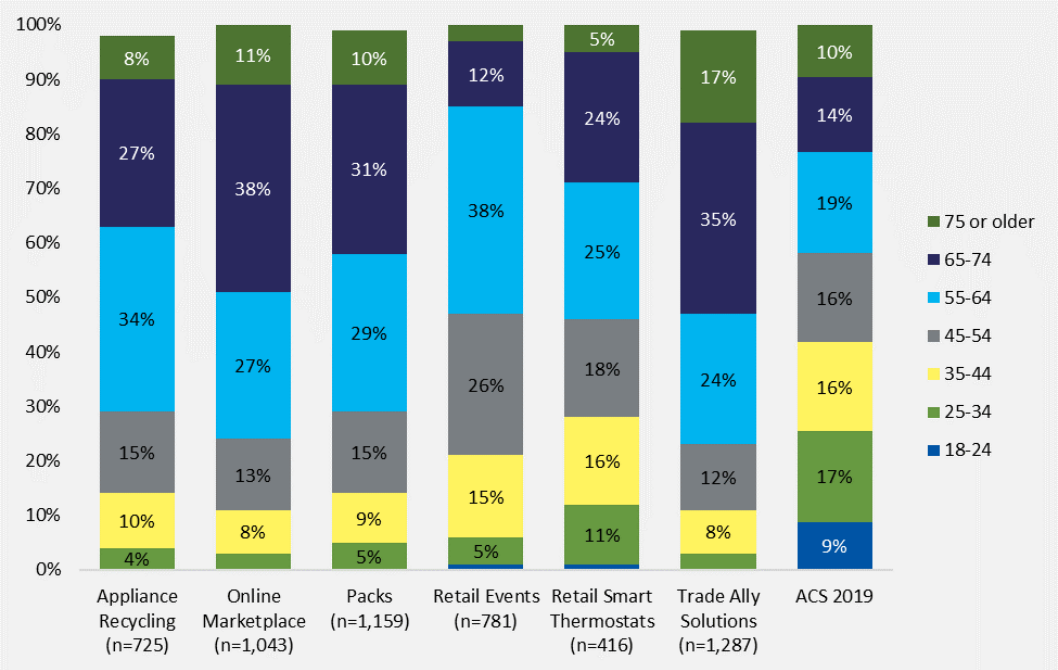
Customer Profile

The evaluation team assessed what market segments are participating in each offering and to what extent the offerings are reaching all segments of the market. The team used demographic data from ongoing customer satisfaction surveys and participant surveys and data from the U. S. Census Bureau's 2019 American Community Survey in Wisconsin.

Figure 13 shows the age distribution of survey respondents by offering and the age distribution of Wisconsin residents, according to the 2019 American Community Survey data.[10] The American Community Survey data indicate that the Wisconsin population is relatively evenly distributed across all age ranges. However, most of Focus on Energy's offerings served participants concentrated in the 55 to 74 age range. The exception is the Retail Smart Thermostat offering, in which customers were more evenly distributed across all age ranges over 25.

[10] U.S. Census. "Wisconsin." Accessed April 2021. https://data.census.gov/cedsci/profile?g=0400000US55

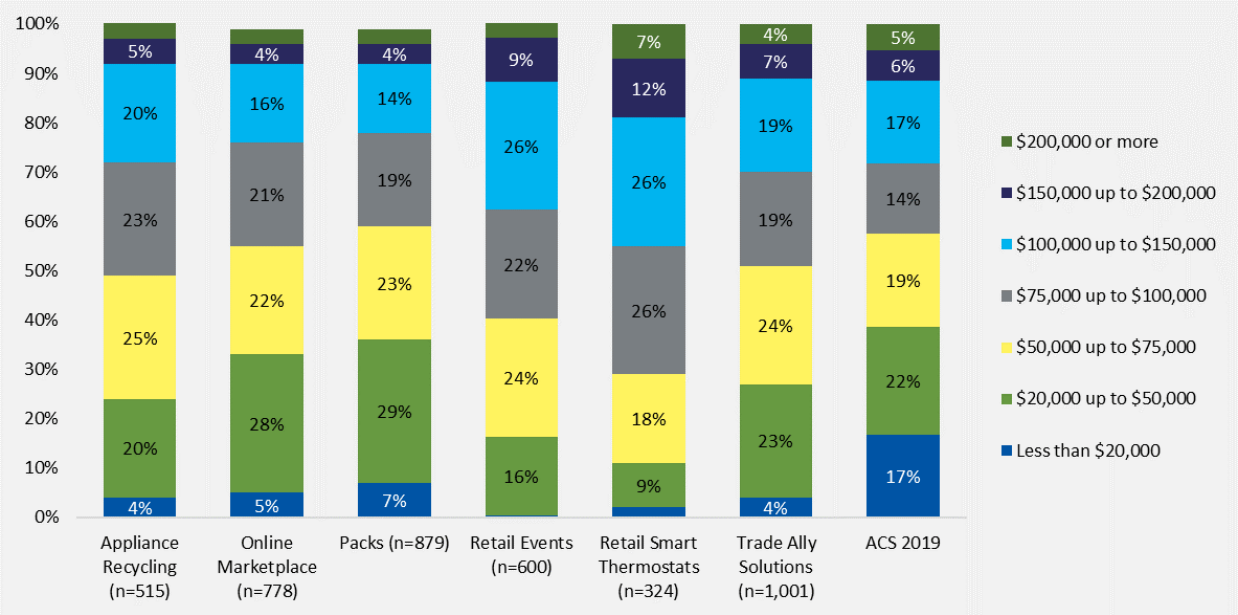
Figure 13. Age of Survey Respondents



Sources: Packs, Online Marketplace, Retail Smart Thermostats, Retail Events, and Appliance Recycling Offering, and Trade Ally Solutions Participant Satisfaction Survey Question. "Which of the following categories best represents your age?" and U. S. Census American Community Survey data, 2019.

Figure 14 shows the income range of participants relative to the general population. The American Community Survey data show that Wisconsin residents are fairly evenly distributed across all income levels up to $150,000, with smaller percentages of residents above $150,000. Focus on Energy offerings reflect this distribution fairly well but are slightly less likely to include customers in the lowest income bracket. Retail Smart Thermostat participants are more likely to be in higher income brackets, while Packs and Online Marketplace participants are slightly more likely to be in lower income brackets.

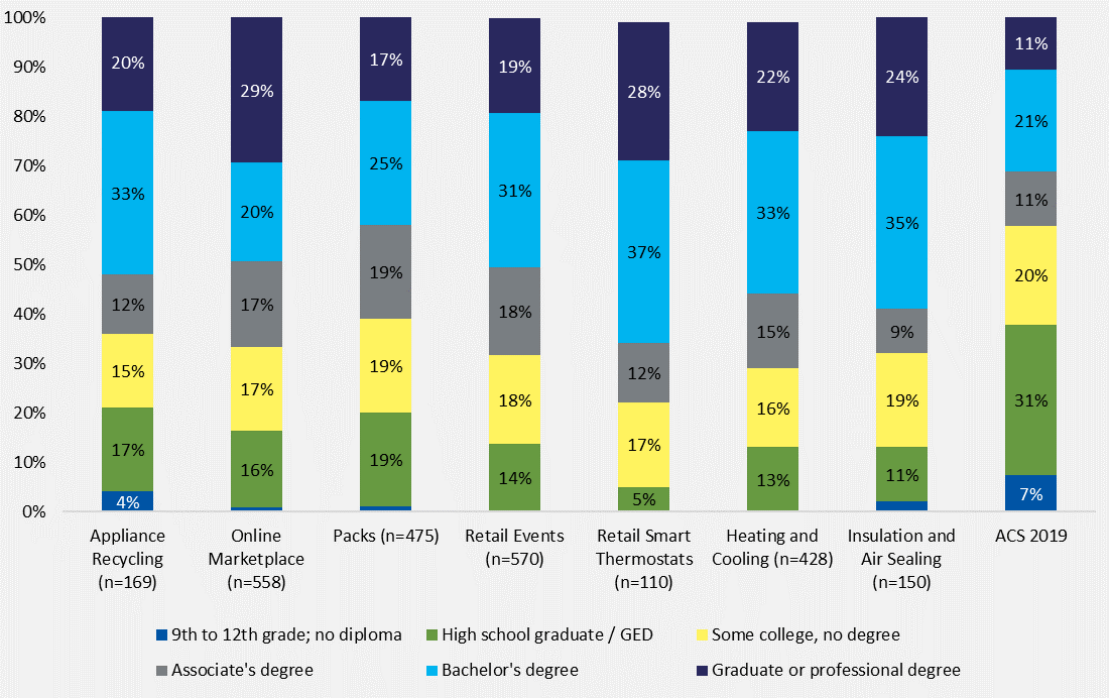
Figure 14. Income Level of Survey Respondents



Source: Packs, Online Marketplace, Retail Smart Thermostats, Retail Events, and Appliance Recycling Offering and Trade Ally Solutions Participant Satisfaction Survey Question. "Which category best describes your total household income before taxes?" and U. S. Census American Community Survey data, 2019

Figure 15 compares the level of education of participants to the general population. American Community Survey data show that 43% of Wisconsin residents have an associate's degree or above compared to 61% or more of customers served by Focus on Energy offerings. Similarly, residents with a high school diploma or below are less likely to participate in the Focus on Energy offerings. The educations level of online offerings (Online Marketplace and Packs) is most similar to the general population.

