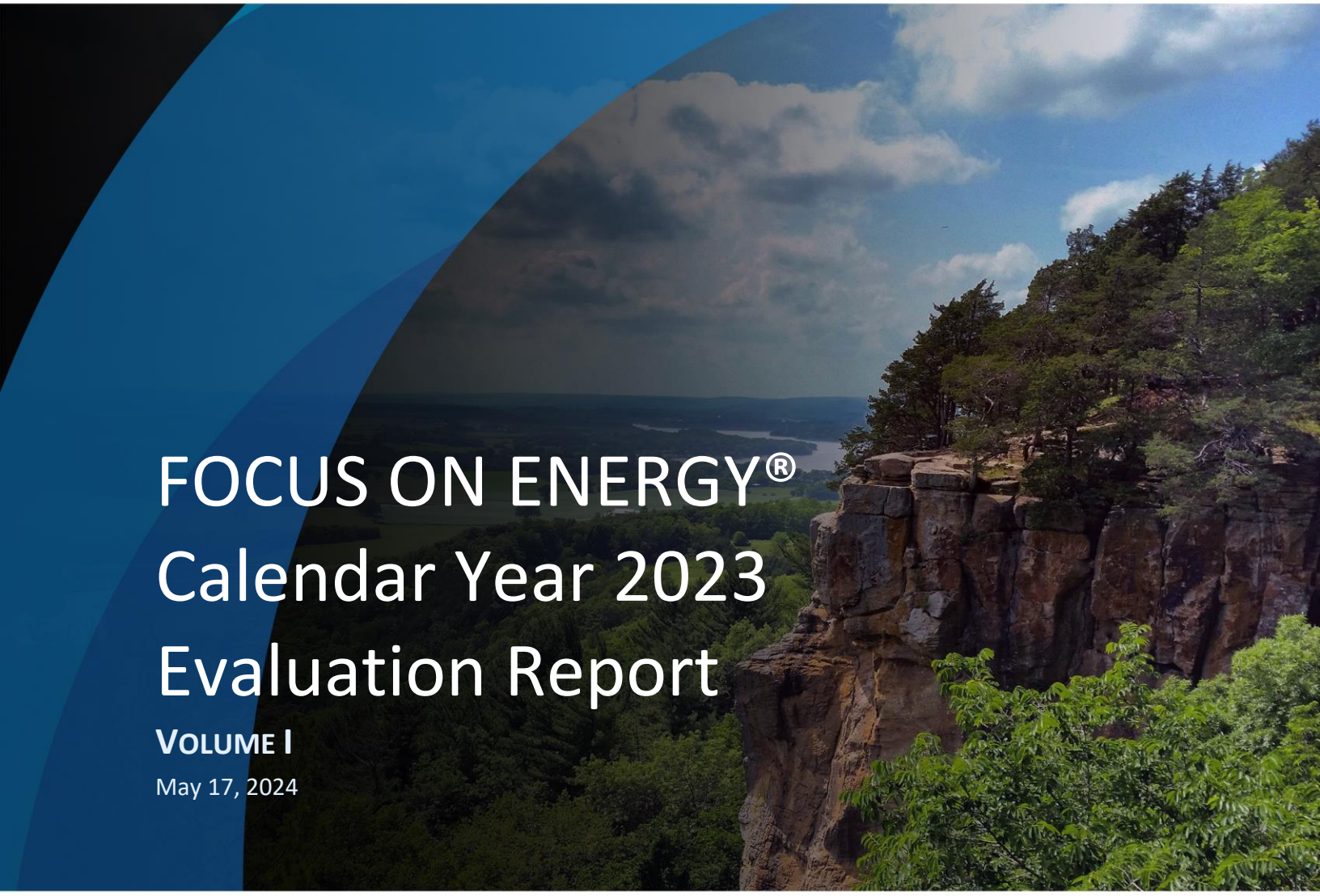
CADMUS



FOCUS ON ENERGY® Calendar Year 2023 Evaluation Report

VOLUME I

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Acronyms and Abbreviations

Acronym	Term
AVERT	AVoided Emissions and geneRation Tool
CBO	Community-Based Organization
CFM	Cubic feet per minute
CY	Calendar year
EDA/EDR	Energy Design Assistance/ Energy Design Review
EPA	Environmental Protection Agency
GWh	Gigawatt-hour
HVAC	Heating, ventilation, and air conditioning
IRA	Inflation Reduction Act
KPI	Key performance indicator
kW	Kilowatt
kWh	Kilowatt per hour
LED	Light-emitting diode
MMBtu	Million British thermal unit
MThm	Thousand therms
MWh	Megawatt per hour
NPS	Net promoter score
NTG	Net-to-gross
PSC	Public Service Commission of Wisconsin
PV	Photovoltaic
SEM	Strategic energy management
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) 2023. When appropriate, each volume includes previous evaluation results alongside CY 2023 results for comparison:

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

The Wisconsin Focus on Energy Evaluation Dashboard is another tool that 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 online Evaluation Dashboard) should be read together to gain a comprehensive perspective of the Focus on Energy portfolio.

SUMMARY OF METHODS

Each year, the evaluation team produces results for three consistent evaluation research areas—impact analysis, customer satisfaction, and cost-effectiveness—in addition to more targeted research that varies annually and is designed to meet Focus on Energy's specific program evaluation needs. Starting in Quadrennium IV, the evaluation team will also be reporting on key performance indicators (KPIs) outlined in the program administrator's contract and Public Service Commission of Wisconsin (PSC) priorities for Quadrennium IV. The five ongoing research areas of the evaluation are briefly described here. Specific annual evaluation efforts are described in the program chapters of Volume II.

Impact Analysis

The following key terms are briefly defined here and further detailed in Appendix B. Glossary of Terms in 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 the absence of the offering).

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

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

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 2023 and applied evaluation results from previous years.

Customer Satisfaction

To monitor participants' satisfaction with Focus on Energy and its programs, the evaluation team analyzed ongoing participant surveys that the administrator distributed to all participants with contact information. The team reported on various satisfaction topics, including overall satisfaction with the program and Focus on Energy as a whole, as well as a net promotor score. These analyses are further described in specific program chapters of Volume II.

Cost-Effectiveness

The evaluation team used a Focus on Energy cost-effectiveness calculator to determine the cost-effectiveness of individual programs and offerings as well as of the entire Focus on Energy portfolio. Volume I includes the results for the primary test: the modified total resource cost (TRC) test. The PSC also requires the use of three secondary tests for informational purposes. Results of all four tests conducted as part of Focus on Energy's evaluation—including the modified TRC—are provided in Appendix I. Cost-Effectiveness and Emissions Methodology and Analysis in Volume III.

Key Performance Indicators

The evaluation team reviewed tracking data and verified savings to assess the achievement of the KPIs outlined in the program administrator's contract.[3] The evaluation team collaborated with the program administrator and staff at the PSC to establish the data sources, processes, and procedures necessary for the evaluation team to assess the achievement of the contractual KPIs. Five KPIs are outlined in the administrator's contract; however, since certain KPIs concern the program's performance at particular points within the quadrennium, the evaluation team will not report on all five KPIs each year of the quadrennium. The *Key Performance Indicators Achievement* section of this report presents the five KPIs and CY 2023 KPI verification results.

Quadrennium IV Public Service Commission Priorities

In the Quadrennium IV planning process, the PSC charged Focus on Energy with making measurable progress on various transitional priorities that will prepare the program for a shift in emphasis should the Commission wish to establish new goals and measurable targets for the program in Quadrennium V. To help address the PSC's priorities, the evaluation team conducted a variety of research and analysis activities that will allow Focus on Energy to improve or expand its savings methodologies and tracking. Appendix L. Quadrennium IV Commission Priorities Progress in Volume III presents a summary of the team's CY 2023 activities.

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[3]Contractual KPIs are established in Attachment E of the Contract for Services between the Statewide Energy Efficiency and Renewables Administration and APTIM Government Solutions, LLC. Contract Number 9501-FE-128. ***PSC REF#: 457108****.*

KEY ACHIEVEMENTS

The PSC ordered that the Focus on Energy administrator track quadrennium savings with respect to verified gross lifecycle savings targets.[4] Lifecycle savings represent the savings that programs can realize through measures over their expected useful lives. The PSC set an overall gross lifecycle savings goal for Focus on Energy in the 2023-2026 quadrennium in millions of British thermal units (MMBtu). The PSC also established a quadrennium demand savings goal and 90% minimum goal thresholds for kWh and therms savings. The minimum goal thresholds were set to allow flexibility in meeting the overall MMBtu goal using both types of savings.

Table 1 lists the 2023-2026 quadrennial goals. This report presents kWh and therm savings achievement of the overall goals.

Table 1. Focus on Energy Gross Quadrennium IV Goals

UNIT	GOAL
Lifecycle MMBtu	185,692,431
Lifecycle kWh	31,676,270,000
kW	293,900
Lifecycle therms	776,085,000

Note: Lifecycle kWh and Lifecycle therms goals reflect full targets; they are not adjusted for the 90% minimum threshold.

Table 2 shows CY 2023 lifecycle reported gross savings, verified gross savings, and verified net savings for residential, nonresidential, and midstream offerings.

Table 2. CY 2023 Lifecycle Savings by Channel

SAVINGS TYPE	UNIT	RESIDENTIAL	NONRESIDENTIAL	MIDSTREAM	TOTAL
Gross	MMBtu	14,995,169	45,247,915	3,542,993	**63,786,076**
	kWh	1,247,160,445	6,206,299,662	182,706,175	**7,636,166,283**
	kW	16,987	61,047	2,430	**80,464**
	therms	107,398,572	240,720,204	29,195,995	**377,314,771**
Verified Gross	MMBtu	14,989,920	45,825,188	3,661,855	**64,476,964**
	kWh	1,226,256,941	6,036,620,993	183,236,319	**7,446,114,252**
	kW	16,974	59,004	2,432	**78,410**
	therms	108,059,315	252,282,376	30,366,531	**390,708,223**
Verified Net	MMBtu	11,134,265	38,050,832	3,529,129	**52,714,227**
	kWh	771,759,365	4,737,947,638	171,695,136	**5,681,402,139**
	kW	9,968	45,168	2,287	**57,423**
	therms	85,010,224	218,849,548	29,433,056	**333,292,828**

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

[4] *Public Service Commission of Wisconsin. November 14, 2022. Quadrennial Planning Process IV – Final Decision. PSC Docket 5-FE-104, PSC REF#:453081.* ***https://apps.psc.wi.gov/ERF/ERFview/viewdoc.aspx?docid=45308****.*

Table 3 lists verified gross lifecycle savings achieved in CY 2022 and CY 2023.

Table 3. CY 2022 and CY 2023 Verified Gross Lifecycle Savings by Channel

CALENDAR YEAR	UNIT	RESIDENTIAL	NONRESIDENTIAL	MIDSTREAM	TOTAL
CY 2022	MMBtu	17,262,796	34,742,821	639,978	**52,645,595**
	kWh	2,483,080,424	5,444,218,647	38,776,105	**7,966,075,175**
	kW	31,133	51,148	455	**82,736**
	therms	87,905,255	161,671,468	5,076,743	**254,653,466**
CY 2023	MMBtu	14,989,920	45,825,188	3,661,855	**64,476,964**
	kWh	1,226,256,941	6,036,620,993	183,236,319	**7,446,114,252**
	kW	16,974	59,004	2,432	**78,410**
	therms	108,059,315	252,282,376	30,366,531	**390,708,223**

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

Figure 1 shows achievement toward the 2023-2026 quadrennium savings goals. Focus on Energy achieved 35% of the MMBtu savings goal, 24% of the electric energy savings goal, 27% of the electric demand reduction goal, and 50% of the natural gas savings goal.

Figure 1. Achievement of Four-Year (CY 2023-CY 2026) Verified Gross Lifecycle Savings Goals

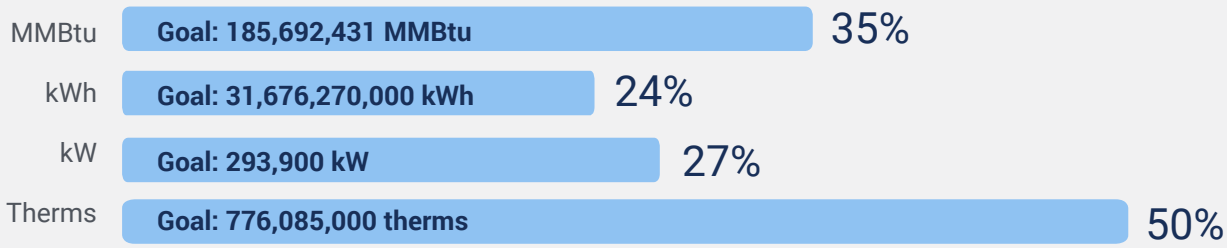


Table 4 lists CY 2023 annual reported gross savings, verified gross savings, and verified net savings for residential, nonresidential, and midstream offerings.

Table 4. CY 2023 First-Year Annual Savings by Channel

SAVINGS TYPE	UNIT	RESIDENTIAL	NONRESIDENTIAL	MIDSTREAM	TOTAL
Gross	MMBtu	817,641	2,819,429	376,512	**4,013,582**
	kWh	62,790,084	371,692,786	32,620,351	**467,103,221**
	kW	16,987	61,047	2,430	**80,464**
	therms	6,034,008	15,512,131	2,652,114	**24,198,253**
Verified Gross	MMBtu	831,045	2,864,472	376,540	**4,072,056**
	kWh	63,502,586	362,363,073	32,628,409	**458,494,068**
	kW	16,974	59,004	2,432	**78,410**
	therms	6,143,744	16,280,888	2,652,114	**25,076,746**
Verified Net	MMBtu	625,585	2,404,259	365,435	**3,395,279**
	kWh	42,182,190	290,177,057	31,531,226	**363,890,472**
	kW	9,968	45,168	2,287	**57,423**
	therms	4,816,595	14,141,745	2,578,507	**21,536,847**

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

Table 5 lists the annual verified net savings achieved in CY 2022 and CY 2023.

Table 5. CY 2022 and CY 2023 First-Year Annual Verified Net Savings by Channel

CALENDAR YEAR	UNIT	RESIDENTIAL	NONRESIDENTIAL	MIDSTREAM	TOTAL
CY 2022	MMBtu	898,311	1,760,853	28,640	**2,687,805**
	kWh	134,552,827	274,220,682	1,782,568	**410,556,078**
	kW	14,074	38,530	270	**52,873**
	therms	4,392,171	8,252,121	225,580	**12,869,872**
CY 2023	MMBtu	625,585	2,404,259	365,435	**3,395,279**
	kWh	42,182,190	290,177,057	31,531,226	**363,890,472**
	kW	9,968	45,168	2,287	**57,423**
	therms	4,816,595	14,141,745	2,578,507	**21,536,847**

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

CY 2023 net residential savings include additional market effect savings that account for the program's long-term effect on the Wisconsin residential new construction and lighting markets. Additional details can be found in the Market Effects for Non-Program Homes section of the Residential New Construction chapter and the 2023 Upstream Lighting Market Effects section of the Direct to Customer chapter, both within Volume II.

The administrator has a goal to ensure that the portfolio passes a benefit/cost analysis, specifically the modified TRC test. Table 6 lists findings from the evaluation team's benefit/cost analysis of the CY 2023 portfolio. The residential and nonresidential channels and overall portfolio were cost-effective.

Table 6. CY 2023 Cost-Effectiveness Results

FOCUS ON ENERGY BENEFITS AND COSTS	FULL PORTFOLIO	CORE PROGRAMS ALONE	RENEWABLES ALONE
Incentives	$55,107,604	$49,209,627	$5,897,976
Modified TRC Benefits ($ millions)	$611,150,870	$499,518,470	$111,632,400
Modified TRC Costs ($ millions)	$281,870,910	$189,961,124	$91,909,786
Portfolio Modified TRC Ratio	**2.17**	**2.63**	**1.21**

2. 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 administer the calendar year (CY) 2023-2026 quadrennium. The administrator, in collaboration with the implementers, is responsible for designing all Focus on Energy programs and for the overall performance of these programs 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 Statewide Energy Efficiency and Renewable Administration and to the PSC.