Figure 15. Level of Education of Survey Respondents



Source: Participant Survey Question. "What is the highest level of school that you have completed?" and U. S. Census American Community Survey data, 2019

COVID-19 Impacts

In response to COVID-19, Focus on Energy temporarily suspended all in-person field activities in March 2020. Offerings that required personal contact were quickly reopened with contactless designs, such as curbside pick-up for the Appliance Recycling offering and shifting the Retail pop-up events to online Etail events.

In July 2020, the administrator reported participation had increased in CY 2020, possibly because customers were spending more time at home and giving more thought to home improvements. Though this increase did not necessarily reflect the full year because COVID-19 impacts changed regularly, it is true most residential offerings did not experience a significant decrease in participation. There were two exceptions:

- Appliance Recycling participation would likely have been affected by the discontinuation of the incentive in CY 2020. However, it was further impacted by curbside pick-up requirements, implemented in response to COVID-19, that prevented some customers from participating because they were unable to move their appliance outside.
- Residential New Construction was affected by shortages in labor and construction materials.

Online offerings experienced significant increases in participation, most notably the Packs offering, which increased over 70% compared to CY 2019.

The survey also asked Heating and Cooling offering respondents about the impact of COVID-19 on their energy usage and participation. Nearly two-thirds (64%) of respondents reported not noticing an increase in their home energy usage due to staying at home more because of the pandemic. Nearly all (98%) reported not having trouble purchasing the brand they wanted to install, despite rumors about supply chain issues. Similarly, 95% of Insulation and Air Sealing survey respondents reported not having difficulty finding a contractor or auditor during the pandemic.

Nonresidential Segment Process Evaluation Findings

For the CY 2020 nonresidential program evaluation, the evaluation team conducted phone surveys and in-depth interviews to assess customer experience and offering attribution and to gather feedback on the new portfolio structure. As in other years of the quadrennium, the team also conducted online and mail-in satisfaction surveys with all nonresidential participants. The administrator conducted a cross-cutting survey for all nonresidential and residential trade allies involved with Focus on Energy, and these results are also summarized in this section.

Customer Satisfaction

During CY 2020, the administrator and the evaluation team fielded satisfaction surveys online and by mail that asked participants to rate how satisfied they were with Focus on Energy's offerings. The surveys used a scale from 0 to 10, where 10 meant *extremely satisfied* and 0 meant *not at all satisfied*. More than 1,000 Focus on Energy nonresidential participants completed a survey in CY 2020. Figure 16 shows participants' average satisfaction ratings with nonresidential offerings.[11]

For the CY 2020 nonresidential offerings, participants gave average satisfaction ratings ranging from 9.3 for the Business and Industry and Schools and Government solutions to 9.0 for the New Construction Prescriptive offering. Ratings were statistically higher than the portfolio target of 8.9 for the former and statistically equivalent to the portfolio target for the latter.[12] In CY 2020, across all nonresidential offerings surveyed, the participation-weighted average overall satisfaction rating was 9.3, significantly above the portfolio target.[13] The CY 2019 participation-weighted nonresidential portfolio average was also 9.3. In the CY 2015-CY 2018 quadrennium, nonresidential portfolio average rating of 9.0.

The evaluation team calculated an NPS for each offering based on the likelihood of the participant to recommend it. Generally, a positive NPS is interpreted as good, and the closer the NPS is to +100, the more favorable the respondents are toward the offering. All three nonresidential offerings surveyed

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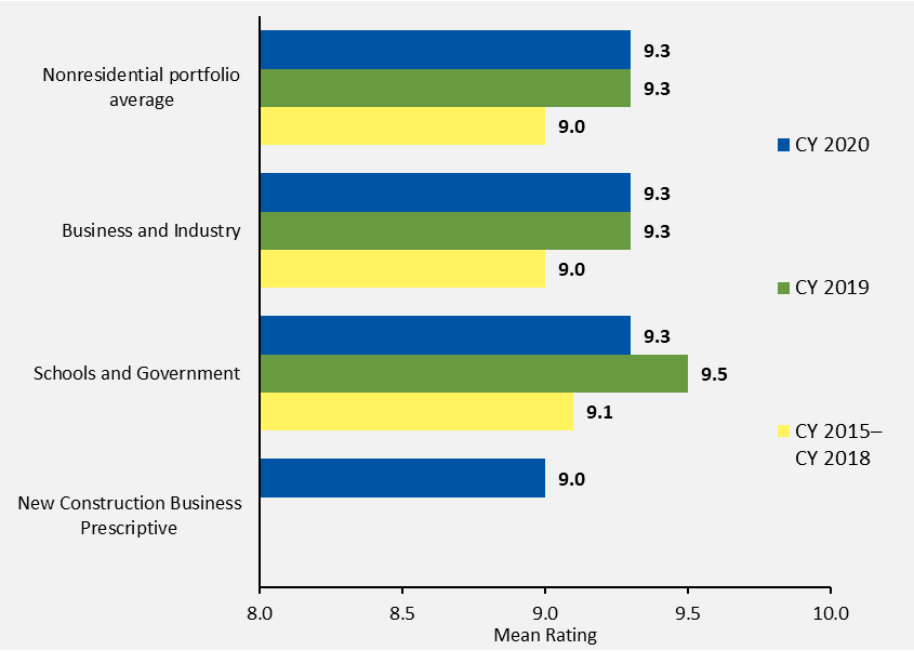
[11] Ongoing participant satisfaction surveys were restructured in CY 2020 to match the new portfolio structure. The CY 2020 Business and Industry Solution survey is compared to a weighted average of past results from the Business Incentive, Large Energy Users, Small Business, Multifamily Energy Savings, and Agribusiness surveys. Schools and Government Solution surveys for CY 2020 are compared to past results from the Agriculture, Schools and Government survey. The New Construction Business Prescriptive survey was fielded for the first time in CY 2020.

[12] $p<0.05$ using binomial *t*-tests.

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

received a high NPS. The Schools and Government Solution had the highest NPS at +90, and the New Construction Business Prescriptive offering had the lowest NPS at +80.

Figure 16. CY 2020 Average Overall Satisfaction Ratings for Nonresidential Offerings



Source: Ongoing Participant Satisfaction Mail/Online Survey Question. "Overall, how satisfied are you with your most recent experience with Focus on Energy?" Business Incentive CY 2019 (n=1,339 weighted average of three predecessor programs), CY 2020 (n=848); Schools and Government CY 2019 (n=263), CY 2020 (n=208); New Construction Business Prescriptive CY 2020 (n=25). The New Construction Business Prescriptive survey was not fielded before CY 2020. Total CY 2015-CY 2018 is the participation-weighted average for all years in the quadrennium that the program was active. The nonresidential portfolio average is the average of all programs surveyed during the year weighted by total program participation.

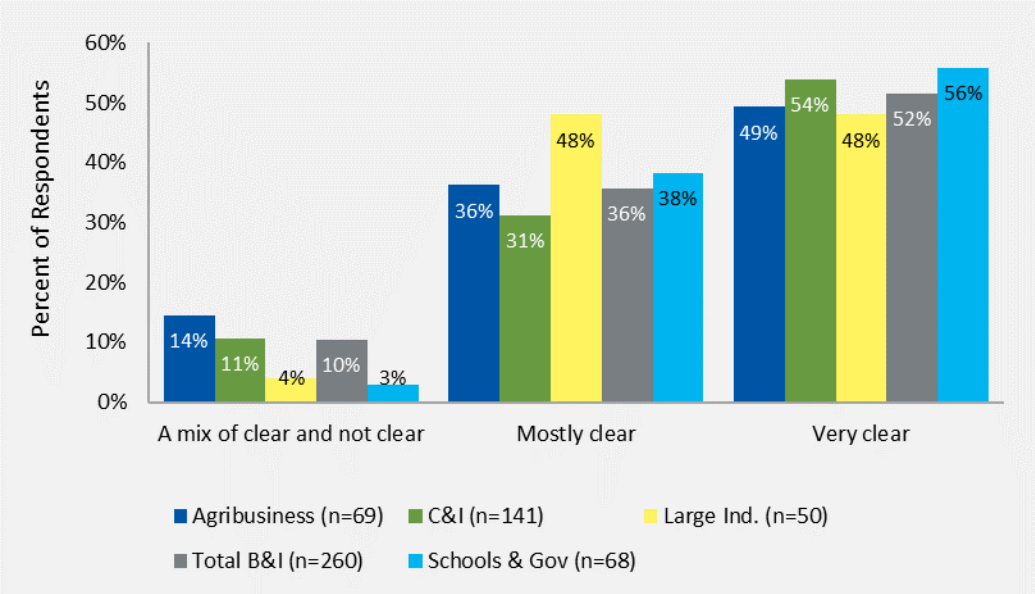
Participant Experience

The evaluation team completed phone surveys with participants in the Commercial and Industrial (C&I), Agribusiness, and Large Industrial offerings in the Business and Industry Solution and in the Schools and Government Solution. This section compiles information about key topics from questions that were asked consistently across surveys. The team also completed in-depth interviews with a small sample of nonresidential New Construction participants, but because these questions differed from other solutions, the results are not included in this compilation.

Experience with the New Portfolio Structure

The surveys included several questions about the new portfolio structure, which changed in 2020 to streamline participant experience with Focus on Energy. The administrator was interested in understanding how easy it was for prospective participants to learn about project eligibility and engage with the offerings. The survey results show the experience was straightforward for most projects, with over 85% of participants stating project eligibility information was either *very clear* or *mostly clear*. Not presented in Figure 17 is few participants who said the information was either *mostly not clear* or *not clear at all*, which occurred in just 4% of C&I and 3% of Schools and Government participants.

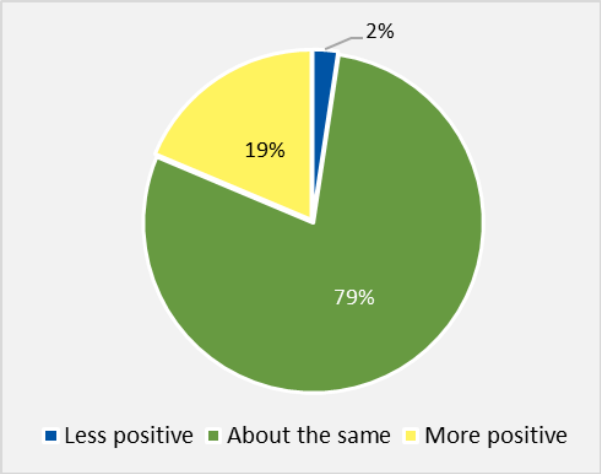
Figure 17. CY 2020 Nonresidential Participant Rating of Program Eligibility Information



Source: CY 2020 Participant Survey QB5. "How would you describe your experience in learning about whether your project or equipment qualified for a Focus on Energy incentive? Would you say that project eligibility information was…"

The surveys found a large proportion of nonresidential participants in the Schools and Government and Business and Industry solutions had previously engaged with Focus on Energy in some way. Between 22% and 45% of Business and Industry respondents (percentages differed by offering) and 64% of Schools and Government respondents participated previously. To further explore the new portfolio structure, the survey asked these repeat customers how their experience in 2020 compared to prior experience. Results were positive, with 19% of respondents across all solutions and offerings reporting an improvement in their experience (Figure 18). Results by offering were similar—between 17% and 21% of respondents in each offering reported an improved experience.

Figure 18. Nonresidential Experience with Focus on Energy Compared to Prior Years

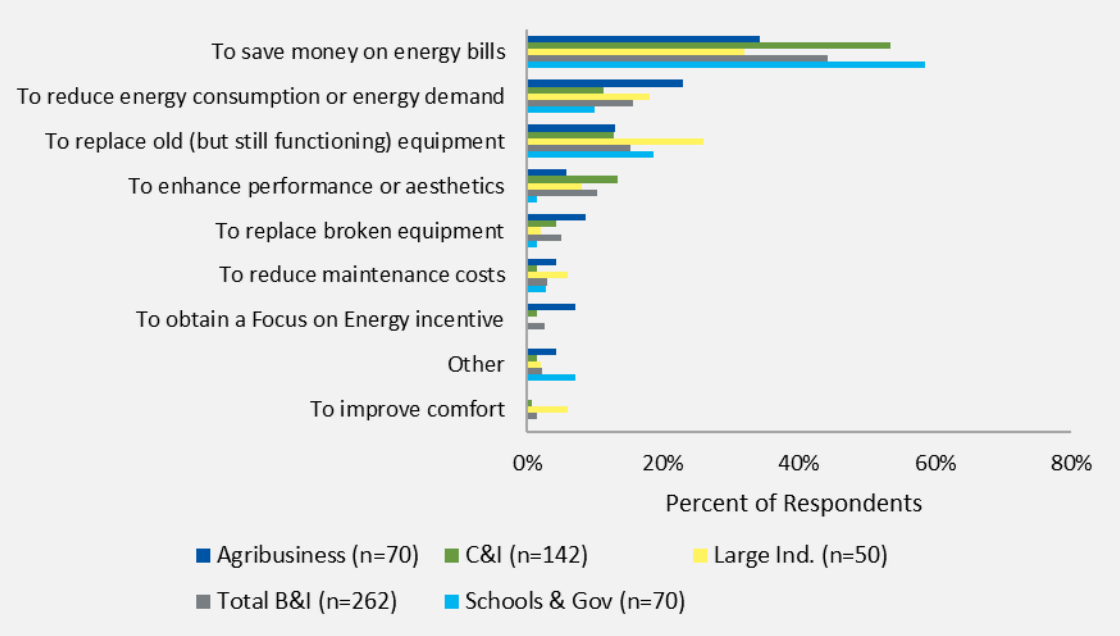


Source: CY 2020 Participant Survey QB8. "Overall, how would you say your experience with Focus on Energy was this year compared to prior years? Would you say it was…. (n=209). Data compiled from C&I, Agribusiness, Large Industrial, and Schools and Government surveys.

Motivations for Pursuing Energy Efficiency

A key driver for completing energy-efficient projects for all participants was to save money on energy bills, though there was some variance in customer motivations by offering. Customers who participated in the Agribusiness and Large Industrial offerings were less influenced by energy cost savings than other participants, and more influenced by a desire to reduce energy use. Large Industrial participants were particularly motivated to replace old, but still functioning, equipment. Participants in the C&I offering were much more likely to want to enhance equipment performance or aesthetics than were other participants, especially compared to Schools and Government customers.

Figure 19. Nonresidential Motivations for Energy Efficiency Projects

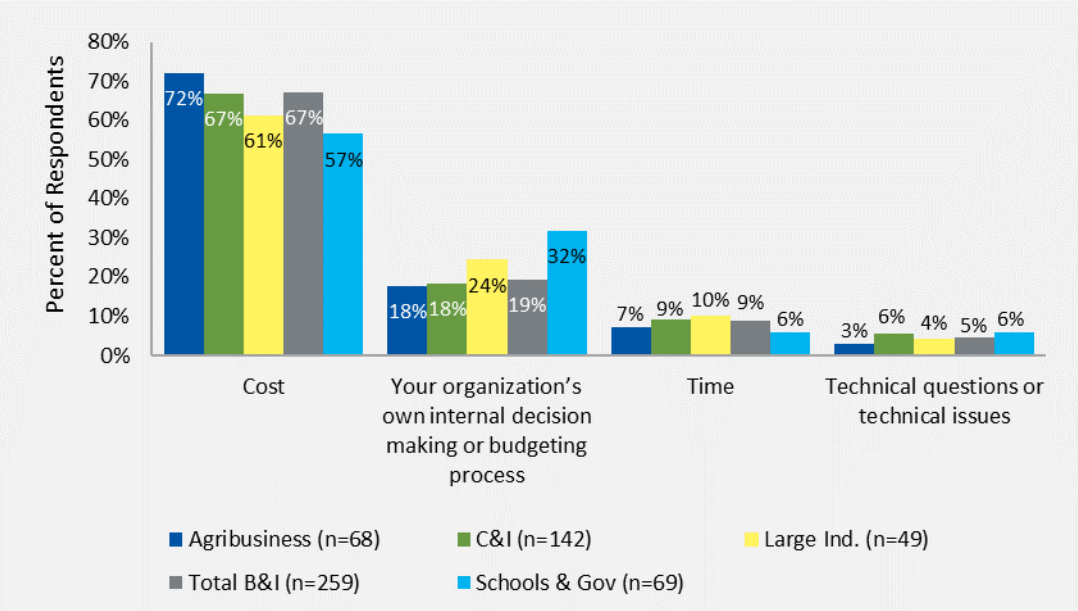


Source: CY 2020 Participant Survey QC1. "What factor was most important to your company's decision to make the energy-efficient upgrades for which you received an incentive?"

Challenges in Pursuing Energy Efficiency

The evaluation team listed four key well-known barriers to energy efficiency that nonresidential customers often face and asked respondents to pick the single largest challenge for their organization. Across all offerings, the overwhelming response was cost. Technical issues were cited least often as the largest barrier (Figure 20). When asked what could be done to overcome issues, respondents cited higher incentives, upfront discounts, and more program information.

Figure 20. Challenges to Implementing Energy Efficiency Improvements



Source: CY 2020 Participant Survey QD1. "If you had to choose just one, what would you say is normally the largest challenge in implementing energy efficiency projects and upgrades at your organization? Would you say…"

Trade Ally Experience

In CY 2020, the administrator completed a survey with 232 trade allies who served nonresidential and residential markets and who provided feedback about their experience. Respondents mostly represented these services—HVAC (34%), lighting (31%), and electrical (28%). Table 18 shows the customer type surveyed trade allies typically serve.

Table 18. CY 2020 Trade Ally Respondents by Customers Served

Customer Type	Respondents (n)	Percentage of Total
Primarily Businesses [a]	106	46%
Primarily Residential	88	38%
Mixed [b]	38	16%
Total	**247**	**100%**

[a] Includes trade allies serving other nonresidential customers, such as dairy farms, public entities, industrial facilities, and large energy users.
[b] Captures trade allies who did not report serving "Primarily Residential" or "Primarily Businesses" but instead reported serving a mix of both residential and business customers..

Satisfaction with Focus on Energy

Trade allies reported high satisfaction levels, with more than 80% of respondents providing a rating of 4 or 5, using a 1 to 5 scale in which 1 is *very dissatisfied* and 5 is *very satisfied.* Table 19 lists trade ally satisfaction levels by the type of customer served.