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 contracting with the administrator.

In CY 2023, Focus on Energy maintained three separate program delivery channels:

- The **residential channel** serves single-family, multifamily units, and multifamily buildings.
- The **nonresidential channel** commercial, industrial, school, government, and agribusiness customers.
- The **midstream channel** serves residential and nonresidential customers via distributors of eligible equipment.

2.1. CY 2023 Evaluation

The evaluation team investigated the performance of 11 programs and 23 offerings that delivered energy savings during CY 2023.[5] Table 7 lists the programs and offerings evaluated in the residential and nonresidential sectors in CY 2023.

[5] The independent evaluation team comprises Cadmus and Apex Analytics.

Table 7. CY 2023 Residential and Nonresidential Programs and Offerings

Sector	Program	Offering
Residential	Direct to Customer	Online Marketplace Packs Retail
	Renewable Rewards	Residential Renewable Rewards Affordable Housing Solar Photovoltaics (PV) Pilot
	Residential New Construction	Residential New Construction
	Trade Ally Solutions	Heating and Cooling Insulation and Air Sealing Tribal
	Multifamily	Multifamily Strategic Energy Management Energy Design Assistance/Energy Design Review
Cross-Cutting	Midstream	Midstream Contractor Community-Based Organization Distribution
Nonresidential	Agribusiness	Agribusiness
	Business and Industry	Commercial and Industrial Energy Design Assistance/Energy Design Review
	Large Industrial	Large Industrial Energy Design Assistance/Energy Design Review
	Renewable Rewards	Business Renewable Rewards
	Schools and Government	Government Schools Energy Design Assistance/Energy Design Review
	Pilots	Virtual Commissioning

2.2. Summary of Measures by Channel

The evaluation team assessed the electric and natural gas savings achieved by each measure installed in CY 2023 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 program's performance.

Table 8 lists all measure categories in the residential, nonresidential, and midstream programs.

Table 8. CY 2023 Residential, Nonresidential, and Midstream Measure Categories

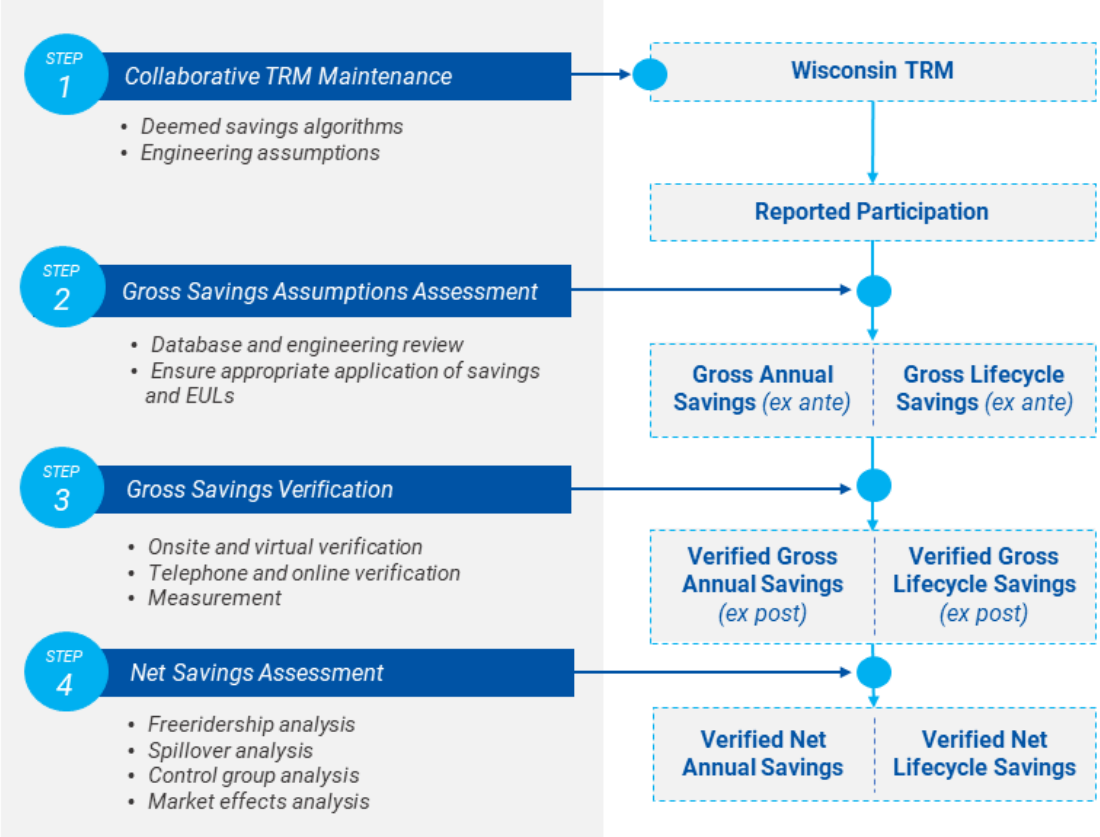
Measure Categories	
Residential Only	
Domestic Hot Water - Aeration	HVAC - Tune-up/Repair/Commissioning
Domestic Hot Water - Insulation	Motors & Drives - Motor
Domestic Hot Water - Showerhead	Vending & Plug Loads - Controls
HVAC - Air Conditioner - Residential	Vending & Plug Loads - Filtration
Residential and Nonresidential	
Boilers & Burners - Boiler	HVAC - Furnace
Boilers & Burners - Tune-up/Repair/Commissioning	HVAC - Packaged Terminal Unit (PTAC, PTHP)
Building Shell - Air Sealing	HVAC - Steam Trap
Building Shell – Insulation	New Construction - Whole Building

Measure Categories	
Domestic Hot Water - Other	Renewable Energy - Photovoltaics
HVAC - Controls	
Nonresidential Only	
Agriculture - Dryer	HVAC - Scheduling
Agriculture - Fan	HVAC - Unit Heater
Agriculture - Grain Dryer	Industrial Ovens and Furnaces - Other
Agriculture - Greenhouse	Information Technology - Supporting Equipment
Agriculture - Heat Exchanger	Laundry - Clothes Washer
Agriculture - Irrigation	Laundry - Other
Agriculture - Livestock Waterer	Lighting - Controls
Agriculture - Tune-up/Repair/Commissioning	Lighting - Delamping
Agriculture - Variable Speed Drive	Lighting - Other
Agriculture - Water Heater	Lighting - Reconfigure Equipment
Boilers & Burners - Controls	Motors & Drives - Other
Boilers & Burners - Energy Recovery	Motors & Drives - Variable Speed Drive
Boilers & Burners - Insulation	Pools - Other
Boilers & Burners - Variable Speed Drive	Process - Energy Recovery
Building Shell - Other	Process - Filtration
Compressed Air, Vacuum Pumps - Compressor	Process - Other
Compressed Air, Vacuum Pumps - Controls	Process - Pump
Compressed Air, Vacuum Pumps - Dryer	Process - Specialty Pulp & Paper
Compressed Air, Vacuum Pumps - Energy Recovery	Process - Variable Speed Drive
Compressed Air, Vacuum Pumps - Filtration	Process - Welder
Compressed Air, Vacuum Pumps - Other	Refrigeration - Controls
Compressed Air, Vacuum Pumps - Reconfigure Equipment	Refrigeration - Energy Recovery
Compressed Air, Vacuum Pumps - System Isolation	Refrigeration - Heat Exchanger
Compressed Air, Vacuum Pumps - Tune-up/Repair/Commissioning	Refrigeration - Motor
Domestic Hot Water - Energy Recovery	Refrigeration - Other
Food Service - Controls	Refrigeration - Reconfigure Equipment
Food Service - Other	Refrigeration - Refrigerated Case Door
HVAC - Chiller	Refrigeration - Refrigerator/Freezer - Industrial
HVAC - Direct Fired Heating	Refrigeration - Tune-up/Repair/Commissioning
HVAC - Energy Recovery	Renewable Energy - Biomass Combustion
HVAC - Fan	Renewable Energy - Other
HVAC - Filtration	Training & Special - Other
HVAC - Infrared Heater	Waste Water Treatment - Aeration
HVAC - Motor	Waste Water Treatment - Other
HVAC - Rooftop Unit/Split System AC	Waste Water Treatment - Study
Nonresidential and Midstream	
HVAC - Variable Speed Drive	
Midstream Only	
Food Service - Dishwasher, Commercial	Food Service - Refrigerator/Freezer - Commercial
Food Service - Fryer	Food Service - Steamer
Food Service - Hot Holding Cabinet	Refrigeration - Ice Machine
Food Service - Oven	
Residential, Nonresidential, and Midstream	
Domestic Hot Water - Water Heater	Lighting - Light Emitting Diode (LED)
HVAC - Other	Other - Bonus

2.3. Overview of Evaluation Activities

Figure 2 depicts the four-step process the evaluation team used to conduct the CY 2023 evaluation. This process is further explained below.

Figure 2. Evaluation Steps to Determine CY 2023 Gross and Net Savings



Step 1. Collaborative Technical Reference Manual (TRM) Maintenance. The evaluation team collaborated with the PSC and key Focus on Energy stakeholders to ensure that the programs' deemed savings, algorithms, and input assumptions were appropriate. Specific activities included developing measure-specific work papers and updating the Wisconsin Focus on Energy TRM.

Step 2. Gross Savings Assumptions Assessment. The evaluation team reviewed the implementation database to check for entry errors, inconsistencies, ineligible equipment, and any other possible errors. The 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. Gross Savings Verification. 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 team also recalculated or measured the actual performance of installed measures, particularly for hybrid and custom projects. The team applied the data collection and analysis methods appropriate for the specific programs, offerings, and installed measures. This process produced the *ex post* gross annual and lifecycle savings.

Step 4. Net Savings Assessment. The evaluation team estimated net-to-gross (NTG) ratios that represent the proportion of gross savings directly attributable to the influence of the programs. In deriving these ratios, the 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 the 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 program had recorded savings).

The evaluation team applied NTG ratios to the *ex post* gross savings from Step 3 to determine verified net savings.

Table 9 lists the specific data collection activities and sample sizes used in the residential, midstream, and nonresidential channels for the CY 2023 evaluation.

Table 9. CY 2023 Evaluation Activities and Sample Sizes by Channel

Evaluation Activity	Residential	Nonresidential	Midstream	Total CY 2023
On-Site and Virtual Site Visits Evaluation, Measurement, and Verification[a]	20	154	0	**174**
Engineering Desk Reviews	92	283	0	**375**
Participant Surveys and Interviews	1,112	312	0	**1,424**
Ongoing Participant Satisfaction Surveys[b]	3,844	213	0	**4,057**
Trade Ally/Market Actor Interviews	19	57	14	**90**
Contractor Surveys	147	0	21	**168**
Regression Modeling/Billing Analyses	0	20	0	**20**
System Energy Monitoring Data Collection	0	22	0	**22**

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

[b] This row includes only the 17% sample from all Direct to Customer Packs ongoing participant satisfaction survey responses that were analyzed for the CY 2023 evaluation.

3. Evaluation Findings

Table 10 lists the overall verified gross lifecycle electricity savings, demand reduction, and natural gas savings for the portfolio in CY 2022 and CY 2023.

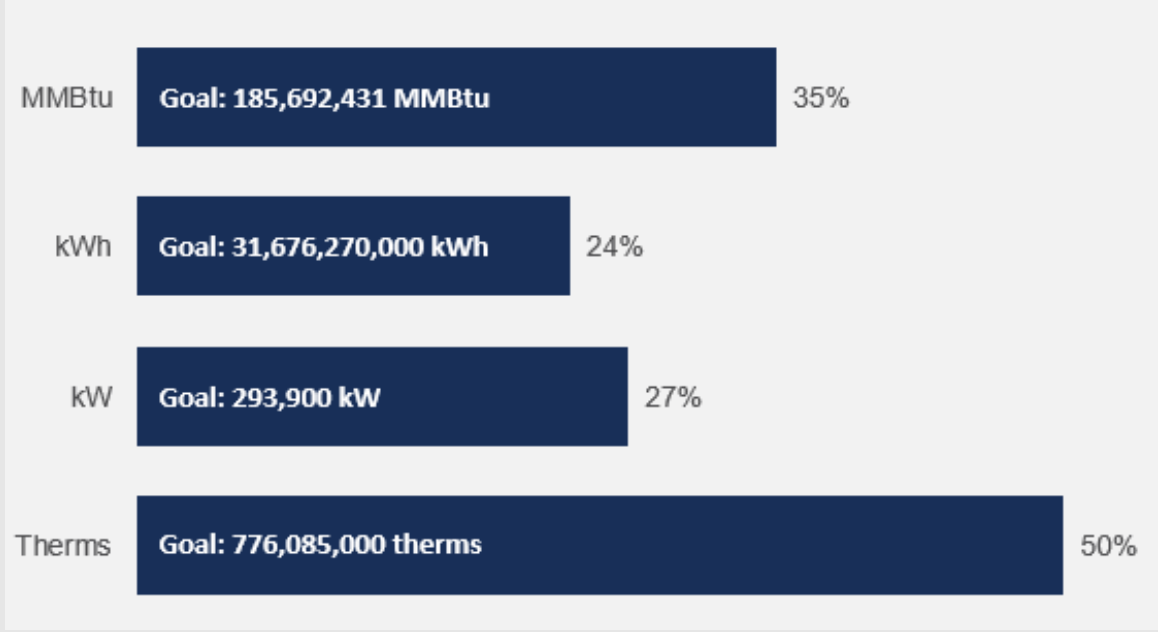
Table 10. Overall Portfolio Verified Gross Lifecycle Savings by Calendar Year

Calendar Year	Overall Savings (MMBtu)	Electric Savings (kWh)	Demand Reduction (kW)	Natural Gas Savings (therms)
CY 2022	52,645,595	7,966,075,175	82,736	254,653,466
CY 2023	64,476,964	7,446,114,252	78,410	390,708,223

As outlined under *Key Achievements* above, The PSC has ordered that the Focus on Energy administrator track quadrennium savings goals compared to verified gross lifecycle savings targets. In CY 2023, the administrator reached 35% of the MMBtu savings goal, 24% of the electric energy savings goal, 27% of the demand reduction goal, and 50% of the natural gas savings goal.

Figure 3 shows the actual quadrennium savings totals compared to the administrator's quadrennium savings goals.

Figure 3. Achievement of Four-Year (CY 2023-CY 2026) Verified Gross Lifecycle Savings Goals

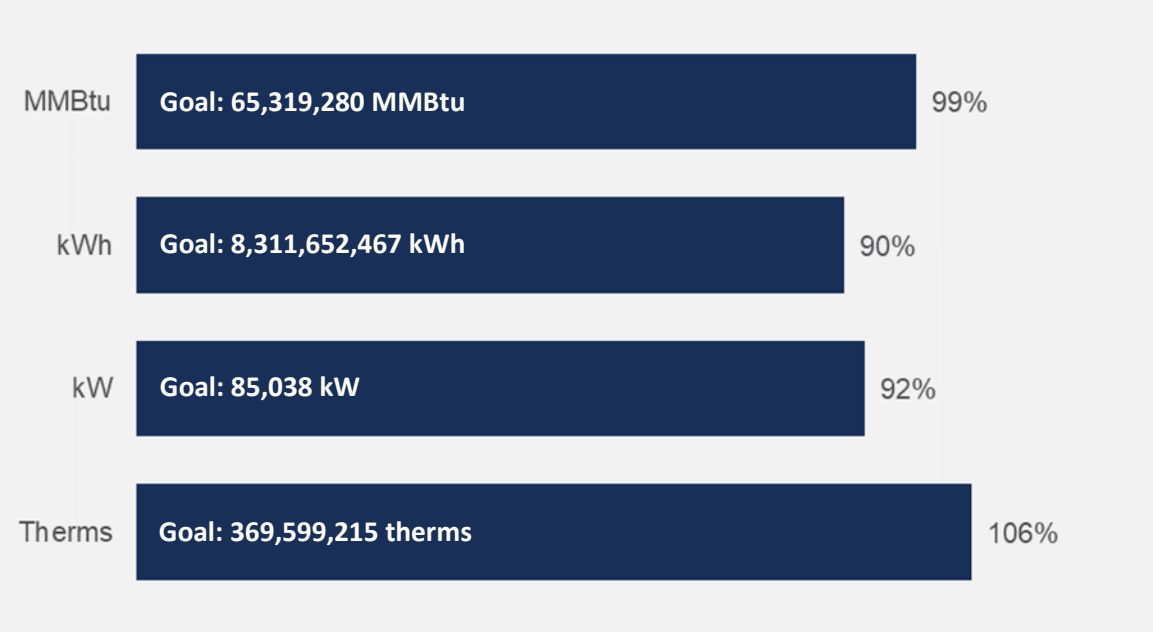


Note: Percentages represent achievements to date (CY 2023) of the administrator's established overall verified gross lifecycle goals for the quadrennium.