Table 19. CY 2020 Trade Ally Satisfaction Levels by Type of Customer Served

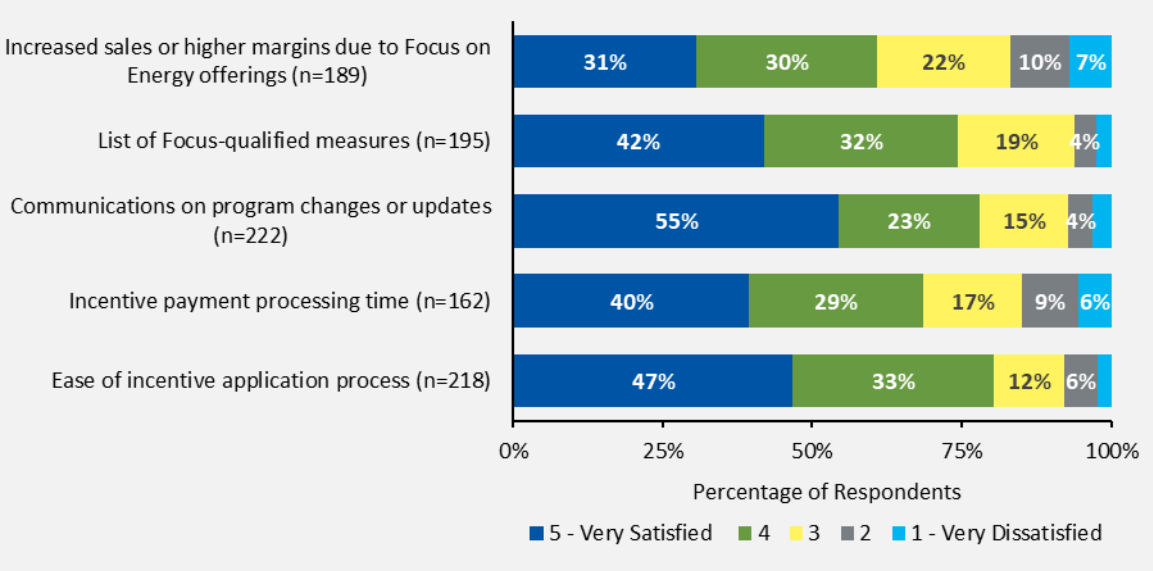
Program	Primarily Business (n=106)	Primarily Residential (n=88)	Mixed (n=38)	Total (n=232)
5 - Very Satisfied	49	37	20	106
4	35	35	14	84
3	11	12	2	25
2	6	3	2	11
1 - Very Dissatisfied	5	1	0	6

Source: CY 2020 Trade Ally Survey Question, "Overall, how satisfied are you with Focus on Energy?"

Of the 17 trade allies who provided a rating of 2 or less, approximately half were concerned about recent changes, specifically decreased incentives, and approximately one-third were frustrated with the complexity of the project approval process. Many trade allies who primarily served business customers were dissatisfied about the discontinuation of the Small Business Program (CY 2017-CY 2019), which resulted in a decrease in incentives for customers who had qualified for it. Several customers perceived the changes indicated Focus on Energy is placing less value on maintaining strong trade ally relationships and creating an offering that is mutually beneficial.

Trade allies were asked to rate their satisfaction with five specific aspects of the solutions and responses varied, as shown in Figure 21. They gave *very satisfied* and *satisfied* ratings for ease of incentive application process (80%, n=218) and communications on changes or updates (78%, n=222). They expressed the lowest satisfaction with incentive payment processing time and increased sales or higher margins due to Focus on Energy offerings.

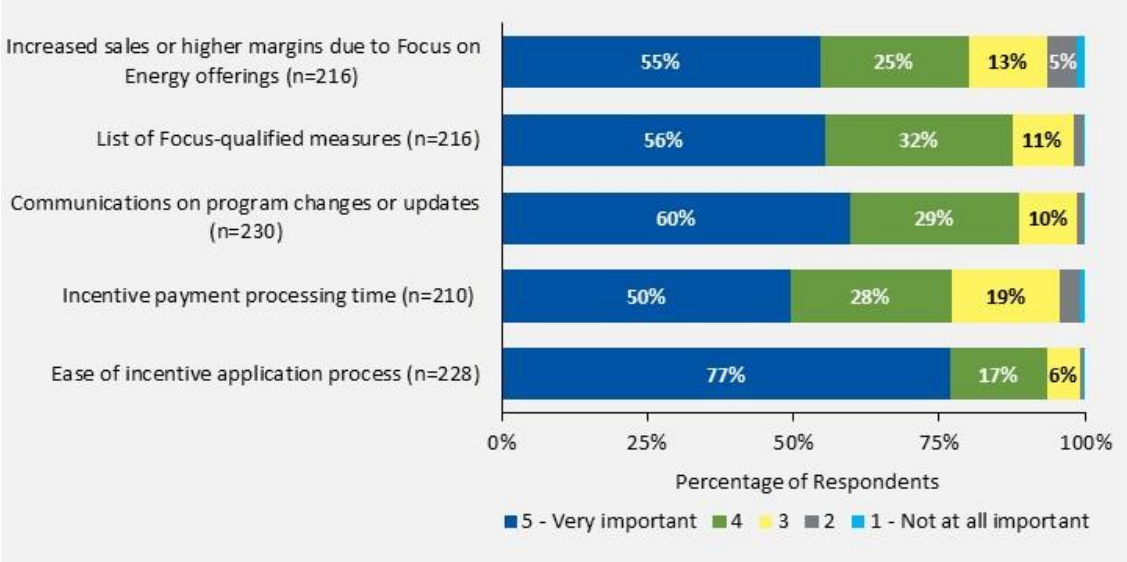
Figure 21. CY 2020 Trade Ally Satisfaction by Solution Aspects



Source: CY 2020 Trade Ally Survey Question, "Overall, how satisfied are you with the following?"

When asked about the importance of each of these solution aspects (Figure 22), 77% (n=228) of respondents agreed that ease of incentive application process was *very important.* They rated increased sales or higher margins due to Focus on Energy offerings as *not at all important* (6%, n=216).

Figure 22. CY 2020 Importance of Solution Aspects to Trade Allies

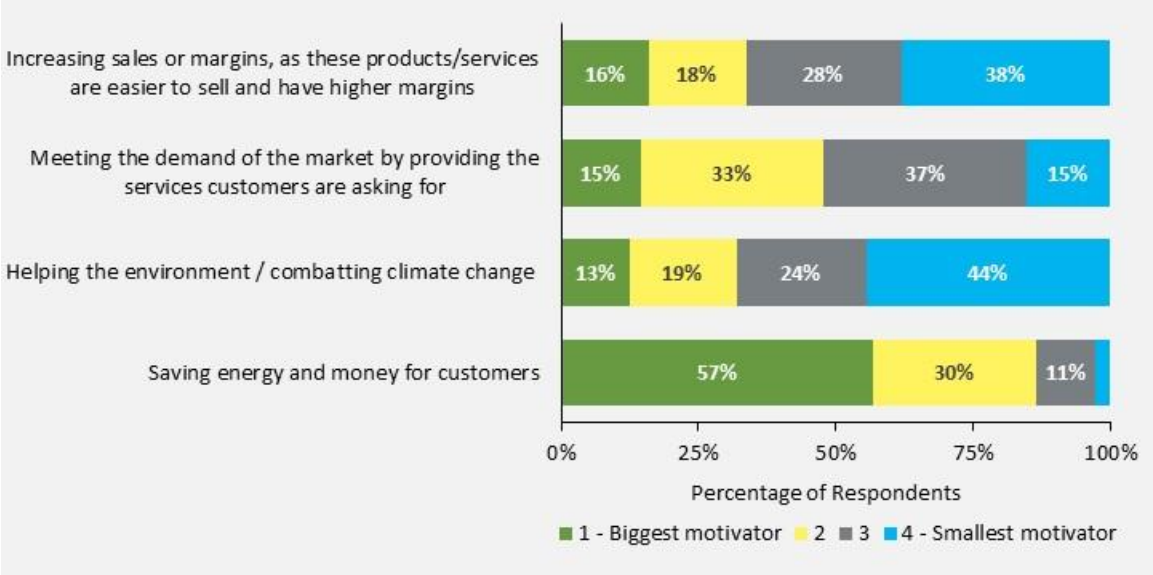


Source: CY 2020 Trade Ally Survey Question, "How important are the following to you?"

Trade Ally Motivations

When asked about what motivated trade allies to sell energy-efficient or renewable energy products or services, 57% (n=232) of respondents rated saving energy and money for customers as the *biggest motivator*. In comparison, the *smallest motivator* was helping the environment and combatting climate change (44%) and increasing sales or margins (38%).

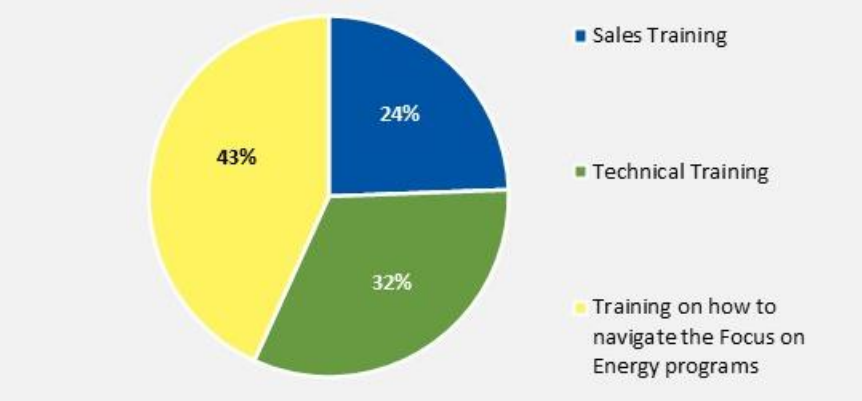
Figure 23. CY 2020 Motivating Factors for Trade Allies



Source: CY 2020 Trade Ally Survey Question, "Rank your motivation for selling energy efficiency or renewable energy products or services." (n=232)

Trade ally respondents also expressed interest in training provided by Focus on Energy. Most said training that helped them navigate the Focus on Energy programs was most beneficial (Figure 24).