The administrator also sets its own interim annual verified gross lifecycle targets as it tracks toward the overall CY 2023-2026 quadrennium savings goals. In CY 2023, these targets represented 319,280 MMBtu, 8,311,652 kWh, 85,038 kW, and 369,599,215 therms.

The administrator reached 99% of the CY 2023 MMBtu savings goal, 90% of the electric energy savings goal, 92% of the electric demand reduction goal, and 106% of the natural gas verified gross lifecycle savings goal. Figure 4 shows the CY 2023 actual savings totals compared to the administrator's CY 2023 savings goals.

Figure 4. Achievement of CY 2023 Verified Gross Lifecycle Savings Goals



Note: Percentages represent achievements of the administrator's verified gross lifecycle goals for CY 2023.

Table 11 lists the overall net lifecycle MMBtu, electricity, demand, and natural gas savings for Focus on Energy's portfolio in CY 2022 and CY 2023.

Table 11. Overall Portfolio Net Lifecycle Savings by Calendar Year

Calendar Year	Overall Savings (MMBtu)	Electric Savings (kWh)	Demand Reduction (kW)	Natural Gas Savings (therms)
CY 2022	38,043,160	5,622,148,576	52,873	188,603,893
CY 2023	52,714,227	5,681,402,139	57,423	333,292,828

The PSC Final Decision for Quadrennial Planning Process IV (PSC Ref#:453081) set four-year net lifecycle savings goals for the PSC at 70% of the gross lifecycle goals. Following the gross savings goal structure, 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 allow flexibility in offering delivery in the changing markets.

The 2023-2026 net quadrennial goals are listed in Table 12. These goals represent 70% of the gross quadrennial goals listed in Table 1.

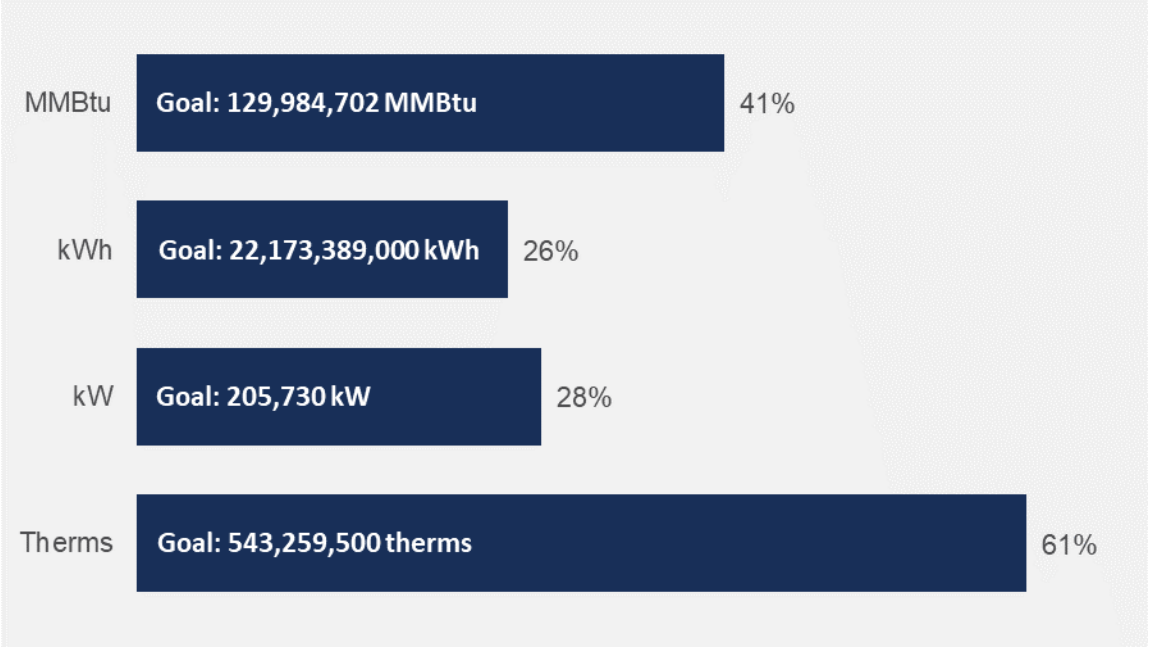
Table 12. Focus on Energy Net Quadrennium IV Goals

Unit	Net Goal
Lifecycle MMBtu	129,984,702
Lifecycle kWh	22,173,389,000
kW	205,730
Lifecycle therms	543,259,500

Lifecycle kWh and Lifecycle therms goals reflect full targets; they are not adjusted for the 90% minimum threshold.

Figure 5 compares Focus on Energy's actual quadrennium verified net savings to the PSC's established verified net savings goals for the full four-year quadrennium. The Focus on Energy offerings reached 41% of the MMBtu net savings goal, 26% of the electric energy net savings goal, 28% of the electric net demand reduction goal, and 61% of the natural gas quadrennium net savings goal to date.

Figure 5. Achievement of Four-Year (CY 2023-CY 2026) Net Lifecycle Savings Goals



Note: Percentages represent achievement to date (CY 2023) of PSC's established overall net lifecycle goals for the quadrennium.

3.1. Summary of Impacts by Offering

This section summarizes the CY 2023 savings and participation for each offering in the Focus on Energy portfolio. Volume II details the savings for each offering and the approaches the team used to calculate them. 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 13 lists the total CY 2023 participation (measured as the number of participating customers) in each offering and channel.

Table 13. CY 2023 Total Participation by Offering

Channel	Program	Offering	CY 2023 Participation
Residential	Direct to Customer	Online Marketplace	9,596
		Packs	96,953
		Retail[a]	15,620
	Renewable Rewards	Residential Renewable Rewards	2,929
		Affordable Housing Solar Photovoltaic (PV) Pilot	13
	Residential New Construction	Residential New Construction	2,146
	Trade Ally Solutions	Heating and Cooling	26,934
		Insulation and Air Sealing	2,372
		Tribal	64
	Multifamily	Multifamily	721
		Strategic Energy Management	4
		Energy Design Assistance/Energy Design Review	52
Residential Subtotal			**157,404**
Midstream	Midstream	Midstream Contractor, Commercial	55
		Midstream Contractor, Schools and Government	41
		Midstream Contractor, Residential	5,915
		Community-Based Organization (CBO) Distribution	183,280[b]
Midstream Subtotal			**189,291**

Channel	Program	Offering	CY 2023 Participation
Nonresidential	Agribusiness	Agribusiness	833
		Farmhouse Kits	641
	Business and Industry	Commercial and Industrial	1,440
		Energy Design Assistance/Energy Design Review	51
	Large Industrial	Large Industrial	246
		Energy Design Assistance/Energy Design Review	6
	Renewable Rewards	Business Renewable Rewards	243
	Schools and Government	Government	189
		Schools	234
		Energy Design Assistance/Energy Design Review	40
Nonresidential Subtotal			**3,923**
Total			**350,618**

[a] In CY 2023, all 15,620 Retail participants were carry-over from the CY 2022 upstream lighting/retail offering. Of the CY 2023 Retail offering participants, 320 were not retail lighting or income-qualified lighting participants.

[b] The Midstream CBO Distribution offering targeted residential customers; however, the evaluation team cannot confidently determine whether measures were delivered to residential or nonresidential customers.

Figure 6 shows verified gross lifecycle savings by channel.

Figure 6. CY 2023 Verified Gross Lifecycle Savings Impacts by Channel

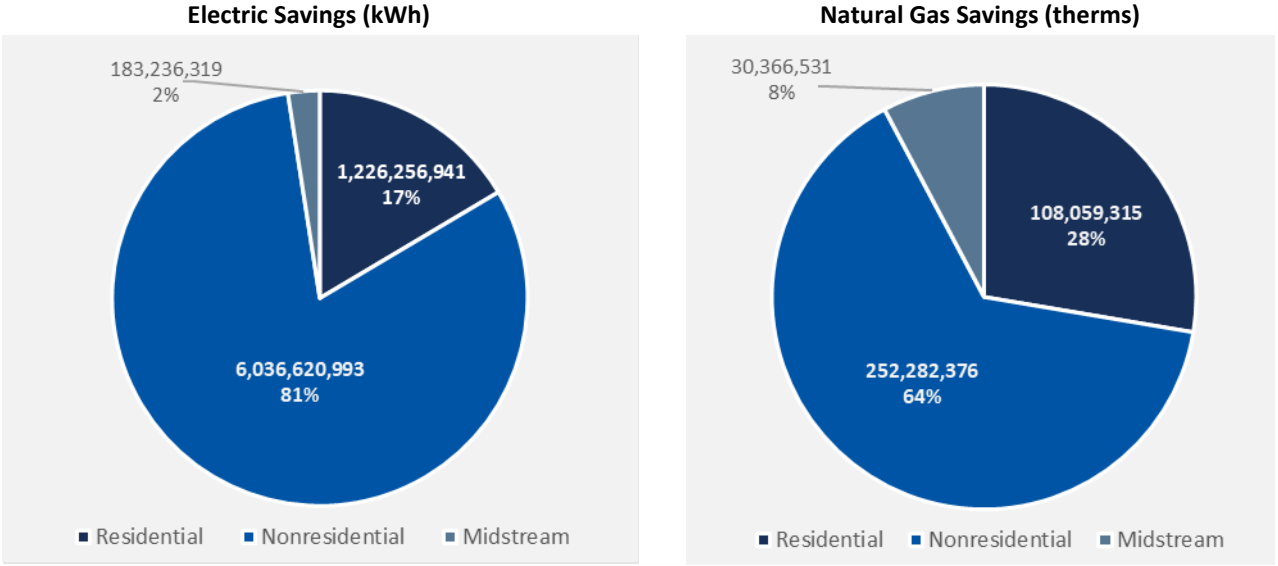


Figure 7 and Figure 8 show the percentage of lifecycle electric and natural gas savings that each offering contributes to the residential and nonresidential channels. The residential Heating and Cooling offering shows a negative contribution to the residential portfolio's lifecycle electric savings because of the substantial negative kWh impact attributed to the increased participation of customers installing air-source heat pumps that replace gas heating systems. See the Trade Ally Solutions chapter in Volume II for more details.

Figure 7. CY 2023 Verified Gross Lifecycle Electric Energy Impacts by Offering

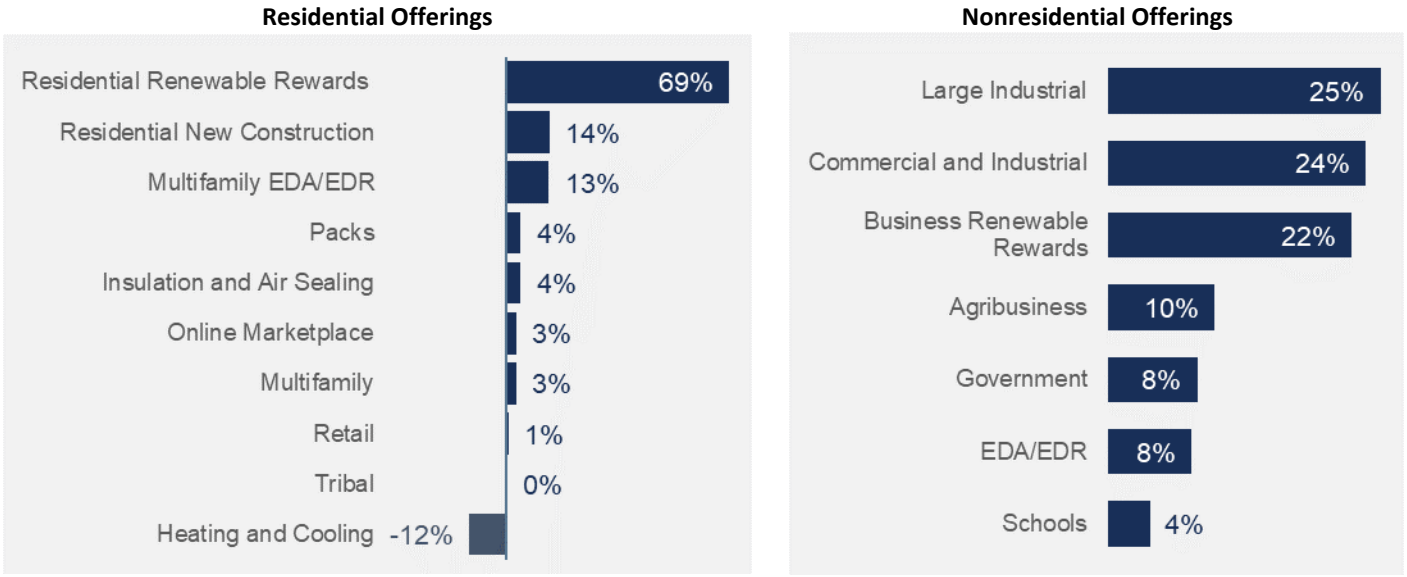


Figure 8. CY 2023 Verified Gross Lifecycle Natural Gas Energy Impacts by Offering

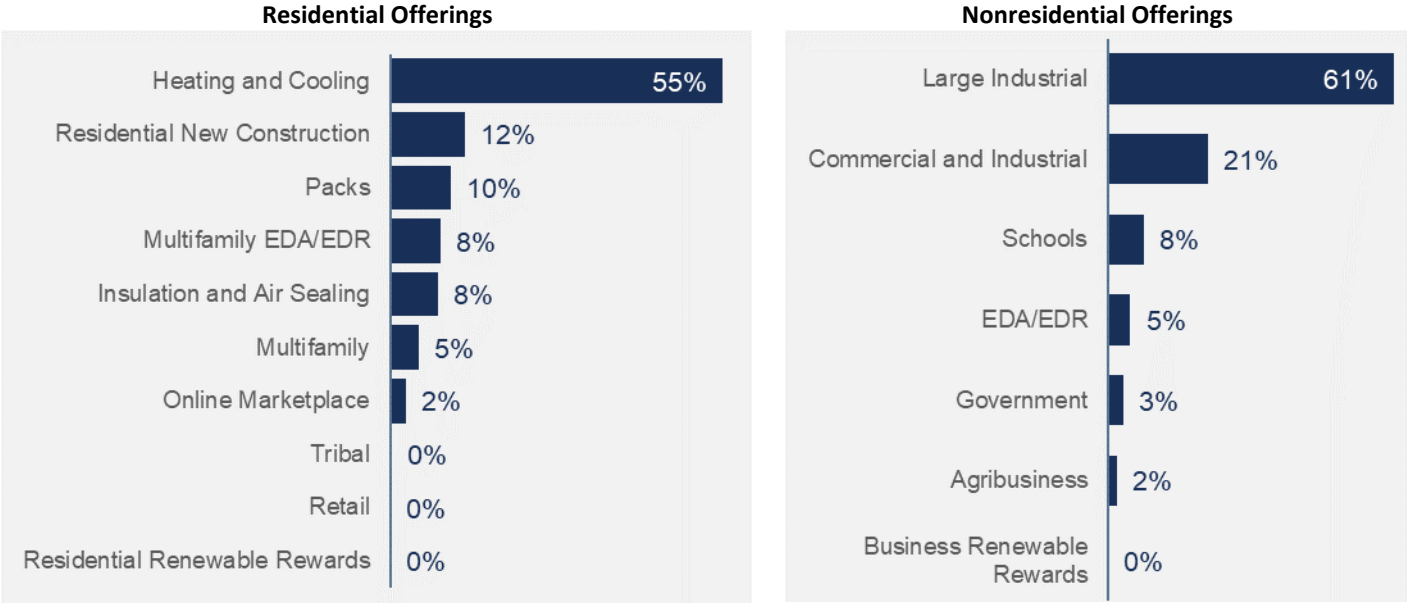


Table 14 lists the first-year annual gross savings, verified gross savings, and verified net demand reduction for electricity and natural gas by offering, channel, and overall portfolio.

Table 14. Summary of CY 2023 Annual Savings by Offering

Program Name	Offering Name	Gross			Verified Gross			Verified Net		
		kWh	kW	therms	kWh	kW	therms	kWh	kW	therms
Residential Programs										
Direct to Customer	Online Marketplace	4,008,447	43	264,598	4,227,395	46	290,168	3,625,205	39	248,430
	Packs	9,654,606	900	1,533,438	9,613,011	905	1,334,079	8,726,499	829	1,128,025
	Retail	3,422,402	379	3,149	3,420,775	379	3,149	1,722,532	181	913
Multifamily	Multifamily	2,224,233	180	204,100	2,224,233	180	204,100	1,846,113	149	169,403
	Energy Design Assistance/ Energy Design Review	8,197,034	1,260	471,494	8,115,064	1,247	443,204	7,547,009	1,160	412,180
Renewable Rewards	Residential Renewable Rewards	34,052,735	11,619	0	34,052,735	11,621	0	14,564,001	4,968	0
Residential New Construction	Residential New Construction	5,533,251	1,092	443,000	5,533,251	1,092	443,000	6,664,350	1,298	503,835
Trade Ally Solutions	Heating and Cooling	-6,429,464	510	2,767,710	-5,807,906	500	3,083,098	-4,643,369	339	2,011,375
	Insulation and Air Sealing	2,125,206	1,000	334,257	2,125,206	1,000	334,257	2,125,206	1,000	334,257
	Tribal	1,635	4	12,263	-1,176	4	8,689	4,643	5	8,177
Residential Total		**62,790,084**	**16,987**	**6,034,008**	**63,502,586**	**16,974**	**6,143,744**	**42,182,190**	**9,968**	**4,816,595**
Midstream Program										
Midstream	Midstream Contractor	2,228,279	290	163,266	2,236,337	293	163,266	1,139,154	148	89,659
	Community-Based Organization Distribution	30,392,072	2,140	2,488,848	30,392,072	2,140	2,488,848	30,392,072	2,140	2,488,848
Midstream Total		**32,620,351**	**2,430**	**2,652,114**	**32,628,409**	**2,432**	**2,652,114**	**31,531,226**	**2,287**	**2,578,507**

Program Name	Offering Name	Gross			Verified Gross			Verified Net		
		kWh	kW	therms	kWh	kW	therms	kWh	kW	therms
Nonresidential Programs										
Agribusiness	Agribusiness	36,425,541	4,622	282,326	36,441,554	4,623	293,620	28,434,192	3,607	229,023
Business and Industry	Commercial and Industrial	97,910,374	14,111	3,358,453	97,910,374	14,111	3,358,453	77,349,196	11,148	2,653,178
	Energy Design Assistance/ Energy Design Review	14,136,276	2,655	200,130	13,853,550	2,655	212,138	12,883,802	2,469	197,288
Large Industrial	Large Industrial	114,983,619	14,183	9,526,860	105,784,930	12,198	10,289,009	97,322,135	11,222	9,465,889
	Energy Design Assistance/ Energy Design Review	1,332,211	272	72,476	1,332,211	272	72,476	1,238,956	253	67,403
Renewable Rewards	Commercial Renewable Rewards	53,835,368	17,968	0	53,819,217	17,968	0	33,458,052	11,170	0
Schools and Government	Government	28,973,106	3,384	403,519	28,973,106	3,384	403,519	20,570,905	2,403	286,498
	Schools	16,504,282	2,866	1,334,500	16,504,282	2,866	1,334,500	11,718,040	2,035	947,495
	Energy Design Assistance/ Energy Design Review	7,592,008	985	333,867	7,743,848	926	317,174	7,201,779	861	294,971
Nonresidential Total		**371,692,786**	**61,047**	**15,512,131**	**362,363,073**	**59,004**	**16,280,888**	**290,177,057**	**45,168**	**14,141,745**
Total All Offerings		**467,103,221**	**80,464**	**24,198,253**	**458,494,068**	**78,410**	**25,076,746**	**363,890,472**	**57,423**	**21,536,847**

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

3.2. Summary of Impacts by Measure Category

Table 15 lists energy savings, demand reduction, and incentive costs for the top ten highest-saving residential measure categories in CY 2023, based on lifecycle MMBtu savings. See Appendix E. Detailed Findings in Volume III for a full list of all residential measure categories and their associated CY 2023 savings.

Table 15. Summary of CY 2023 Annual Savings by Measure Category in the Residential Channel

Measure Category	Verified Gross						Incentive Dollars	Incentive Dollars %
	kWh	kWh %	kW	kW %	therms	therms %		
Other-Other[a]	8,286,105	13.05%	757	4.46%	1,264,016	20.57%	$3,733,531	16.48%
New Construction-Whole Building	13,648,315	21.49%	2,339	13.78%	886,204	14.42%	$3,648,306	16.10%
Renewable Energy-Photovoltaics	34,052,734	53.62%	11,621	68.47%	0	0.00%	$3,343,412	14.76%
HVAC-Other[b]	-12,702,046	-20.00%	554	3.26%	1,595,796	25.97%	$3,228,952	14.25%
HVAC-Furnace	2,279,639	3.59%	0	0.00%	1,045,737	17.02%	$2,411,050	10.64%
Building Shell-Insulation	2,492,753	3.93%	1,073	6.32%	414,493	6.75%	$1,839,855	8.12%
HVAC-Controls	9,371,357	14.76%	0	0.00%	573,351	9.33%	$977,700	4.32%
Boilers & Burners-Boiler	0	0.00%	0	0.00%	217,328	3.54%	$382,801	1.69%
Lighting-Light Emitting Diode (LED)	4,830,042	7.61%	488	2.88%	0	0.00%	$213,373	0.94%
Domestic Hot Water-Aeration	266,881	0.42%	15	0.09%	41,013	0.67%	$32,634	0.14%

[a] Other-Other in the residential channel includes bundled packs in the Packs offering and Multifamily strategic energy management (SEM) operational savings.

[b] HVAC-Other in the residential channel includes ductless mini-split heat pumps, ground-source heat pumps, and air-source heat pumps.

Table 16 lists the 10 highest-saving nonresidential measure categories in CY 2023, based on lifecycle MMBtu savings.

Table 16. Summary of CY 2023 Annual Savings by Measure Category in the Nonresidential Channel

Measure Category	Verified Gross						Incentive Dollars	Incentive Dollars %
	kWh	kWh %	kW	kW %	therms	therms %		
Light Emitting Diode (LED)	117,024,752	32.29%	15,765	26.72%	0	0.00%	$5,805,963	20.08%
Other[a]	30,874,185	8.52%	3,501	5.93%	6,140,068	37.71%	$4,764,167	16.48%
Photovoltaics	53,819,217	14.85%	17,968	30.45%	0	0.00%	$2,553,926	8.83%
Whole Building	22,929,610	6.33%	3,853	6.53%	601,787	3.70%	$2,381,342	8.24%
Boiler	0	0.00%	0	0.00%	1,305,499	8.02%	$1,979,378	6.85%
Energy Recovery	-74,147	-0.02%	57	0.10%	2,571,958	15.80%	$1,936,270	6.70%
Variable Speed Drive	67,286,900	18.57%	8,547	14.48%	0	0.00%	$1,682,913	5.82%
Refrigerated Case Door	9,129,004	2.52%	1,631	2.76%	973,032	5.98%	$762,940	2.64%
Controls	6,062,505	1.67%	482	0.82%	787,570	4.84%	$691,254	2.39%
Filtration	-739,492	-0.20%	-142	-0.24%	1,044,287	6.41%	$689,465	2.38%

[a] Other in the Nonresidential Channel encompasses a wide variety of measures, such as unspecified process improvements, unspecified HVAC improvements, unspecified refrigeration improvements, and industrial oven/furnace.

Table 17 lists the 10 highest-saving midstream measure categories in CY 2023, based on lifecycle MMBtu savings.

Table 17. Summary of CY 2023 Annual Savings by Measure Category in the Midstream Channel

Measure Category	Verified Gross						Incentive Dollars	Incentive Dollars %
	kWh	kWh %	kW	kW %	therms	therms %		
Other-Other[a]	9,393,416	28.79%	440	18.07%	2,488,848	93.84%	$1,979,378	54.11%
Lighting-LED	20,998,656	64.36%	1,700	69.89%	0	0.00%	$1,057,432	28.91%
Domestic Hot Water-Water Heater	39,696	0.12%	2	0.08%	77,697	2.93%	$406,150	11.10%
Dishwasher, Commercial	1,762,176	5.40%	86	3.53%	4,902	0.18%	$52,900	1.45%
Fryer	0	0.00%	0	0.00%	35,621	1.34%	$43,700	1.19%
Variable Speed Drive	159,845	0.49%	9	0.39%	0	0.00%	$32,900	0.90%
HVAC-Other[b]	76,967	0.24%	14	0.58%	17,212	0.65%	$31,000	0.85%
Oven	84,299	0.26%	19	0.80%	21,420	0.81%	$28,100	0.77%
Steamer	86,700	0.27%	156	6.42%	6,414	0.24%	$23,400	0.64%
Hot Holding Cabinet	13,526	0.04%	4	0.17%	0	0.00%	$1,200	0.03%

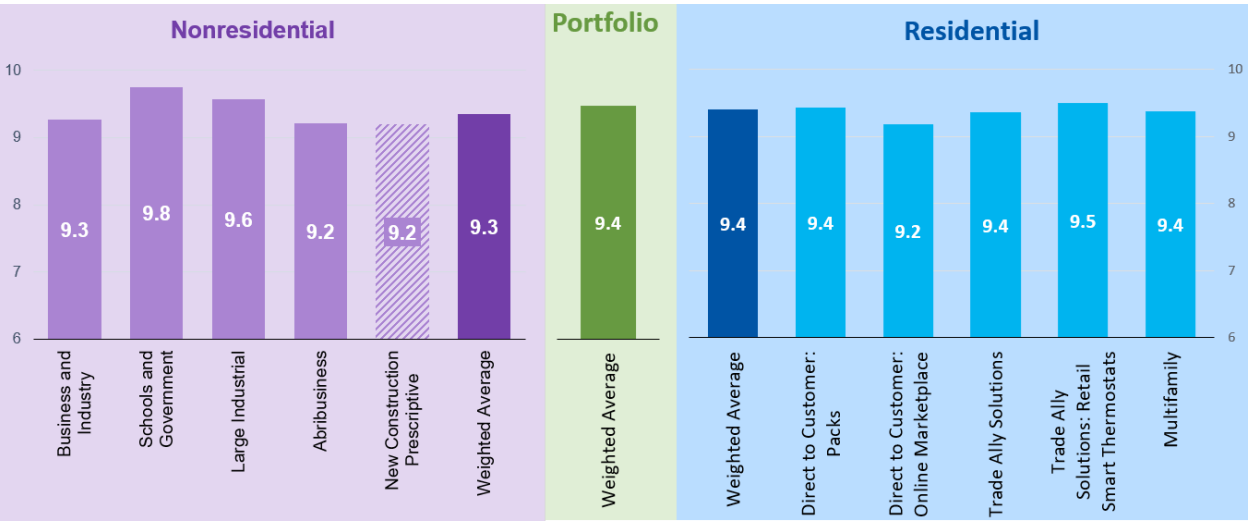
[a] Other-Other in the midstream channel includes water-saving kits and air-sealing kits.

[b] HVAC-Other in the midstream channel is made up of exclusively ductless heat pumps.

3.3. Portfolio Participant Satisfaction Findings

The program administrator fielded online customer satisfaction surveys throughout CY 2023 to residential and nonresidential program participants. Across all offerings surveyed in CY 2023, the average participation-weighted overall satisfaction rating for the portfolio was 9.4. The participation-weighted average for the residential programs was 9.4 and the average for nonresidential programs was 9.3. Figure 9 shows the average overall satisfaction ratings for the CY 2023 portfolio.

Figure 9. CY 2023 Portfolio Average Overall Satisfaction Ratings



Source: Ongoing Participant Satisfaction Online Survey Question. "Overall, how satisfied are you with your most recent experience with Focus on Energy?" Business and Industry CY 2023 (n=85); Schools and Government CY 2023 (n=45); Large Industrial CY 2023 (n=45); Agribusiness CY 2023 (n=33); New Construction Business Prescriptive CY 2023 (n=5); Packs CY 2023 (n=1,478); Online Marketplace CY 2023 (n=917); Trade Ally Solutions CY 2023 (n=1,180); Retail Smart thermostats CY 2023 (n=222); Multifamily CY 2023 (n=29).

The portfolio, residential, and nonresidential averages are weighted by total participation in the offerings surveyed. Textured bars represent results from less than 20 surveys; interpret with caution.

3.4. Residential Process Evaluation Findings

For the CY 2023 process evaluation of residential offerings, the evaluation team collected information and perspectives from Focus on Energy participants and trade allies. Table 18 shows residential process evaluation activities conducted in CY 2023 by offering.

Table 18. CY 2023 Residential Process Evaluation Activities by Program and Offering

Program	Offering	Participant Surveys	Ongoing Participant Satisfaction Surveys	Trade Ally Interviews	Contractor Survey
Direct to Customer	Online Marketplace		✓		
	Packs	✓	✓		
Multifamily	Multifamily	✓	✓		
Renewable Rewards	Residential Renewable Rewards		Surveyed with Trade Ally Solutions		
Trade Ally Solutions	Heating and Cooling	✓	✓	✓	✓
	Insulation and Air Sealing		✓		

In CY 2023, more than 140,000 residential customers in Wisconsin participated in Focus on Energy's offerings, not including an estimated 15,000 Wisconsin customers who purchased measures through the Retail offering. Residential customers installed energy-efficient measures across a wide range of technologies and achieved verified gross annual electricity savings of 63,502,586 kWh and natural gas savings of 6,143,744 therms.

Residential Participant Satisfaction

The administrator fielded online customer satisfaction surveys throughout CY 2023 for the Trade Ally Solutions Program (including the Heating and Cooling, Insulation and Air Sealing, and Renewable Rewards offerings), retail smart thermostats, the Direct to Customer Program (including the Packs and Online Marketplace offerings), and the Multifamily Program. More than 10,000 Focus on Energy residential participants completed a survey in CY 2023.[6]

Surveys asked participants 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*. Most CY 2023 respondents across offerings gave overall satisfaction ratings consistent with CY 2022 respondents, and for all residential offerings in CY 2023, average satisfaction ratings were 9.2 or higher. The only statistically significant differences were for the Direct to Customer Packs offering and the Residential

[6] The evaluation team reports ratings only to the first decimal place; therefore, it randomly sampled surveys with substantially more than 2,500 responses 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 that reported ratings for the random sample and the ratings for the larger population are identical to the first decimal place. For the Packs offering, participants completed a total of 9,745 surveys in CY 2023; the Packs offering was the only survey with more than 2,500 responses in CY 2023. After removing duplicates and applying this sampling technique, a total of 3,844 residential participants completed the satisfaction surveys analyzed for CY 2023 reporting.

portfolio average ratings, both of which decreased to 9.4 in CY 2023 from 9.5 in CY 2022.[7] Figure 10 shows average satisfaction ratings of surveyed participants for residential offerings in CY 2023 compared with ratings from CY 2022 (except the Multifamily program which was a new program in CY 2023 thus results are not available for CY 2022).