Figure 24. CY 2020 Most Beneficial Trainings to Trade Allies

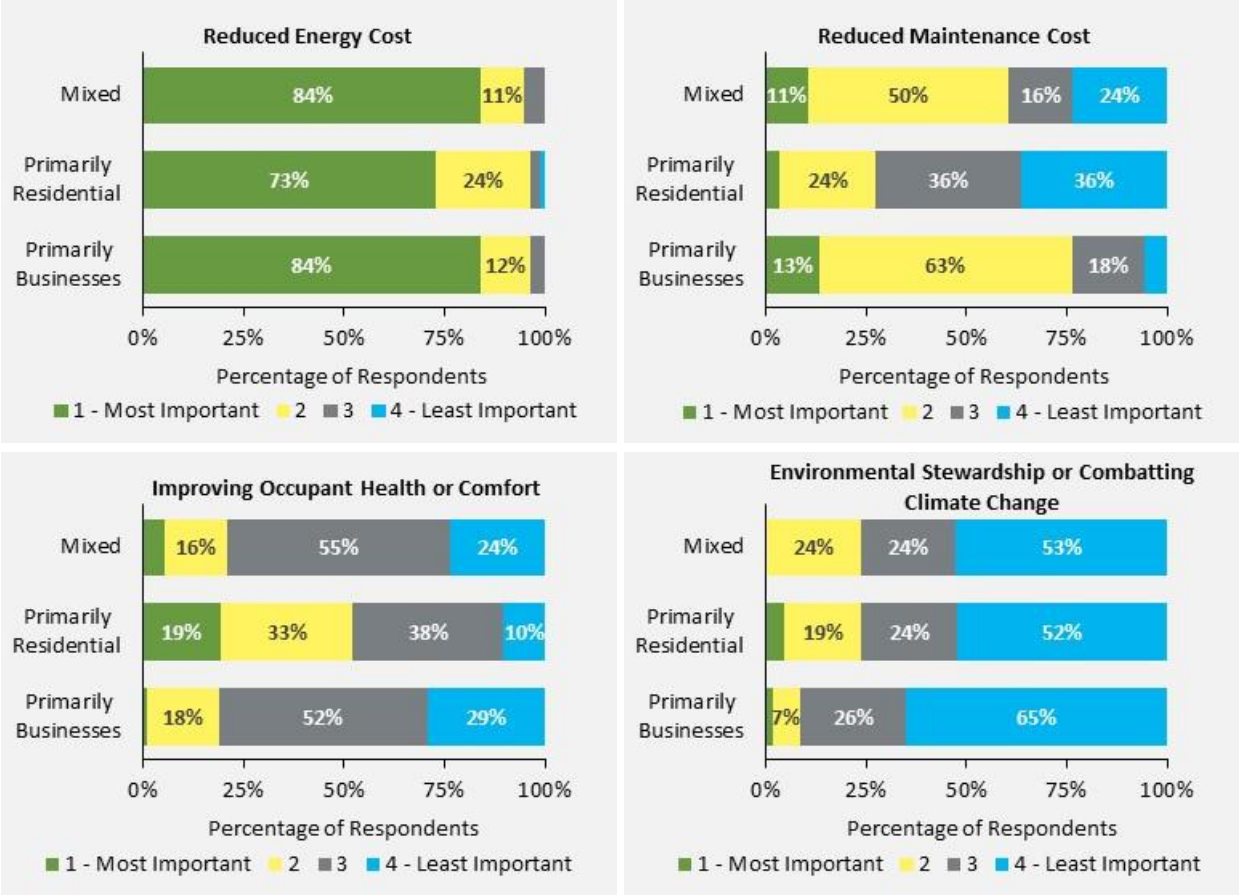


Source: CY 2020 Trade Ally Survey Question, "What type of training would you find most beneficial to your business?" (n=213)

Customer Motivations

Trade allies' feedback on what they believe are the greatest motivations for customers to install energy efficiency or renewable energy technology produced several noticeable patterns when analyzing results across primary customers served (Figure 25). Most respondents agreed the top driver for customer participation was reducing energy costs. Respondents who primarily served business customers said the desire to reduce maintenance costs was another top driver. Respondents who primarily served residential customers said the desire to improve occupant health or comfort was more influential.

Figure 25. CY 2020 Motivating Factors for Customers



Source: CY 2020 Trade Ally Survey Question, "What do you feel is the biggest motivator for your customers installing efficiency and renewable projects?" n=38 (mixed customers); 88 (primarily residential customers); 106 (primarily business customers)

Across all trade ally respondents, there was agreement that the *most important* motivator for customers completing energy efficiency and renewable energy projects was reducing energy costs. The *least important* motivator was environmental stewardship and combating climate change, though respondents perceived this benefit was more important for residential customers than for nonresidential customers.

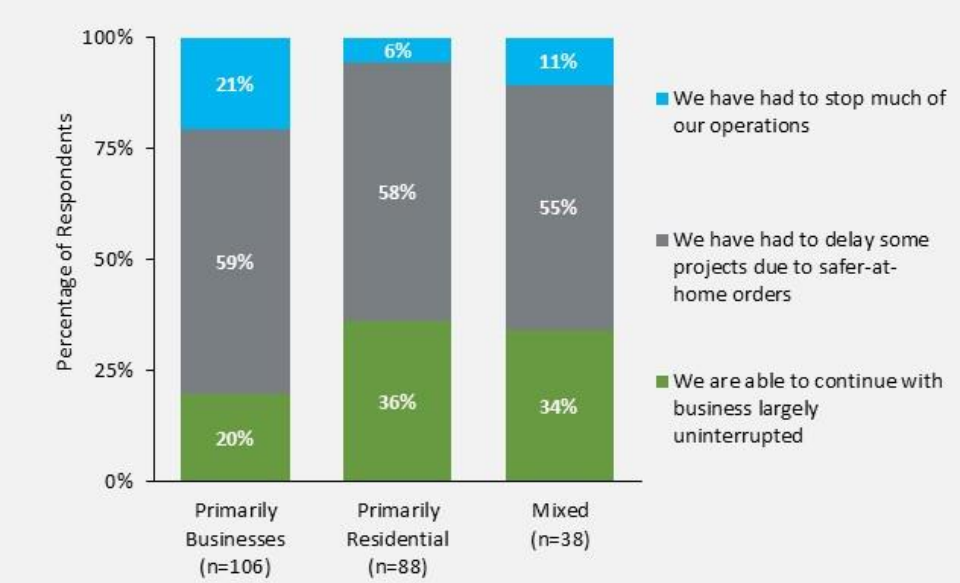
However, trade allies' feedback differed by the type of customers served for two specific motivating factors: reduced maintenance cost and improving occupant health or comfort. Only 27% (n=88) of respondents who primarily served residential customers rated reduced maintenance cost as *most important* or *important*, compared to 76% (n=106) who primarily served businesses and 61% (n=38) who served a mix. On the other hand, more than 50% (n=88) of respondents serving primarily residential customers believed improving occupant health or comfort was the *most important* or an *important* motivator for residential customers, compared to only 19% (n=106) of respondents who primarily serve businesses and 21% (n=38) who serve a mix of customer types.

Barriers to Energy Efficiency and COVID-19 Impacts

When asked about perceived barriers for their customers to install energy efficiency or renewable energy technology, most trade ally respondents reported upfront cost as the biggest barrier and difficulty in understanding the benefits of energy efficiency was the smallest barrier. Many respondents also reported new barriers during the COVID-19 pandemic.

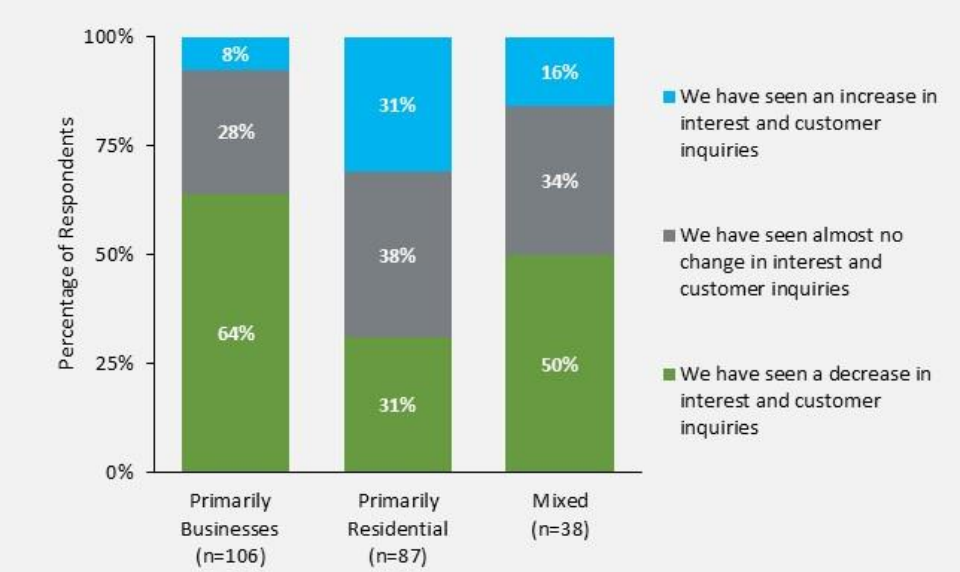
When asked about the impact of COVID-19 on their business operations, trade allies who worked primarily with business customers reported the biggest impact. Twenty-one percent (n=106) reported having to stop much of their operations, and 64% reported seeing a decrease in customer interest and inquiries (Figure 26). Impacts on trade allies in the residential sector appeared to be much smaller, with nearly 70% (n=87) reporting customer inquiries had either increased or remained steady (Figure 27).

Figure 26. CY 2020 COVID-19 Pandemic Business Impacts



Source: CY 2020 Trade Ally Survey Question, "How would you characterize how the COVID-19 pandemic has affected your business?"