Figure 10. CY 2023 Average Overall Satisfaction Ratings for Residential Offerings



Source: Ongoing Participant Satisfaction Online Survey Question. "Overall, how satisfied are you with your most recent experience with Focus on Energy?" Trade Ally Solutions CY 2023 (n=1,180), CY 2022 (n=1,524); Retail Smart thermostats CY 2023 (n=222), CY 2022 (n=287); Packs CY 2023 (n=1,478), CY 2022 (n=1,239); Online Marketplace CY 2023 (n=917), CY 2022 (n=2,176); Multifamily CY 2023 (n=29). There was no satisfaction survey for Multifamily participants in CY 2022. The residential portfolio average is the average of all offerings surveyed during the year weighted by total participation. Boxes around percentages indicate a statistically significant difference from the CY 2022 results at p<0.10 using a t-test.

Net Promoter Score

The evaluation team calculated a net promoter score (NPS) for each offering based on the likelihood of the participant recommending 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. High NPS scores (+70 or higher) are theoretically predictive of customer behaviors, such as participating in another offering, implementing additional home energy improvements, and referring Focus on Energy offerings to others. The closer the NPS is to +100, the more favorable the respondents

[7] p<0.10 or better using a binomial *t*-test.

are toward the offering. NPS scores over +80 are considered excellent, while scores that dip below +50 warrant investigation into a possible opportunity for improvement.

Participants gave residential offerings high scores in CY 2023, with the NPS score ranging from +83 (Multifamily) to +87 (Packs). All of the residential programs' CY 2023 NPS scores were within two points of the CY 2022 score.

Awareness by Program Participants and Opinion of Utility

In addition to ongoing participant satisfaction surveys, the evaluation team fielded surveys for the Multifamily, Packs, and Heating and Cooling offerings to collect information on customers' awareness of channels, motivations to participate, specific behaviors related to certain measures, and other information. Table 19 lists the survey sample sizes and modes for each offering.

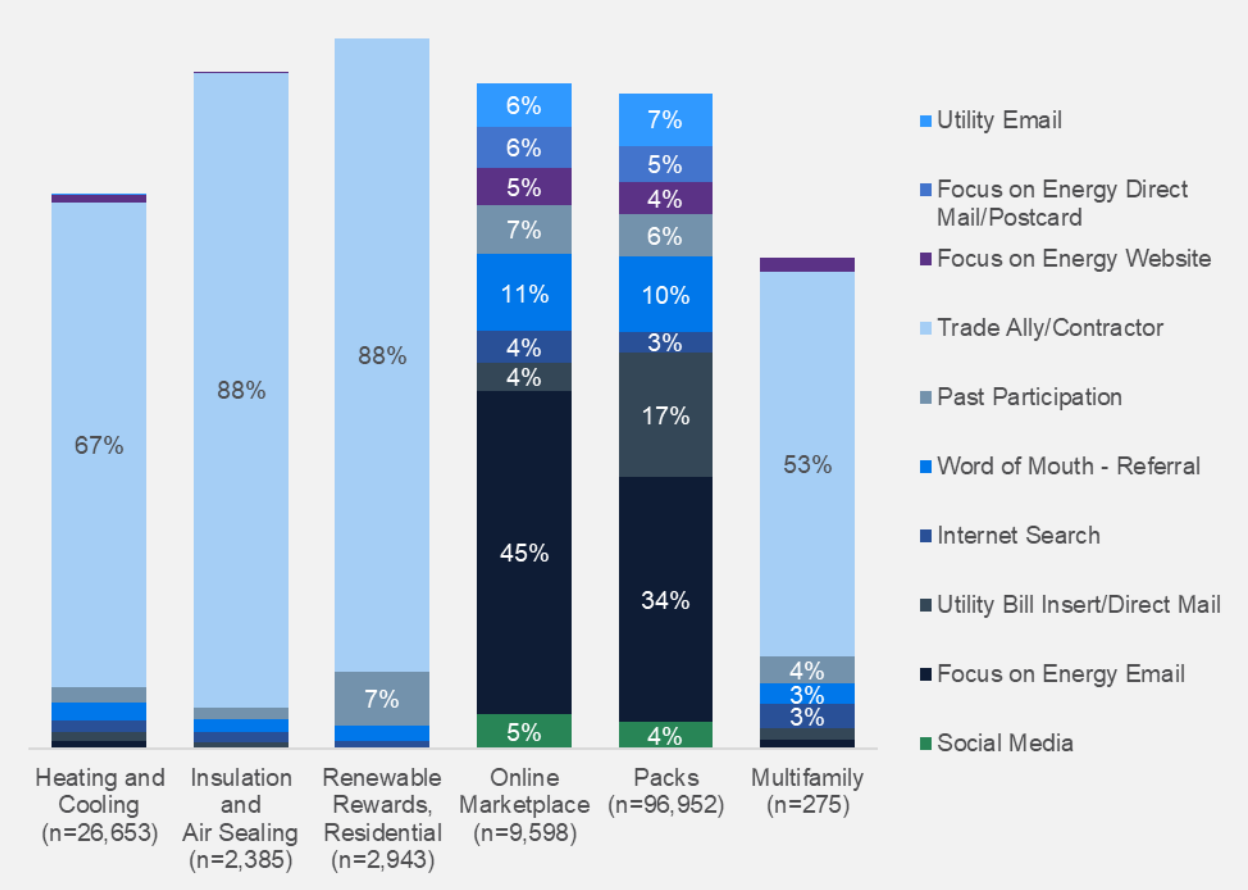
Table 19. CY 2023 Residential Sample Sizes and Research Activities by Offering

Offering	n	Activity	Mode
Multifamily	65	Survey	Online/Phone
Multifamily SEM	4	Interviews	Phone
Multifamily Energy Design Assistance/ Energy Design Review (EDA/EDR)	3	Survey	Online/Phone
Packs (Focus on Comfort pack participants)	205	Survey	Online
Heating and Cooling	830	Survey	Online

Participants' sources of awareness were also captured in SPECTRUM for each of the offerings. Similar to results from CY 2020 and CY 2021 participant surveys, the most common awareness sources for Direct to Customer offerings were a Focus on Energy email, and trade allies or contractors continued to be the main sources for the Trade Ally Solutions and the Renewable Rewards Program's Residential offering.

Figure 11 on the following page shows the reported sources of awareness for each offering except Residential New Construction, which is excluded since all participants reported the source as "other" and the participants are home builders.

Figure 11. Residential Participants' Sources of Awareness by Offering



Source: SPECTRUM Data for residential offerings "How did customer hear about focus?"

In the CY 2023 participant surveys, when asked about their preferred way to learn about Focus on Energy programs, 39% of Heating and Cooling respondents said direct mailing. This was only marginally ahead of emails from Focus on Energy (38%), promotion through other Focus on Energy programs (33%), social media (33%), and the Focus on Energy or utility website (31%). Similarly, Packs respondents said they preferred outreach similar to how they initially learned about Focus on Energy, through a Focus on Energy email (60%) and direct mail (40%). Compared to the latest Packs participant surveys in CY 2020, CY 2023 participants reported a greater preference to hear about Focus on Energy programs through an email from Focus on Energy, the Focus on Energy or utility website, and promotion through other Focus on Energy programs, with less preference for direct mail/brochure/postcard, social media, television, and word of mouth.

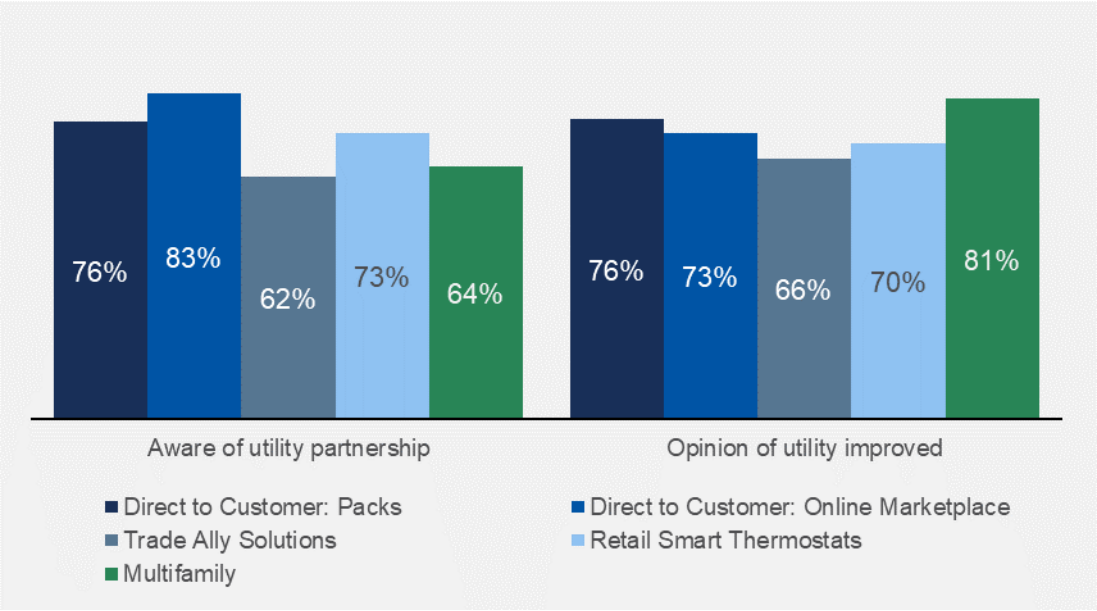
When asked about their awareness and participation in other Focus on Energy offerings, Packs respondents were mostly aware of the Insulation and Air Sealing (59%), Renewable Rewards Residential (56%), and Heating and Cooling (55%) offerings. However, the Online Marketplace was the most popular offering respondents reported participating in (39%). For Heating and Cooling, over half of the respondents reported they were aware of other Focus on Energy programs. Of those who reported they were aware, 77% participated in the Packs offering, followed by Online Marketplace (33%), Insulation and Air Sealing (13%), and Renewable Rewards Residential (10%). For offerings they had not participated

in, respondents were most aware of Insulation and Air Sealing (63%), followed closely by Renewable Rewards Residential (62%) and Residential New Construction (50%).

Focus on Energy offers tenants of apartment buildings and condos the ability to order energy-saving packs containing self-install measures including LED light bulbs, showerheads, and faucet aerators. Of the Multifamily building owner and manager survey respondents (n=57), 23% said they were aware that their tenants could receive these packs. Of these (n=13), two said they had communicated information about that offering to their tenants but were not aware if any of their tenants ordered packs.

In CY 2023, most residential survey respondents were aware that Focus on Energy offerings were offered in partnership with their local energy utility. The percentage of participants who were aware ranged from 62% of Trade Ally Solutions respondents to 83% of Online Marketplace respondents (Figure 12). Most participants also reported that Focus on Energy offerings made their opinion of their utility *much more favorable* or *somewhat more favorable*, ranging from 66% for Trade Ally Solutions to 81% for Multifamily. These results were consistent with survey respondents' levels of awareness and opinion of utilities CY 2022.

Figure 12. Residential Participants' Awareness and Opinion of Utility Partnerships with Focus on Energy



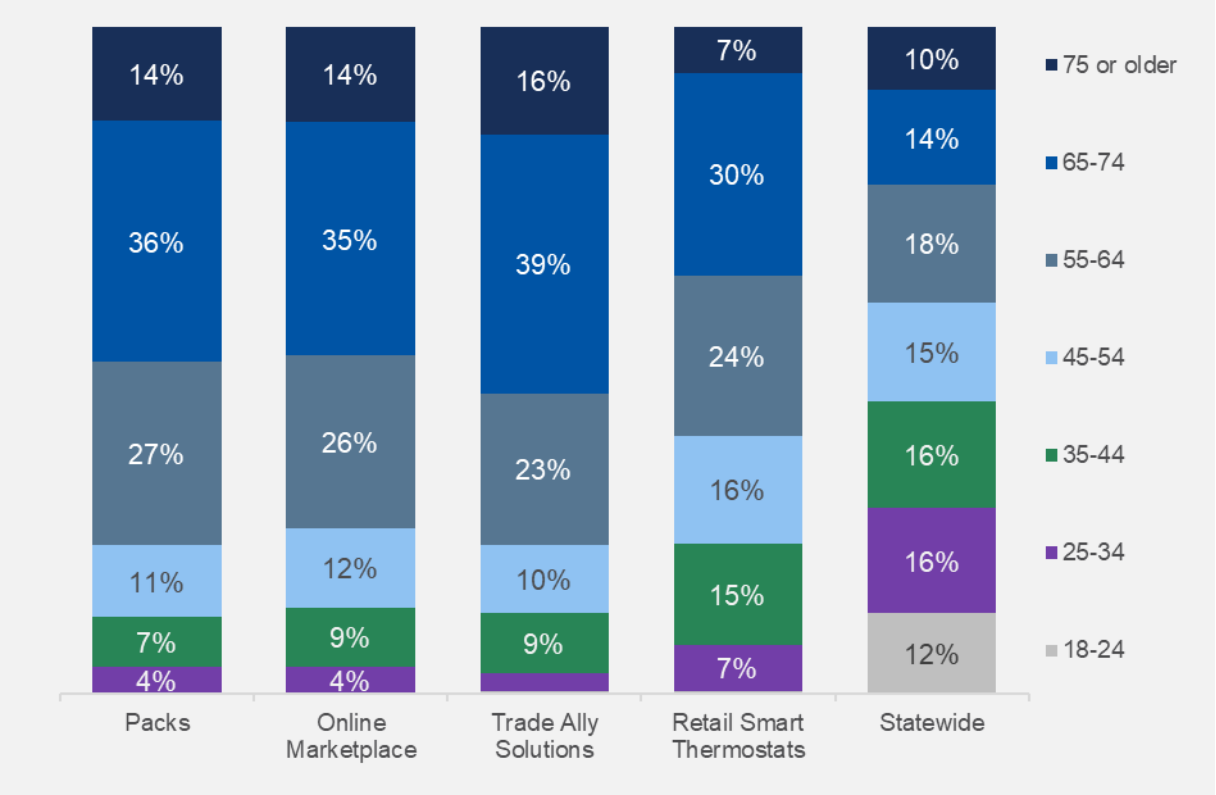
Offering source: Participant Satisfaction Survey Questions. "The Focus on Energy program you participated in is offered in partnership with your local energy utility. Before taking this survey, was this something you were aware of?" Trade Ally Solutions CY 2023 (n=1,174); Packs CY 2023 (n=1,463); Retail Smart thermostats CY 2023 (n=221); Online Marketplace CY 2023 (n=908); Multifamily CY 2023 (n=28).
"How have these offerings affected your opinion of your energy utility, if at all?" Trade Ally Solutions CY 2023 (n=1,069); Packs CY 2023 (n=1,386); Retail Smart thermostats CY 2023 (n=208); Online Marketplace CY 2023 (n=849); Multifamily CY 2023 (n=27).

Residential Participant Profile

The evaluation team assessed what market segments are participating in residential programs and offerings and to what extent the programs are reaching all segments of the market. The team compared demographic data collected in ongoing participant satisfaction surveys and data from the U. S. Census Bureau's 2022 American Community Survey in Wisconsin.

Figure 13 shows the age distribution of survey respondents by offering and of Wisconsin residents, according to the 2022 American Community Survey data.[8] The American Community Survey data indicate that the Wisconsin adult population is relatively evenly distributed across all age ranges. However, most of Focus on Energy's participants were aged 55 to 74 (54% to 63% by offering).