Figure 27. CY 2020 Customer Response to COVID-19 Pandemic



Source: CY 2020 Trade Ally Survey Question, "How would you characterize your customers' response to the COVID-19 pandemic?"

Cost-Effectiveness Findings

With the oversight of and in collaboration with the PSC and the evaluation team, the Focus on Energy administrator developed a specific cost-effectiveness calculator for the CY 2019 - CY 2022 quadrennium. The administrator and implementers used the calculator to assess the cost-effectiveness of solutions' designs prior to their implementation each year.

To maintain consistency between planning and evaluation approaches—critical for understanding solution performance compared to expectations—the evaluation team used the same calculator as the administrator and implementers to evaluate the cost-effectiveness of the Focus on Energy offerings in CY 2020, presented in this section.

As directed by the PSC, the modified total resource cost (TRC) test is considered the primary test in assessing the cost-effectiveness of individual solutions and offerings and of the entire Focus on Energy portfolio.[14] The PSC also directed that four additional tests be conducted for advisory purposes: an expanded TRC that also includes net economic benefits, the utility administrator cost test (UAT), the ratepayer impact measure test (RIM), and the societal test.

NTG ratios can be a significant driver of TRC, UAT, RIM, and societal test results. NTG ratios are applied to impacts so they reflect only the gains resulting from the solutions. Therefore, NTG ratios account for the energy savings that would have been achieved without the efficiency solutions (that is, when the NTG ratio is less than 1.0, savings are removed and, when the NTG ratio is greater than 1.0, savings are added). In all cases, the energy savings are multiplied by the NTG ratio.

On the cost side, expenditures that would have occurred without the efficiency effort are also removed. These expenditures include the incremental measure costs and lost revenues, both of which are multiplied by the NTG ratio. Costs that would not have occurred in absence of the solution (such as solution and administrative costs) are not impacted by the NTG ratio.

Test Description

The evaluation team—as well as the administrator in developing its calculator—used methods adapted from the California Standard Practice Manual,[15] the conventional standard of cost-effectiveness analysis for energy efficiency programs in the United States. The modified TRC is described below, and the detailed descriptions and results for the expanded TRC, the UAT, RIM and societal test are in *Appendix H* in Volume III.

The TRC is the most commonly applied test for evaluating the cost-effectiveness of energy efficiency and renewable resource programs around the country. Applications range across states and utility

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[14] Public Service Commission of Wisconsin. June 6, 2018. *Quadrennial Planning Process III – Final Decision*. PSC Docket 5-FE-101, PSC REF#: 343909. http://apps.psc.wi.gov/vs2015/ERF_view/viewdoc.aspx?docid=343909

[15] California Public Utilities Commission. July 2002. *California Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects*. http://www.calmac.org/events/SPM_9_20_02.pdf

jurisdictions, from the standard TRC to the societal cost test, which expands the test inputs to account for a more holistic societal perspective. Modifications to the standard TRC often include reducing the discount rate or including various environmental and non-energy benefits. The test includes total participant and administrator costs, as well as some non-energy benefits such as emission reduction benefits. Note that incentive costs are not included as TRC costs because they are deemed transfer payments, which is consistent with industry guidelines defining the TRC test. Incentive costs are used for other costs tests, however, such as the UAT.

The modified TRC used for the CY 2020 evaluation defines solution cost-effectiveness from a regulatory perspective (as directed by the PSC) and is intended to measure the overall impacts of the solutions' benefits and costs on the state of Wisconsin. The test compares all benefits and costs to the state that can be measured with a high degree of confidence, including any net avoided emissions that are regulated and that have either well-defined market or commission-established values. The purpose of the modified TRC is to determine if the total costs incurred by residents, businesses, and Focus on Energy for operating the solutions are outweighed by the total benefits they receive.

In simple terms, the modified TRC benefit/cost value is the ratio of avoided utility and emission costs from avoided energy consumption to the combination of solution administrative costs, solution delivery costs, and net participant incremental measure costs:

$$TRC\,\frac{B}{C} = \frac{[Value\ of\ Gross\ Saved\ Energy + Value\ of\ Gross\ Avoided\ Emissions] * NTG}{[Adminstrative\ Costs\ +\ Delivery\ Costs + (Incremental\ Measure\ Cost\ * NTG)]}$$

Where:

$$Value\ of\ Gross\ Saved\ Energy = Gross\ Savings * Utility\ Avoided\ Costs$$

Interpreting Test Results

Because of changes in avoided electric energy and natural gas costs, changes to measure-level incremental costs, and changes to emissions allowance prices for the CY 2019 - CY 2022 quadrennium, cost-effectiveness results reported here are not directly comparable to results from the previous quadrennium (CY 2015-CY 2018). The changes to avoided costs tended to decrease the benefit/cost test results across all solutions, when compared to the avoided costs used in the previous quadrennium.

Additionally, changes in the calculation of incremental measure costs further reduce the comparability between quadrenniums, as many measures, including most custom measures, saw their measure cost calculation approach revised between CY 2018 and CY 2019. As with avoided costs, these changes often decreased the benefit/cost ratio at the portfolio level compared to the previous quadrennium. These externalities have an impact on solution and overall portfolio cost-effectiveness; however, they do not directly reflect the overall performance of the Focus on Energy solutions.

Value of Net Saved Energy

The value of energy saved, or displaced, equals the net energy saved multiplied by the utility-avoided cost of saving that energy. In the case of energy efficiency and renewable resource programs, the

avoided cost is the incremental (or marginal) cost for the additional energy and capacity the utility must generate or purchase rather than pay for the efficient measure that offsets the demand.

The PSC first established the methodology to estimate electric energy avoided costs in its June 18, 2012 Order under Docket 5-GF-191 (PSC REF#: 166932).[16] The PSC first established the methodology to estimate natural gas avoided costs in its Order of February 25, 2015, under Docket 5-FE-100 (PSC REF#: 232431).[17] The methodologies established under the aforementioned PSC Orders were maintained by the PSC in its Final Decision for the Quadrennial Planning Process III.[18]

The source for electric energy avoided costs in this CY 2020 evaluation comes from the annualized forecast avoided cost model developed by the evaluation team. This model relied on the Midcontinent Independent Transmission System Operator's locational marginal pricing for nodes in Wisconsin and on forecasts for 2019, 2024, and 2029.[19]

The source for natural gas avoided costs in this CY 2020 evaluation are based on Henry Hub price forecasts from the 2018 U.S. Energy Information Administration's *Annual Energy Outlook*.[20]

In its Final Decision of June 1, 2020, the PSC directed the Environmental Working Group (EWG) to propose to the PSC a method for calculating avoided transmission and distribution (T&D) costs to be used for the purposes of evaluating Focus on Energy (PSC REF#: 390566). The PSC established the methodology to estimate avoided electric T&D costs for the CY 2019 - CY 2022 Focus on Energy quadrennium, under PSC docket 5-FE-101 (PSC REF#: 406591), with the direction to revisit avoided T&D costs in the Quadrennial Planning Process IV. Avoided T&D costs are calculated based on a running average of costs associated with T&D infrastructure as reported to the PSC. This value is then escalated to align with projected increases in construction costs.[21]

To derive net savings, the evaluation team decreased the verified gross energy savings by the conventional attribution factor of the NTG ratio. The team then increased the net savings by a line loss

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[16] Public Service Commission of Wisconsin. June 18, 2012. *Quadrennium Planning Process II – Scope. PSC Docket 5-GF-191, PSC REF#: 166932.* http://psc.wi.gov/apps35/ERF_view/viewdoc.aspx?docid=166932

[17] Public Service Commission of Wisconsin. February 25, 2015.*Quadrennium Planning Process II – Scope. PSC Docket 5-FE-100, PSC REF#: 232431.* http://psc.wi.gov/apps35/ERF_view/viewdoc.aspx?docid=232431

[18] Public Service Commission of Wisconsin. June 6, 2018. *Quadrennial Planning Process III – Final Decision*. *PSC Docket 5-FE-101, PSC REF#: 343909.* http://apps.psc.wi.gov/vs2015/ERF_view/viewdoc.aspx?docid=343909

[19] Midcontinent Independent Transmission System Operator, Inc. Last updated 2019. "Day-Ahead Locational Marginal Pricing" https://www.misoenergy.org/markets-and-operations/real-time--market-data/market-reports/

[20] U.S. Energy Information Administration. February 6, 2018. *Annual Energy Outlook*. https://www.eia.gov/outlooks/archive/aeo18/pdf/AEO2018.pdf

[21] Public Service Commission of Wisconsin. March 10, 2021. *Quadrennial Planning Process III* . Order PSC Docket 5-FE-101, REF#: 406591. https://apps.psc.wi.gov/ERF/ERFview/viewdoc.aspx?docid=406591.

factor of 8% to account for distribution losses. Table 20 shows the avoided cost assumptions used for the cost-effectiveness tests in CY 2018, CY 2019, and CY 2020.

Table 20. Avoided Cost Comparison of CY 2018, CY 2019, and CY 2020

Avoided Cost	CY 2018	CY 2019	CY 2020
Electric Energy ($/kWh) [a]	$0.04747 to $0.06871	$0.03093–$0.04878	$0.03093–$0.05015
Electric Capacity ($/kW year)	130.26	$117.43 to 174.17	$124.75–$176.99
Natural Gas ($/therm) [b]	$0.802 to $1.278	$0.538–$0.764	$0.524–$0.777
Transmission and Distribution ($/kW year)	N/A	N/A	$66.34–$68.61
Avoided Cost Inflation	0%	0%	0%
Real Discount Rate	2%	2%	2%
Line Loss	8%	8%	8%

[a] The CY 2020 cost-effectiveness analyses used a time series that grows from $0.03093 to $0.06871 over 14 years in the forecast model.