Figure 13. Residential Participants' Age

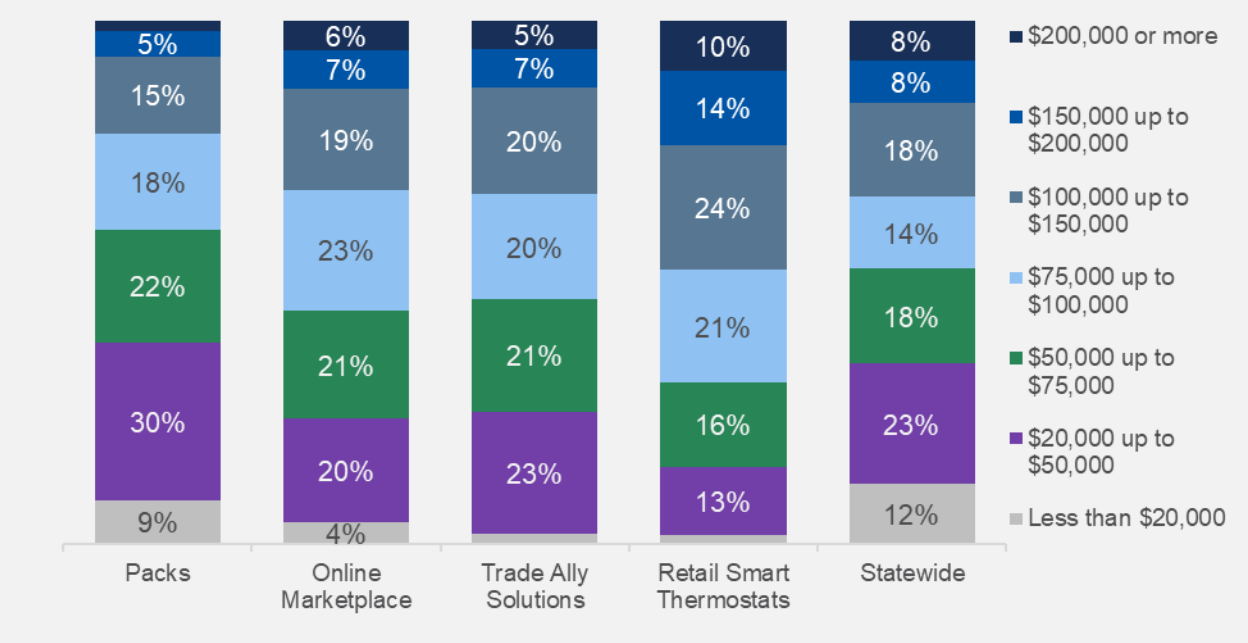


Offering source: Participant Satisfaction Survey Question. "Which of the following categories best represents your age?" Trade Ally Solutions (n=1,151), Packs (n=1,432), Online Marketplace (n=892), Retail Smart thermostats (n=217). Statewide source: Census 2022 American Community Survey, Selected Social Characteristics in the United States. Percentages of 3% or less are not labeled in the figure. Multifamily participant satisfaction surveys were conducted with landlords and did not collect demographic data; therefore, results are not presented here.

[8] U.S. Census. "Wisconsin." Accessed March 2024. https://data.census.gov/table/

Figure 14 shows the household income range of survey respondents relative to the general population. The American Community Survey data show that Wisconsin households are evenly distributed across income levels up to $150,000, with smaller percentages of households above $150,000. Focus on Energy offerings reflect this distribution well, except that most offerings are less likely to include customers in the lowest income bracket. Respondents in the Packs offering were the most likely to be in lower income brackets (39% under $75,000) and the least likely to be in higher income brackets (7% over $150,000). Retail Smart thermostat respondents were the most likely to have incomes over $100,000 (48%, compared to 34% statewide).

Figure 14. Residential Participants' Income Level



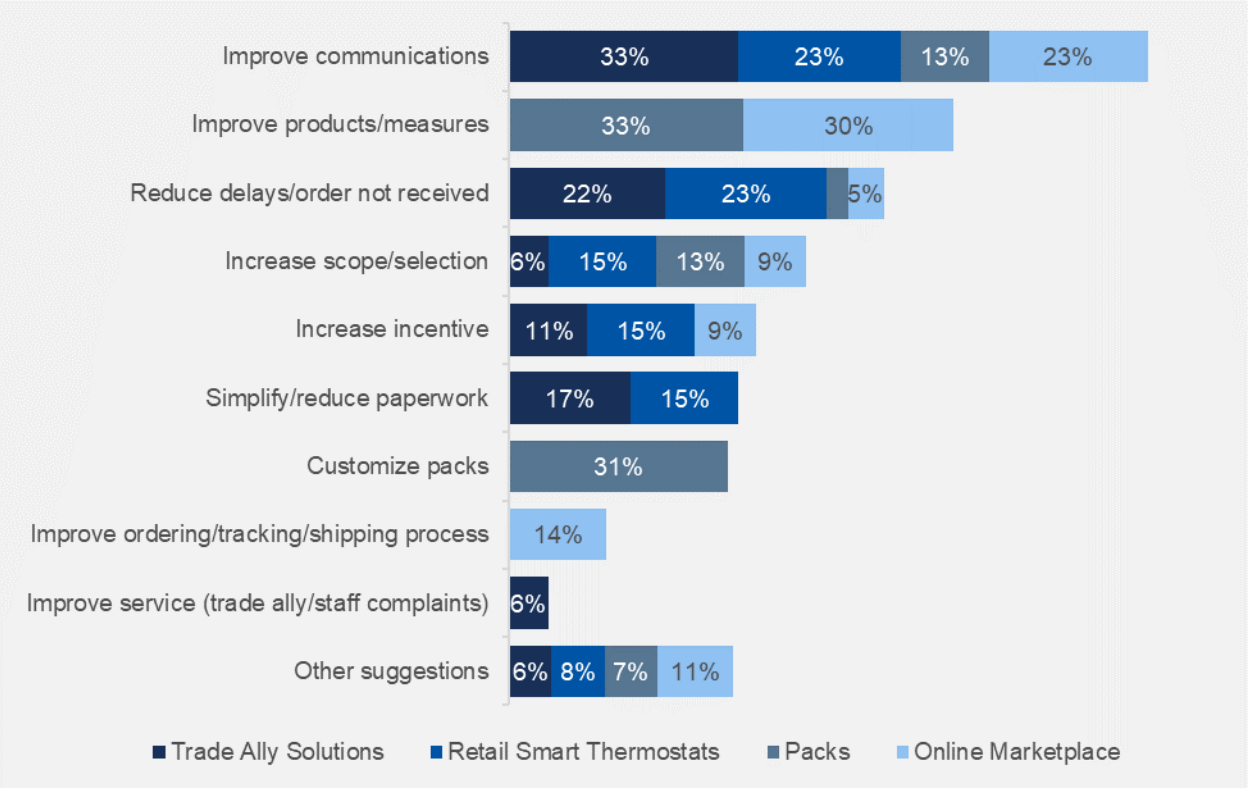
Offering source: Participant Satisfaction Survey Question. "Which category best describes your total household income before taxes?" Trade Ally Solutions (n=856), Packs (n=1,032), Online Marketplace (n=674), Retail Smart thermostats (n=168). Statewide source: Census 2022 American Community Survey, Selected Social Characteristics in the United States. Percentages of 3% or less are not labeled in the figure. Multifamily participant satisfaction surveys were conducted with landlords and did not collect demographic data; therefore, results are not presented here.

Participant Recommendations

The evaluation team analyzed open-ended comments and suggestions made by satisfaction survey respondents. Most comments from CY 2023 respondents in the Packs (64%), Retail Smart thermostats (66%), and Multifamily offerings (100% of 8 comments) were positive or complimentary, though Trade Ally Solutions (51% positive) and Online Marketplace (50% positive) responses were more evenly divided between compliments and suggestions. The suggestions for improvement are summarized in Figure 15.

Across all residential programs, the most common suggestion was to improve communications by providing more information about offerings and promoting them more effectively (13% to 33% of suggestions by offering). This was also the most common category of suggestions from CY 2022 respondents. Some suggestions were unique to specific offerings. Simplifying and reducing paperwork was mentioned only by Trade Ally Solutions (17%) and Retail Smart thermostat respondents (15%, lower than the rate of 32% making this suggestion in CY 2022); these respondents were also the most likely to suggest reducing delays (22% Trade Ally Solutions, 23% Retail Smart thermostats). The most common suggestions from Packs respondents were about improving the products in the packs (33%, higher than 16% in CY 2022) and customizing the items in the packs (31%). The most common suggestion from Online Marketplace respondents was also to improve the products (30%, up from 11% in CY 2022) and 14% of their suggestions related to improving ordering, tracking, and shipping processes.

Figure 15. Residential Participants' Suggestions for Improving Offerings



Offering source: Participant Satisfaction Survey Question. "Please tell us more about your experience and any suggestions for improvement." Total suggestions for improvement Trade Ally n=162, Retail Smart thermostats n=13, Packs n=168, Online Marketplace n=137. Multifamily respondents did not offer any suggestions for improvement.

Note: Unlabeled segments represent 3% or less of respondents.

3.5. Nonresidential Process Evaluation Findings

For the CY 2023 process evaluation of nonresidential programs, the evaluation team collected information and perspectives from Focus on Energy participants and trade allies. Table 20 shows process evaluation activities by nonresidential offering.

Table 20. CY 2023 Nonresidential Process Evaluation Activities by Program and Offering

Program	Offering	Participant Surveys	Ongoing Participant Satisfaction Surveys	Trade Ally Interviews
Agribusiness	Agribusiness	✓	✓	✓
Business and Industry	Commercial and Industrial	✓	✓	✓
Large Industrial	Large Industrial	✓	✓	✓
Schools and Government	Schools	✓	✓	✓
	Government	✓		✓
Multiple	EDA/EDR	✓	✓	✓

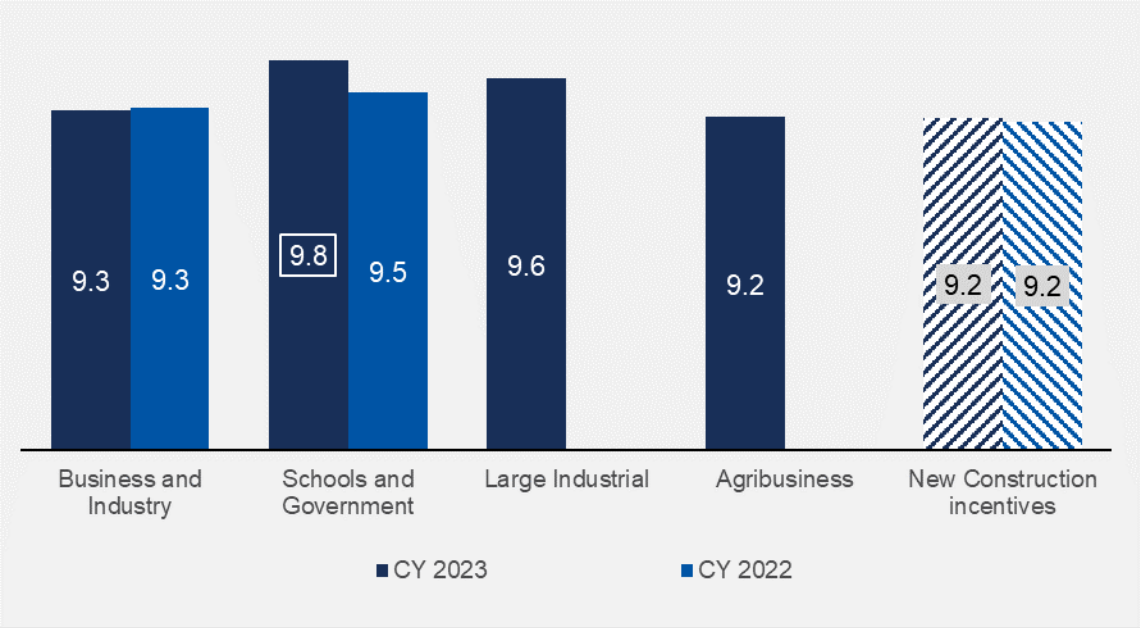
Nonresidential Participant Satisfaction

During CY 2023, the administrator fielded online surveys that asked participants in the Agribusiness, Business and Industry, Schools and Government, and Large Industrial programs, as well as New Construction incentives, to rate how satisfied they were with Focus on Energy's offerings and provide recommendations for improving the programs. In CY 2023, 213 Focus on Energy nonresidential participants completed a survey.

The surveys used a satisfaction scale from 0 to 10, where 10 meant *extremely satisfied* and 0 meant *not at all satisfied*. In CY 2023, across all nonresidential offerings surveyed, the participation-weighted average overall satisfaction rating was 9.3, consistent with the average ratings from the previous four years (9.3 to 9.4). Average ratings in CY 2023 ranged from 9.2 for Agribusiness and New Construction incentives up to 9.8 for Schools and Government. Schools and Government was the only program with a statistically significant change in satisfaction ratings in CY 2023, increasing from 9.5 in CY 2022. In CY 2022, Large Industrial and Agribusiness customers received the Business and Industry survey, rather than individual program surveys.

Figure 16 on the following page shows a comparison of the survey respondents' average satisfaction ratings with nonresidential offerings in CY 2023 and CY 2022.

Figure 16. CY 2023 Average Overall Satisfaction Ratings for Nonresidential Offerings



Source: Ongoing Participant Satisfaction Online Survey Question. "Overall, how satisfied are you with your most recent experience with Focus on Energy?" Business Incentive CY 2023 (n=85), CY 2022 (n=193); Schools and Government CY 2023 (n=45), CY 2022 (n=100); Large Industrial CY 2023 (n=45); Agribusiness CY 2023 (n=33); New Construction incentives CY 2023 (n=5), CY 2022 (n=6); The nonresidential portfolio average is the average of all programs surveyed during the year weighted by total program participation. Textured bars represent results from less than 20 surveys; interpret with caution.

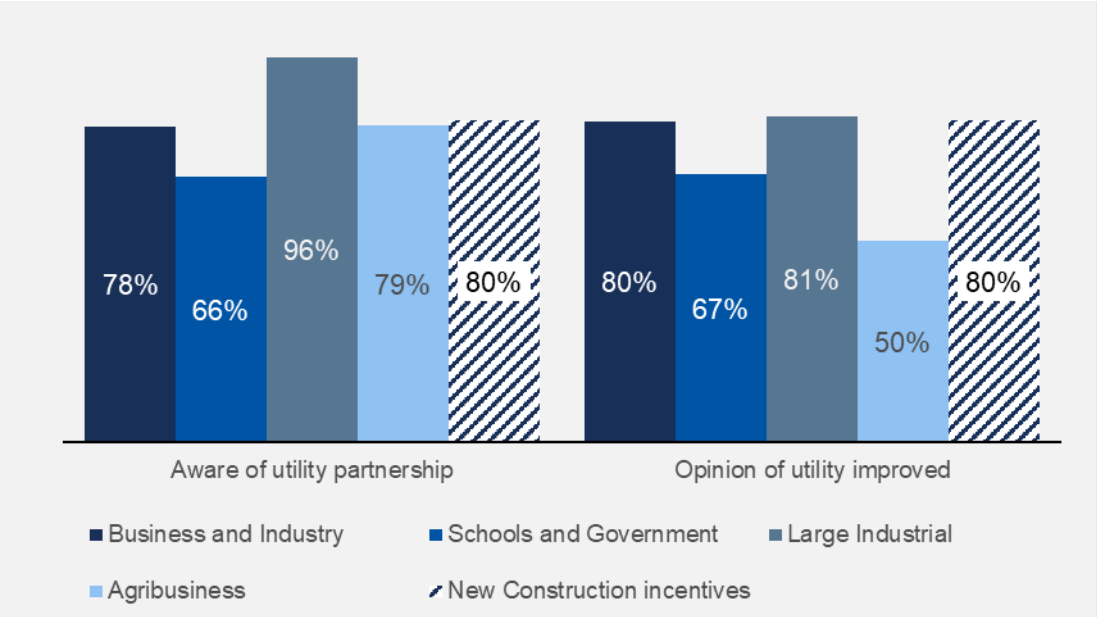
Net Promoter Score

The evaluation team calculated an NPS score for each offering based on the likelihood of the participant to recommend it. Generally, a positive NPS score of +60 or better is interpreted as good, and the closer the NPS is to +100, the more favorable the respondents are toward the offering. All nonresidential offerings surveyed received a high NPS in CY 2023. The Schools and Government Program had the highest NPS at +100 (every survey respondent was a promoter), followed closely by Large Industrial with an NPS of +98, while Agribusiness had the lowest nonresidential NPS at +79.