[b] The natural gas avoided costs grow from $0.625 to $1.278 over a 25-year period based on growth rates from U.S. Energy Information Administration. May 7, 2014. *Annual Energy Outlook 2014*. https://www.eia.gov/outlooks/archive/aeo14/

Emissions Benefits

The equation to determine emissions benefits requires three key parameters—lifecycle verified net energy savings, emissions factors, and the dollar value of the displaced emissions. Emissions factors are simply the rate at which the pollutants are emitted per unit of energy and are most often expressed in tons of pollutant per energy unit—electric is expressed in tons per megawatt hour (MWh) and natural gas is expressed in tons per thousand therms (MThm).

The product of the emissions factor and the net lifecycle energy savings is the total weight of air pollutant displaced by the program. The product of the total tonnage of pollutant displaced and the dollar value of the displaced emissions per ton is the avoided emissions benefit.

The natural gas emissions factor has remained constant since CY 2011, and the U.S. Environmental Protection Agency's AVERT tool was used to calculate the electric emissions. This tool uses emissions factors specific to different regions in Wisconsin in order to get more tailored figures. Previously to obtain emissions by program, the evaluation team mapped site zip code and utilities to AVERT regions, however, the EPA updated the regions so now all of Wisconsin falls into a single region. With all savings allocated to one region the team aggregated them by solution and offering and ran them through the AVERT tool to get the electric emissions benefits.

The evaluation team obtained nitrogen oxide and sulfur dioxide emissions allowance prices from near the end of CY 2016 from the U.S. Environmental Protection Agency's *Cross State Air Pollution Rule*.[22] The team used the carbon dioxide emissions price established by the PSC in their Final Decision for Quadrennial Planning Process III (PSC Ref#: 343909), which states, "The Commission finds it reasonable

[22] S&P Global. "Platts MegaWatt Daily." Accessed April 2017. http://nyarea.org/wp-content/uploads/11_23_16_EARNED-MEDIA_Platts-Megawatt-Daily_King-Coal-to-reign-again-%E2%80%94-for-the-winter-EIA.pdf

for Focus cost-effectiveness tests to continue valuing avoided carbon dioxide emissions using a market-based value of $15.00 per ton."[23]

Table 21 lists the emissions benefits for all programs by channel.

Table 21. Total Program Emissions Benefits by Channel

Program Year [a]	Residential	Nonresidential	Midstream	Rural	Total
CY 2019 Emissions Benefits	$24,187,924	$94,615,966	N/A	$2,092,656	**$118,803,890**
CY 2020 Emissions Benefits	$25,528,397	$83,364,962	$520,240	$7,051,357	**$116,464,956**

[a] Reported emissions impacts are based on the sum of project-level benefits, both electric and gas

Program Costs

The program costs represent all costs associated with running the efficiency and renewable programs (including administration and delivery costs). The evaluation team did not include incentive costs because they are deemed as transfer payments to the customer.[24] Focus on Energy's fiscal agent, Wipfli, provided the CY 2020 solution costs used for this evaluation.

Table 22 shows the CY 2019 and CY 2020 solution and incentive cost values used for the cost-effectiveness tests.

Table 22. Sector Costs Comparison

Costs	CY 2019	CY 2020
Residential		
Incentive Costs	$23,490,150	$22,892,753
Administrative Costs	$2,775,789	$1,319,419
Delivery Costs	$10,438,711	$11,806,913
Total Residential Program Costs	**$36,704,651**	**$36,019,085**
Nonresidential		
Incentive Costs	$40,345,267	$28,976,029
Administrative Costs	$2,135,458	$1,279,291
Delivery Costs	$21,263,700	$15,956,836
Total Nonresidential Program Costs	**$63,744,426**	**$46,212,156**
Rural		
Incentive Costs	$1,875,588	$3,199,158
Administrative Costs	$27,111	$201,959
Delivery Costs	$1,388,404	$2,233,296
Total Rural Program Costs	**$3,291,103**	**$5,634,413**

[23] Public Service Commission of Wisconsin. June 6, 2018. *Quadrennial Planning Process III – Final Decision*. *PSC Docket 5-FE-101, PSC REF#: 343909.* http://apps.psc.wi.gov/vs2015/ERF_view/viewdoc.aspx?docid=343909

[24] The evaluation team included the incentives as an incremental cost but not as a program cost.

Costs	CY 2019	CY 2020
Total		
Incentive Costs	$65,711,006	$55,469,515
Administrative Costs	$4,938,358	$2,788,738
Delivery Costs	$33,090,816	$30,544,175
Total Program Costs	**$103,740,180**	**$88,802,428**

Incremental Costs

The gross incremental costs are the additional costs incurred as a result of purchasing efficient equipment over and above purchasing a baseline nonqualified product. The evaluation team derived the gross incremental cost values used in this CY 2020 evaluation from the incremental cost study it conducted with the administrator and implementers. The incremental cost study allowed the evaluation team to establish up-to-date incremental costs for all measures using the best available data, including historical Focus on Energy program data and independent research from other state programs. The gross incremental costs, similar to the energy savings used in the cost-effectiveness tests, required the application of attribution factors to account for freeridership.

As in the evaluation of the previous quadrennium (CY 2015-CY 2018), the evaluation team assigned actual CY 2020 project costs from the solution tracking databases to the renewable energy projects. Table 23 shows the CY 2019 and CY 2020 total measure net incremental costs used for the cost-effectiveness tests.

Table 23. Net Incremental Measure Cost Comparison

Costs	Residential	Nonresidential	Midstream
CY 2019 Incremental Costs	$62,647,981	$134,864,170	N/A
CY 2020 Incremental Costs	$56,215,910	$256,704,060	$2,861,262

Table 24 lists CY 2020 incentive costs by channel, with renewables incorporated.

Table 24. CY 2020 Incentive Costs by Channel (with Renewables Incorporated)

Costs	Residential	Nonresidential	Midstream	Total
Incentive Costs	$23,158,238	$31,909,700	$401,575	$55,469,515

Table 25 lists the findings of the benefit/cost analysis for Focus on Energy's CY 2020 programs by sector.

Table 25. CY 2020 Benefit and Costs Portfolio Breakout

Focus on Energy Benefits and Costs		Portfolio Breakout	Core Efficiency	Rural	Renewables
Incentives	$55,469,515		$47,677,244	$3,171,874	$4,620,397
Modified TRC Benefits	$691,541,465		$597,095,217	$40,036,111	$54,410,137
Modified TRC Costs	$284,353,558		$231,190,174	$9,450,821	$43,712,564
Portfolio TRC Ratio with T&D Benefits	**2.43**	Alone	**2.58**	**4.24**	**1.24**
		With Core		**2.65**	**2.37**
		With Core and Rural			**2.43**
		With Core and Rural and Renewables			**2.43**

Table 26 lists the findings of the benefit/cost analysis for Focus on Energy's CY 2020 programs by channel, with rural measures incorporated into each channel for each cost-effectiveness test.

Table 26. CY 2020 Costs, Benefits, and Modified Total Resource Cost Test Results by Channel

	Residential	Nonresidential	Midstream	Renewables	Total
Administrative Costs	$1,292,223	$1,422,713	$9,657	$64,144	$2,788,738
Delivery Costs	$11,563,550	$17,745,763	$525,541	$709,320	$30,544,175
Incremental Measure Costs	$47,796,116	$158,148,925	$2,118,513	$42,957,092	$251,020,645
Total TRC Costs	**$60,651,889**	**$177,317,401**	**$2,653,712**	**$43,730,556**	**$284,353,558**
Electric Benefits	$71,967,357	$274,243,541	$684,267	$46,565,622	$393,460,787
Gas Benefits	$20,599,359	$103,887,844	$2,463,121	$0	$126,950,324
Emissions Benefits	$22,299,686	$85,800,515	$520,240	$7,844,515	$116,464,956
T&D Benefits	$10,443,511	$44,043,325	$178,562	$0	$54,665,398
Total TRC Benefits	**$125,309,914**	**$507,975,225**	**$3,846,189**	**$54,410,137**	**$691,541,465**
TRC Benefits Minus Costs	**$64,658,025**	**$330,657,824**	**$1,192,478**	**$10,679,580**	**$407,187,907**
TRC Benefit/Cost Ratio without T&D Benefits[a]	**1.89**	**2.62**	**1.38**	**1.24**	**2.24**
TRC Benefit/Cost Ratio with T&D Benefits[a]	**2.07**	**2.86**	**1.45**	**1.24**	**2.43**

[a] The TRC ratio equals the total TRC benefits divided by non-incentive costs.

Table 27 lists the CY 2019 and CY 2020 portfolio cost-effectiveness results for the modified TRC by sector both with and without renewable measures, including T&D benefits for 2020.

Table 27. Cost-Effectiveness Results for Focus on Energy Portfolio

Calendar Year	Renewables Included	Residential	Nonresidential	Midstream	Renewables	Total
CY 2019	Yes	1.70	2.99	N/A	N/A	**2.58**
	No	1.79	3.11	N/A	1.51	**2.58**
CY 2020	Yes	1.70	2.78	1.45	N/A	**2.43**
	No	2.07	2.86	1.45	1.24	**2.43**

The PSC directed Focus on Energy to perform additional benefit/cost tests for informational purposes:

- The expanded TRC has the same inputs as the modified TRC, plus net economic benefits.
- The UAT measures the net benefits and costs of the programs as a resource option from the perspective of the Focus on Energy administrator.
- The RIM is the ratio of avoided utility costs and the combination of participant incentives, administrative costs, and lost utility revenue.

Table 28 lists the CY 2020 portfolio-level cost-effectiveness results for these additional test perspectives, including T&D benefits for the expanded TRC and UAT.

Table 28. CY 2020 Portfolio-Level Cost-Effectiveness Results for Additional Benefit/Cost Tests

Test	Residential	Nonresidential	Midstream	Rural	Renewables	Total
Expanded TRC						**4.32**
UAT	**3.45**	**8.68**	**3.55**	**5.91**	**8.44**	**5.86**
RIM	**0.47**	**0.94**	**1.00**			**0.77**

The inclusion of economic benefits to the expanded TRC results in higher benefit/cost ratios compared to the portfolio-level modified TRC results. For the UAT, the results show that benefits from the residential programs were more than three times the costs, while the benefits from the nonresidential programs outweighed the costs by a factor of more than eight.

As expected, the benefit/cost portfolio values from the RIM are less than one. When interpreted within the context of the UAT results, these findings indicate that, although annual Focus on Energy activities will probably induce theoretical upward pressure on future energy rates, total ratepayer energy costs will go down.

For additional details on the different benefit/cost test results and processes used for calculating the cost-effectiveness of the Focus on Energy portfolio, please refer to *Appendix H* as well as the Benefit/Cost Analysis CY 2009 Evaluation Report.[25]

[25] Focus on Energy. November 24, 2009. *Benefit/Cost Analysis CY 2009 Evaluation Report.* Submitted to Public Service Commission of Wisconsin. Submitted by PA Consulting Group and KEMA, Inc. https://focusonenergy.com/sites/default/files/bcanalysiscy09_evaluationreport.pdf

Outcomes and Recommendations

Based on the evaluation team's segment- and portfolio-level findings, this section presents high-level outcomes and recommendations.

CY 2020 Outcomes and Recommendations

The evaluation team synthesized information from all CY 2020 evaluation activities to inform the following portfolio-level outcomes and recommendations. More information on supporting findings can be found in both this report and in the Volume II program-specific chapters.

Outcome 1. The transition to the new portfolio structure in 2020 correlated with a positive customer experience, and participants are highly satisfied with Focus on Energy offerings. Overall, CY 2020 data is consistent with CY 2019, which shows a statistically significant improvement over CY 2015-CY 2018 quadrennium satisfaction ratings. Residential sector scores under the new portfolio structure were higher than in CY 2019, though several factors may be at play beyond the new portfolio structure, including the strong participation in the Packs offering, which garnered very high satisfaction. Though nonresidential scores were equivalent to CY 2019, a significant portion of nonresidential repeat participants reported an improved experience compared with prior years. Additionally, the satisfaction ratings for nearly all residential and nonresidential offerings in CY 2020 were statistically higher than the portfolio target of 8.9 out of 10, except for two offerings that were statistically equivalent to the target.[26]

Outcome 2. Though a positive experience for customers, the shift to the new portfolio structure caused data tracking challenges for the evaluation team. Specifically, when classifying new projects under solutions and offerings in the SPECTRUM database, the entry requires significant manual effort for the evaluation team, and the team found that several projects were misclassified. To address these misclassifications, the team developed a new mapping methodology that requires cumbersome filtering and complex sequences to generate accurate offering-level impact summaries. These extra data classification steps pose a risk to creating replicable results.

Recommendation 2. The evaluation team recommends that the SPECTRUM database be updated with current and accurate headings for the solution, offering, and sub-offering uniformly. If reprogramming new entry fields is not feasible in the near term, some existing entry fields could be reclassified to represent these designators as a stop gap solution. If reprogramming or reclassification of any kind is not feasible, the evaluation team recommends that the administrator discuss the filtering methodology with the evaluation team early in CY 2021 to ensure that all 2021 projects are correctly classified into the correct sub-offering for the CY 2021 evaluation and analysis activities.

[26] The team measured statistical significance using binomial *t*-tests with $p<0.10$ or better. The Appliance Recycling offering (CY 2020 rating of 8.9) and New Construction Business Prescriptive offering (CY 2020 rating of 9.0 based on 25 surveys) were statistically equivalent to the portfolio target.

Outcome 3. COVID-19 impacts on program performance varied across solutions. Residential offerings that required in-person contact responded quickly by offering contactless designs (such as curbside pick-up for Appliance Recycling and Etail events in place of Retail pop-up events), allowing for minimal impact on participation for most offerings. Indeed, online offerings—most notably Packs—saw significantly increased participation in CY 2020. Residential New Construction was the only offering to suffer notably from COVID-19, citing labor and construction material shortages as the reason for not meeting CY 2020 goals.

Despite lower participation, nonresidential solutions met their electric and gas savings goals. Most facilities and businesses remained open, which facilitated the ability to accrue energy savings.

Outcome 4. In CY 2020, the Direct to Customer implementer introduced several new MMIDs in SPECTRUM that did not go through the prescribed TRM review and approval process. In some cases, the evaluation team struggled to identify appropriate savings for these measures or understand *ex ante* assumptions, making it difficult to assign verified savings to these measures and understand measure-level realization rates.

Recommendation 3: The TRM management committee should enact regular reminders about agreed-upon steps for approving new measures or delivery channels and adding new measures to SPECTRUM. The team should also consider designing a process that allows for rapid creation of new measures in SPECTRUM before formally approving savings and costs, while still ensuring savings and costs are finalized well before the evaluation team receives final data.

Outcome 5. Several factors created discrepancies between *ex ante* and verified savings for nonresidential projects. Many of the issues cited in the CY 2019 evaluation, and corresponding recommendations, still apply to CY 2020.

CY 2019 Conclusion (Summary)	CY 2019 Recommendation (Summary)	CY 2020 Recommendation
The evaluation team and the program implementers used different versions of the TRM for calculating savings, which created inefficiencies.	Set a clear policy on which version of the TRM should be used (either the TRM in place at the time the project was paid or the latest TRM, but not both). Consider adding a data field to SPECTRUM identifying the TRM version used to calculate *ex ante* reported savings.	**Same**
Reported savings were sometimes claimed for projects that were not fully implemented. This poses a risk for achieving verified savings, particularly for large projects. In some cases, the evaluation team found that verification reports were submitted before project implementation was complete.	Ensure that verification visits (completed by the implementer) are conducted only after the project is fully implemented and commissioned to ensure incentives are paid and savings are claimed for fully installed and operating equipment.	**Same**

CY 2019 Conclusion (Summary)	CY 2019 Recommendation (Summary)	CY 2020 Recommendation
Some large and complex projects lacked detailed savings calculations, reporting, and data collection, causing discrepancies with verified savings, particularly when the evaluation team used power metering to gather data on the site.	Provide more comprehensive review and analysis of project savings for larger custom projects that could be more complex and variable. The evaluation team recommends setting a minimum requirement that involves a technical analysis summary, in which the implementer provides details about the methodologies used and assumptions made to calculate savings. The evaluation team also recommends a verification report in addition to the verification sheet, in which assumptions in the technical analysis summary 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.	**Same**

Outcome 6. Cadmus found that virtual site visits had both benefits and drawbacks. Many customers stated that virtual site visits were convenient and took less time than in-person visits. Cadmus found that many customers reviewed the data collection checklist, and this led to a shorter visit. However, there were occasional internet connectivity issues and it was difficult to verify some equipment from a distance, such as plants that installed thousands of LEDs.

Benefits of virtual site visits included the following:

- Convenient for customers
- No travel time for evaluation team members
- Shorter visit, especially if site contact was knowledgeable about the installed measure and reviewed the data collection checklist in advance

There were also a handful of drawbacks, such as these:

- Internet connectivity issues, especially in certain areas of plants such as boiler rooms
- Frequent rescheduling of visits when customers did not show up to the meeting
- Possible decrease in evaluation rigor due to not working with the equipment directly

Recommendation 6. The evaluation team recommends Focus on Energy pursue a mix of virtual and on-site verification on future evaluations, depending on the measures being investigated. Virtual site visits were found to be an effective evaluation tool for verifying savings on straightforward prescriptive type measures that do not require additional metering or spot measurements.

Outcome 7. For the Midstream offering, participating distributors are highly satisfied with and would like to see the offering expanded to include more equipment types and models.

Outcome 8. Also for Midstream, there is no current evidence that the offering is changing distributors' behavior with regard to stocking HVAC and commercial kitchen equipment. However, feedback from distributors indicates that the offering does encourage them to recommend equipment with higher levels of efficiency. It is worth noting that CY 2020 was the first year to implement the Midstream offering and changes to stocking practices tend to take several years to take effect fully, so this result is not unexpected. The data will serve as a baseline for any changes observed in future years as the program matures.

Outcome 9. Feedback with regard to the Midstream offering's impact on qualifying equipment sales was inconsistent and, in some cases, somewhat contradictory. Though most distributors estimated they would have sold roughly equivalent numbers of qualifying equipment in the absence of the offering, they also rated their participation as having a high impact on their sales of high-efficiency equipment.

Recommendation 7. Work with Midstream distributors to identify equipment categories and efficiency tiers that would most benefit from incentives to maximize the impact of the offering and minimize freeridership. For example, if most of the ductless mini-splits carried by distributors are at least 18 SEER, consider limiting incentives to only higher SEER models. To minimize freeridership, consider eliminating incentives for equipment with significant market share and shifting these resources to increase the incentive levels for equipment with higher incremental costs.

Recommendation 8. Include more detailed follow-up questions in future years to get at any apparent contradictions between program influence and distributor behaviors, focusing on stocking, incentive, or marketing practices for the Midstream offering.