Awareness and Opinion of Utilities' Role

Most nonresidential survey respondents were aware that Focus on Energy programs were offered in partnership with their local energy utility, ranging from 66% of Schools and Government respondents to 96% of Large Industrial respondents (Figure 17). Most respondents also reported that Focus on Energy offerings made their opinion of their utility *much more favorable* or *somewhat more favorable*, ranging from 50% of Agribusiness respondents to 81% of Large Industrial respondents.

Figure 17. Nonresidential Participants' Awareness and Opinion of Utility Partnerships with Focus on Energy



Offering source: Participant Satisfaction Survey Questions. "The Focus on Energy program you participated in is offered in partnership with your local energy utility. Before taking this survey, was this something you were aware of?" Business Incentive (n=83); Schools and Government (n=44); Large Industrial (n=45; Agribusiness (n=33); New Construction incentives (n=5).

"How have these offerings affected your opinion of your energy utility, if at all?" Business Incentive (n=74); Schools and Government (n=42); Large Industrial (n=42); Agribusiness (n=32); New Construction incentives (n=5).

Participant Recommendations

The evaluation team analyzed open-ended comments and suggestions made by satisfaction survey respondents. Most survey respondents' comments were complimentary and expressed a positive experience with the offering they participated in, ranging from 67% positive comments for Agribusiness and New Construction Prescriptive (6 comments each) to 92% positive comments for Schools and Government (12 comments).

Across all 213 nonresidential satisfaction surveys completed in CY 2023, respondents' open-ended comments only included 14 suggestions for improvement. Respondents offered six suggestions for improving the Business and Industry Program, the largest number of suggestions for a nonresidential program in CY 2023. The most frequent suggestions across all nonresidential programs were to improve communications (5 suggestions) and reduce delays in approval and payment of incentives (4 suggestions).

The CY 2023 surveys included a new open-ended question soliciting feedback about participants' experience with trade allies. Respondents' comments were mostly complimentary toward the trade allies, consistent with the high satisfaction ratings for trade allies. However, there were seven suggestions for improvement: three apiece provided by Business and Industry and Schools and

Government respondents, and one from a Large Industrial respondent (there were no suggestions for improvement from Agribusiness respondents). Three respondents requested better communications with their contractors, one was disappointed in the contractor's level of expertise, one thought the contractor took too long to complete the project, one faced unanticipated challenges with the lighting measures their contractor recommended, and one respondent submitted their own incentive application after their trade ally declined to do it for them.

Customer and Trade Ally Experience

For the CY 2023 evaluation of Focus on Energy's nonresidential programs, the evaluation team conducted phone and online surveys with customers and in-depth phone interviews with trade allies to assess their experience and program attribution, and to gather feedback on the nonresidential portfolio.

The evaluation team surveyed 285 program participants and interviewed 52 trade allies from the Agribusiness, Business and Industry, Large Industrial, and Schools and Government Programs. Most survey respondents (73%) said they had participated in a Focus on Energy program before. When they were asked to compare their current experience with Focus on Energy with previous years, 81% said it was similar while 19% said it was better. Trade allies reported history with Focus on Energy programs—all had previously been a program trade ally, ranging from two to 20 years, with most having more than 10 years of program involvement. The following sections summarize survey results across all programs and offerings. Program-specific results can be found within individual program chapters in Volume II.

Trade Ally Motivations and Satisfaction

The main reason that most trade allies (16 of 24 trade allies) said they participated in Focus on Energy was to offer incentives to their customers. Trade allies also frequently mentioned how the program can help customers either decide on projects or select more efficient products, or that the incentives help them to stand out from their competition and gain a competitive edge. Fourteen trade allies said that help from program energy advisors was the most valuable factor for their ongoing participation in the program. Trade allies had mixed responses concerning the current value of the incentives and how often the incentives influence projects. Of the 24 trade allies who responded to the questions, three said the incentives were *very influential*, 16 said they were *somewhat influential*, five said they were *not very influential*, and two said it depended on the customer and project.

Overall, interviewed trade allies expressed high satisfaction with each of the individual program offerings on a scale of 1 to 5 (n=35), with 5 meaning *very satisfied.* Trade allies provided an overall program satisfaction score of 4.3, specifically calling out the ease of participation, support from the energy advisors, trade ally bonuses, and marketing templates as benefits.

Trade allies most frequently suggested the following improvements: creating an online application portal, providing trade ally incentives to offset paperwork costs, and increasing their communication with energy advisors.

Customer Resources for Program Information

Surveyed customers (n=281) said when they look for information on Focus on Energy programs, Focus on Energy advisors were the most common source of information across all programs (49%). Respondents who received support from an energy advisor (n=152) were overwhelmingly satisfied with the support they received, with 93% of participants across all programs reporting that they were *very satisfied*.

A minority of survey respondents (16%, n=201) said they had participated in a Focus on Energy training in the past two years. Of those who had previously participated in a Focus on Energy training (n=32), over half of the respondents said that the training was either *somewhat important* (38%) or *very important* (19%) in their decision to complete their program-eligible project.

Application Process

Among survey respondents who said they had completed the application paperwork themselves (n=79), very few reported any difficulty with the application. Only 5% reported it was a mix of easy and challenging and no one reported that it was *mostly* or *very challenging*. The evaluation team also discussed feedback about the application process with trade allies. In general, trade allies were satisfied with the application process, but some said they rely heavily on assistance from energy advisors to either fully complete their applications or provide specific pieces of information.

Customer Motivations to Participate

Across all surveys (n=285), nonresidential survey respondents said saving money was the most important factor motivating their energy efficiency upgrades (35%), followed by reducing energy consumption or demand (32%). Correspondingly, most respondents (n=279) reported that cost was their biggest challenge in implementing energy efficiency upgrades (61%), while internal decision-making or budgeting processes (14%) and limited staffing or time (10%) were reported less frequently (differences are statistically significant).

Remaining Nonresidential Lighting Potential

Specific participant survey questions about remaining lighting potential found that 47% of respondents across all nonresidential programs (n=284) had mostly or fully converted their existing lighting to LEDs, while slightly less than 10% had upgraded less than a quarter of their facilities with LEDs. Of those who had not fully converted (n=253), 30% planned to upgrade all remaining lighting to LED, and 39% planned to upgrade some of their remaining lighting to LED. When asked about familiarity, use of, and plans for advanced lighting controls, 44% (n=213) of customers were not familiar with advanced lighting controls 27% (n=111) had no advanced lighting controls in use, and 58% (n=106) had no plans to upgrade their lighting using advanced lighting controls.

Inflation Reduction Act

Nonresidential program trade ally interviews and participant surveys included questions about the awareness and impact of the Inflation Reduction Act (IRA) tax incentives. The majority of trade allies (55%, n=29) said they were *not aware* of IRA opportunities, while 31% said they were *somewhat aware,* and 14% said they were *very aware* of opportunities created by the legislation. Most trade allies said

they were interested in learning how to apply IRA tax incentives to their work and their customer needs. Survey respondents also reported low familiarity with the IRA, with only 24% (n=285) saying they were aware of the opportunities. Of those who were aware, 36% said it made them look for more savings opportunities and 13% said it accelerated their decisions around energy efficiency upgrades.

3.6. Midstream Process Evaluation Findings

For the CY 2023 evaluation of Focus on Energy's Midstream Program, the evaluation team used surveys and interviews to assess participants', trade allies', and Community-based organizations' (CBOs') experiences with the program, determine program attribution, and gather feedback on the Midstream Program. Table 21 shows Midstream process evaluation activities by offering.

Table 21. CY 2023 Midstream Process Evaluation Activities by Program and Offering

Offering	Participant Surveys	Contractor Interviews	Distributor Interviews	CBO Interviews
Midstream Contractor	✓	✓	✓	
Community-Based Organization				✓

Midstream Contractor Offering

Through the Midstream Contractor offering, Focus on Energy pays incentives for high-efficiency equipment directly to distributors, who can keep some of the incentives or pass it all on to contractors. The following sections summarize findings from conversations with participating distributors and contractors.

Distributor Experience

The evaluation team interviewed four distributors who had provided either water heaters or circulator pumps through the program. Participating distributors had the option to keep up to 40% of the incentive to cover administrative costs related to participation or offer spiffs to encourage sales staff to promote qualifying equipment. Three of the interviewed distributors said they passed 100% of the discount to contractors, while one distributor kept some of the incentive money. Those who reported they did not keep the incentive said that they would have liked to but thought there was a market expectation stemming from marketing messages that the entire incentive amount should be passed on to the customer.

The evaluation team asked distributors about their initial motivations for offering the Midstream incentive and the benefits they may have experienced from doing so. Three distributors said they wanted to sell more products by increasing awareness and demand, three said they were motivated to save their customers (contractors) money, and two said they were motivated to better promote energy-efficient equipment.

Program Satisfaction

The team asked interviewed distributors and contractors to rank their satisfaction with the program on a scale of 1 to 10, where 1 meant *not at all satisfied* and 10 meant *very satisfied*. Two out of three distributors ranked the program as 8, and one ranked it as 9. Similarly, the six surveyed contractors who indicated some level of awareness of the Midstream Contractor offering provided an average score of 8.5.

The interviewers asked distributors what was working well with the offering. Of the three respondents, one said that the Midstream channel took the burden of up-front costs off those who could not afford it, another said the program helped to get energy-efficient products into the marketplace, and a third said that the program was simple to participate in.

When asked about desired program changes, distributors offered the following suggestions:

- Increase marketing to contractors (3 distributors).
- Simplify the contractor paperwork (2 distributors).
- Promote more types of equipment, higher incentives, and more concrete guidance on funds to keep versus distribute (1 distributor each).

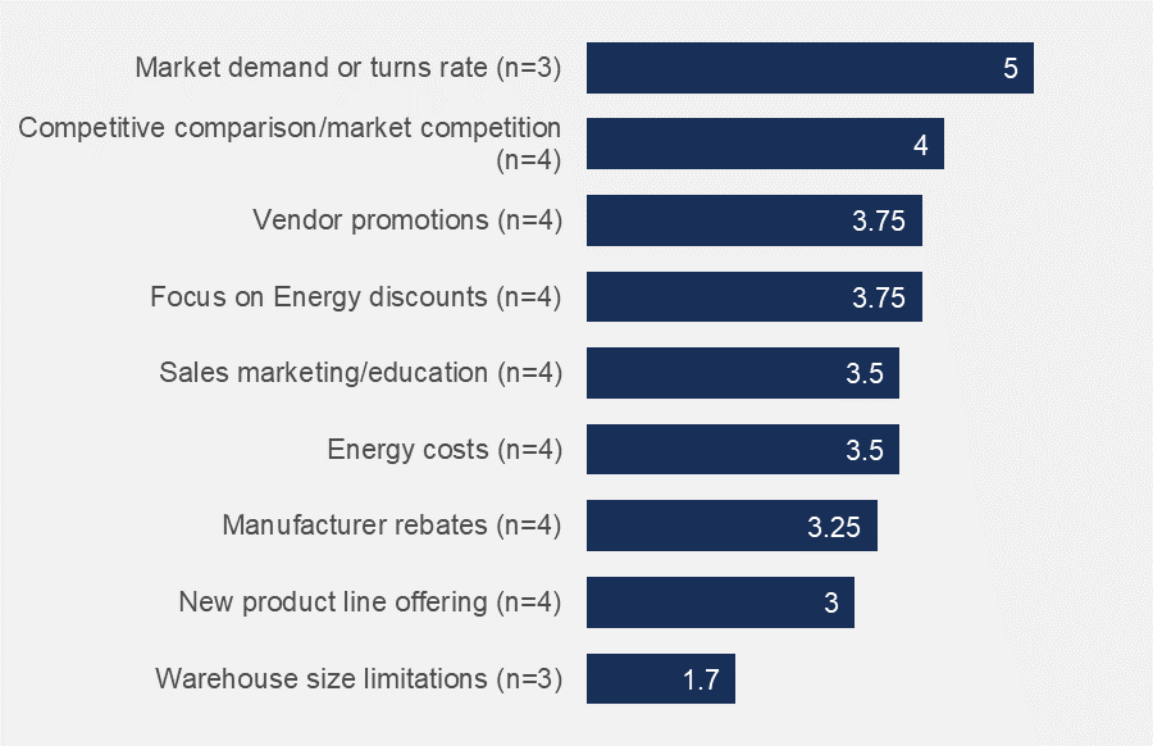
Most contractors (12 contractors) did not identify any changes. Those who did (9 contractors) made a variety of suggestions, including increasing advertising or communications, making applications easier, increasing the discounts, and improving clarity around where the discount is coming from and how it is distributed between the customer and contractor.

Stocking Practices

When asked how their stocking of high-efficiency units would differ if the Focus on Energy incentives were not available, distributors said the Midstream Contractor offering strongly influenced their stocking practices of these units. Two said that without the offering they would likely stock half of the high-efficiency unit quantities, and one estimated a quarter of the high-efficiency units they currently offer absent the program. Two of the four distributors thought they would increase their stock of high-efficiency units in CY 2024 compared to CY 2023.

The contractor survey asked contractors about their stocking practices and any ways in which the Midstream Contractor offering had influenced their decisions. The majority of contractors (10 respondents) said that they do not maintain a stock of equipment; rather, they purchase equipment on an as-needed basis. Seven contractors said that they always keep a supply of equipment in stock, and two said they use a combination of both practices. The contractors who stock equipment and said that their stocking practices are not subject to seasonal variations, rated the importance of various influences on their stocking practices using a 1 to 5 scale, where 1 meant *not at all influential* and 5 meant *very influential* (Figure 18). These contractors rated market demand/turnover rate as the single biggest influence on their stocking practices (5), followed by competitive comparison/market competition (4), vendor promotions (3.75), and Focus on Energy discounts (3.75).

Figure 18. Influences on Contractors' High-Efficiency Equipment Stocking Practices



Community-Based Organization Offering

The evaluation team interviewed 10 CBO participants who represented a variety of organizations, including three food pantries, two churches, a municipality, a homeless shelter, and three other nonprofits that provide low-income community services. The respondents reported a variety of reasons for participating in the CBO offering; however, the common theme was that the program provides an additional opportunity to offer a service to their customers and support their community. Respondents continually said they were satisfied with program representatives, program processes, and the ability to serve their communities.

CBO Kit Distribution

Respondents reported a variety of methods for distributing kits. Five respondents said they tried to align kit distribution with recurring (weekly, biweekly, or monthly) food bank distribution events and asked customers if they wanted a kit before giving it to them. One church respondent said they have a standing food pantry that is always accessible and they typically leave a few kits for customers to take as they please. Two respondents said they sell the kits in their storefront and charge customers a nominal price for them. Other distribution methods included community Christmas/holiday parties (1 nonprofit), a giveaway in a transition box for people moving out of the shelter (1 homeless shelter), and advertising their availability through utility bills (1 municipality).

When asked about the process of requesting kits from Focus on Energy, nine respondents said that the process was simple and that the time to receive the kits was consistently fast. Many respondents also

said they prefer that the program contact them to see if they need more kits rather than having to reach out to themselves.

CBO Participation and Challenges

Nine respondents agreed that the program provides adequate support and that they know where to go if they have questions or requests. Six respondents said they did not experience any difficulty in their program participation. However, several organizations reported isolated difficulties, such as miscommunication or poor communication about the location and timing of delivery, confusion about the kit's contents without opening the kit, and the weatherization kits taking up more space than available.

4. 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 programs' designs prior to their implementation each year.

Maintaining consistency between planning and evaluation approaches is critical to understanding how performance compares with expectations. As presented in this section, the evaluation team used the same calculator as the administrator and implementers to evaluate the cost-effectiveness of the Focus on Energy programs in CY 2023.

As directed by the PSC, the modified total resource cost (TRC) test is considered the primary test in assessing the cost-effectiveness of individual programs and offerings and of the entire Focus on Energy portfolio.[9] The PSC also directed that three additional tests be conducted for advisory purposes: an expanded TRC that includes net economic benefits, the utility administrator cost test (UAT), and the societal test.

NTG ratios can have a significant effect on TRC, UAT, and societal test results. The evaluation team applied NTG ratios to impacts to measure the gains resulting from Focus on Energy activities. NTG ratios account for the energy savings that would have been achieved without the efficiency programs (when the NTG ratio is less than 1.0, savings are reduced, and when the NTG ratio is greater than 1.0, savings are increased).

On the cost side, the team removed expenditures that would have occurred without the efficiency effort. These expenditures include incremental measure costs and lost revenues, both of which are multiplied by the NTG ratio. The evaluation team did not apply the NTG ratio to costs that would not have occurred in absence of the program (such as program and administrative costs).

4.1. Test Description

The evaluation team, as well as the administrator in developing its cost-effectiveness calculator, use methods adapted from the California Standard Practice Manual, the conventional standard of cost-effectiveness analysis for energy efficiency programs in the United States.[10] The modified TRC is described below, and the detailed descriptions and results for the expanded TRC, the UAT, and the societal test are in Appendix I. Cost-Effectiveness and Emissions Methodology and Analysis in Volume III.

The TRC test 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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9 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

10 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 test to the societal test, which expands the test inputs to provide a more holistic societal perspective. The TRC test includes total participant and administrator costs and estimates benefits in the form of avoided utility costs. Common modifications to the standard TRC test often involve reducing the discount rate or including various environmental and other non-energy benefits (such as emissions reduction benefits). Wisconsin's version of the modified TRC test accounts for the standard TRC test costs and benefits and is modified to also include monetized benefits of reduced emissions (carbon dioxide, sulfur oxide, and nitrogen oxide) due to saving energy.

In CY 2023, the evaluation team used the modified TRC test to determine if the offerings were cost-effective from a regulatory perspective (as directed by the PSC) and, where feasible, measured the overall impacts of the benefits and costs of these offerings on the State of Wisconsin. In general, the test compares all benefits and costs that can be measured with a high degree of confidence, including any net avoided emissions that have commission-established values. The test's purpose is to determine if the total costs residents, businesses, and Focus on Energy incur for operating the offerings are outweighed by the total benefits they receive.

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

The benefit/cost equation used for the modified TRC test is:

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

Where:

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

4.2. Interpreting Test Results

No single benefit/cost test can provide a comprehensive understanding of program performance or impacts in isolation. The results of tests that measure overall program cost-effectiveness, such as the modified TRC test, should be reviewed along with the results of other tests such as the UAT. Such a multi-perspective approach warrants a clear understanding of the tradeoffs among the tests.

Because of changes in avoided electric energy and natural gas costs and in emissions allowance prices for Quadrennium IV, the cost-effectiveness results reported for Focus on Energy here are not directly comparable with results from the CY 2019-CY 2022 quadrennium. The changes to avoided costs decreased the benefit/cost test results across all offerings when compared with the avoided costs used in the previous quadrennium. This was particularly substantial for electricity generation and capacity benefits.

Additionally, for the in CY 2023 evaluation, market effects savings were included in verified net savings for the Residential New Construction Program.[11] The inclusion of these market effects significantly increased CY 2023 Residential New Construction net savings without increasing program costs. This resulted in significantly higher modified TRC results for Residential New Construction in CY 2023 compared to CY 2022.

4.3. Value of Net Saved Energy

The value of energy saved, or displaced, equals the net energy saved multiplied by the utility-avoided cost of not having to generate or purchase 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).[12] 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).[13] The methodologies established under the aforementioned PSC Orders were maintained by the PSC in its Final Decision for the Quadrennial Planning Process IV.[14]

The source for electric energy avoided costs in the CY 2023 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.[15]

Avoided natural gas costs are calculated based on Energy Information Administration 2023 Annual Energy Outlook forecasts of Henry Hub prices, adjusted using Wisconsin City Gate prices and retail prices.

The PSC established the methodology to estimate avoided electric transmission and distribution (T&D) costs for the CY 2019-CY 2022 quadrennium, under PSC docket 5-FE-101 (PSC REF#: 406591). Avoided

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11 Additional details can be found in the *Market Effects for Non-Program Homes* section of the Residential New Construction chapter in Volume II.

12 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

13 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

14 Public Service Commission of Wisconsin. November 14, 2022. Quadrennial Planning Process IV. Order PSC Docket 5-FE-104, REF#: 453081. https://apps.psc.wi.gov/ERF/ERFview/viewdoc.aspx?docid=453081

15 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/#t=10&p=0&s=MarketReportPublished&sd=desc

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.[16]

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 factor of 8% to account for distribution losses. Table 22 the assumptions for the CY 2022 (the final year of Quadrennium III of Focus on Energy) and CY 2023 (the first year of Quadrennium IV of Focus on Energy) evaluation avoided costs used for the cost-effectiveness tests.

Table 22. CY 2022 and CY 2023Avoided Cost Comparison

Avoided Cost	CY 2022	CY 2023
Electric Energy ($/kWh)[a]	$0.03093–$0.05429	$0.0299—$0.0210
Electric Capacity ($/kW year)	$131.38–$182.67	$129.05—$156.37
Gas ($/therms)	$0.546–$0.797	$0.463—$0.595
Transmission and Distribution ($/kW year)	$66.47–$68.88	$49.25—$53.37
Avoided Cost Inflation	0%	0%
Real Discount Rate	2%	2%
Line Loss	8%	8%

4.4. Emissions Benefits

The modified TRC benefit/cost calculations include the benefit of avoiding three air pollutants regulated under the Clean Air Act: carbon dioxide, sulfur dioxide, and nitrogen oxide. Determining the emissions benefits requires three key parameters: lifecycle net energy savings, emissions factors or a tool that uses emissions factors, and the dollar value of the displaced emissions.

Emissions factors are the rate at which the criteria pollutants are emitted per unit of energy generated and are most often expressed in tons of pollutant per energy unit. Electric emissions impacts are measured in tons per megawatt-hour (MWh), and gas impacts are measured in tons per thousand therms (MThm). The product of the emissions factor and the net energy savings is the total weight of air pollutant offset or avoided by the program.

The product of the total tonnage of pollutant saved and the dollar value of the reduced emissions per ton is, therefore, the avoided emissions benefit, as shown in this equation:

$$Value\ of\ Avoided\ Emissions = [Net\ Saved\ Energy\ x\ Emissions\ Factor\ x\ Value\ of\ Emissions\ Allowance]$$

[16] 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.

For CY 2023, the evaluation team assessed the electric emissions benefits for Focus on Energy using AVoided Emissions and geneRation Tool (AVERT), a tool developed by the Environmental Protection Agency (EPA) to calculate avoided emissions from renewable energy and energy efficiency programs. AVERT is a spreadsheet-based model that uses historical hourly generation and emissions data to determine the individual power plants that are likely to be displaced by energy efficiency or renewable energy during each hour of the year.

Savings for Focus on Energy offerings are run through a region-specific version of AVERT to calculate the electric emissions benefits per offering. AVERT uses a model from the previous year to compare the electricity generation avoided by the Focus on Energy offerings during each hour of the year with the hourly generation information to determine the quantity of emissions displaced.

Table 23 lists the gas emissions factor and allowance prices. For CY 2023, the electric emissions scalar was 853.20 tons of carbon dioxide per GWh. Note that this can be used to estimate avoided tons of carbon from electric savings; however, it is not exact, will not apply for any other years or regions, and will vary in results based on input GWh.

Table 23. Emissions Factors and Allowance Price

Service Fuel Type	Carbon Dioxide	Nitrogen Oxide	Sulfur Dioxide
Gas Emissions Factor (Tons/MThm)	5.85	N/A	N/A
Allowance Price ($/Ton)	$24.77	$7.50	$2

For CY 2023, as in previous years, the evaluation team continued to obtain allowance prices for nitrogen oxide and sulfur dioxide emissions from the EPA's Cross-State Air Pollution Rule, most recently updated in 2023.[17] The team used the carbon dioxide emissions price in the PSC's Order, docket 5-FE-104, PSC REF#: 487366, which states, "For the purposes of evaluating Focus in Quad IV, a starting point market-based value of $24.77 per ton of avoided carbon emissions is reasonable and in the public interest."[18] Further, this value will increase by 7% in each year of Quadrennium IV.

The natural gas emissions factor has remained constant since the CY 2011 evaluation report and is derived from a best practice greenhouse gas inventory method developed by the California Energy Commission.[19]

Table 24 lists the total avoided emissions by gas type in tons for CY 2022 and CY 2023.

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17 U.S. Environmental Protection Agency. December 14, 2018. "Cross-State Air Pollution Rule." https://www.epa.gov/csapr

18 Public Service Commission of Wisconsin. June 6, 2018. Quadrennial Planning Process IV. Order PSC Docket 5-FE-104, REF#: 487366. https://apps.psc.wi.gov/ERF/ERFview/viewdoc.aspx?docid=487366

19 California Air Resources Board. 2019. *California Greenhouse Gas Emissions for 2000 to 2017.* https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2017/ghg_inventory_trends_00-17.pdf

Table 24. Total Emissions Benefits by Gas Type by Calendar Year

Year	Carbon Dioxide	Nitrogen Oxide	Sulfur Oxide
CY 2022 Tons of Emissions Avoided	6,241,182	3,003	4,008
CY 2023 Tons of Emissions Avoided	6,844,843	2,437	3,006

Table 25 lists the emissions benefits for all programs by segment for CY 2022 and CY 2023.

Table 25. Total Emissions Benefits by Segment by Calendar Year

Year	Residential	Nonresidential	Midstream [a]	Rural	Total [b]
CY 2022 Emissions Benefits	$24,980,488	$59,520,395	$737,740	$8,409,650	**$93,649,181**
CY 2023 Emissions Benefits	$20,901,895	$114,237,932	$7,894,761	N/A	**$168,421,243**

[a] The Midstream Program rebates both residential and nonresidential measures through a distributor-based delivery approach.

[b] Sector subtotals may not sum due to overlapping programs in rural and renewable categories.

4.5. 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 to be transfer payments to the customer.[20] Focus on Energy's fiscal agent, Wipfli, provided the CY 2023 program costs used for this evaluation.

Table 26 shows the CY 2022 and CY 2023 sector cost values used for the cost-effectiveness tests.

Table 26. Sector Costs Comparison by Calendar Year

Costs	CY 2022	CY 2023
Residential		
Incentive Costs	$23,475,533	$22,650,877
Administrative Costs	$1,258,964	$1,089,405
Delivery Costs	$12,604,191	$10,527,443
Total Residential Program Costs	**$37,338,688**	**$34,267,726**
Nonresidential		
Incentive Costs	$25,111,444	$28,712,721
Administrative Costs	$1,289,393	$1,632,259
Delivery Costs	$17,437,698	$20,066,587
Total Nonresidential Program Costs	**$43,838,535**	**$50,411,566**
Midstream		
Incentive Costs	$696,250	$3,744,005
Administrative Costs	$37,339	$180,821
Delivery Costs	$373,822	$1,760,187
Total Midstream Program Costs	**$1,107,411**	**$5,685,013**

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

Costs	CY 2022	CY 2023
Rural		
Incentive Costs	$4,084,339	N/A
Administrative Costs	$211,482	N/A
Delivery Costs	$2,714,450	N/A
Total Rural Program Costs	**$7,010,271**	N/A
Total		
Incentive Costs	$53,367,567	$55,107,604
Administrative Costs	$2,797,178	$2,902,485
Delivery Costs	$33,130,161	$32,354,216
Total Program Costs	**$89,294,906**	**$90,364,305**

4.6. Incremental Costs

The gross incremental costs are the additional costs incurred as a result of purchasing efficient equipment over and above a baseline nonqualified product. The evaluation team derived the gross incremental cost values used in this CY 2023 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 2019-CY 2022), the evaluation team assigned actual CY 2023 project costs from the program tracking databases to the renewable energy projects. Table 27 shows the CY 2022 and CY 2023 total measure net incremental costs used for the cost-effectiveness tests.

Table 27. Net Incremental Measure Cost Comparison by Calendar Year

Costs	Residential	Nonresidential	Midstream
CY 2022 Incremental Costs	$85,398,671	$124,229,177	$3,058,802
CY 2023 Incremental Costs	$93,683,658	$146,546,603	$6,383,948

Table 28 lists CY 2023 incentive costs by sector, with renewables incorporated.

Table 28. CY 2022 Incentive Costs by Sector (with Renewables Incorporated)

Costs	Residential	Nonresidential	Midstream	Total
Incentive Costs	$22,650,877	$28,712,721	$3,744,005	$55,107,604

Table 29 lists the findings of the benefit/cost analysis for Focus on Energy's CY 2023 programs by sector.

Table 29. CY 2023 Benefit and Costs Portfolio Breakout

Focus on Energy Benefits and Costs	Full Portfolio	Core Programs Alone	Renewables Alone
Incentives	$55,107,604	$49,209,627	$5,897,976
Modified TRC Benefits ($ millions)	$611,150,870	$499,518,470	$111,632,400
Modified TRC Costs ($ millions)	$281,870,910	$189,961,124	$91,909,786
Portfolio Modified TRC Ratio	**2.17**	**2.63**	**1.21**

Table 30 lists the findings of the benefit/cost analysis for Focus on Energy's CY 2022 programs by sector, with rural measures incorporated into each sector for each cost-effectiveness test.

Table 30. CY 2022 Costs, Benefits, and Modified Total Resource Cost Test Results by Sector

	Residential	Nonresidential	Midstream	Renewables	Total
Administrative Costs	$928,986	$1,486,583	$180,821	$306,095	$2,902,485
Delivery Costs	$8,977,238	$18,275,685	$1,760,187	$3,341,106	$32,354,216
Incremental Measure Costs	$47,450,233	$104,517,443	$6,383,948	$88,262,585	$246,614,209
Total Non-Incentive Costs	**$57,356,458**	**$124,279,711**	**$8,324,956**	**$91,909,786**	**$281,870,910**
Electric Benefits	$20,151,885	$152,392,706	$6,308,308	$69,024,714	$247,877,613
Gas Benefits	$36,558,418	$98,380,352	$13,468,326	-	$148,407,096
Emissions Benefits	$20,901,895	$114,237,932	$7,894,761	$25,386,655	$168,421,243
T&D Benefits	$4,368,286	$24,294,872	$560,731	$17,221,031	$46,444,919
Total TRC Benefits	**$81,980,483**	**$389,305,861**	**$28,232,126**	**$111,632,400**	**$611,150,870**
TRC Benefits Minus Costs	**$24,624,026**	**$265,026,150**	**$19,907,170**	**$19,722,614**	**$329,279,960**
TRC Ratio	**1.43**	**3.13**	**3.19**	**1.21**	**2.17**

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

Table 31 lists CY 2022 and CY 2023 portfolio cost-effectiveness results for the modified TRC.

Table 31. Cost-Effectiveness Results for Focus on Energy Portfolio by Calendar Year

Calendar Year	Residential	Nonresidential	Midstream	Renewables	Total
CY 2022: Modified TRC Test Result with Renewables	1.55	2.93	1.38	N/A	**2.36**
CY 2022: Modified TRC Test Result Renewables Excluded	1.80	3.06	1.38	1.36	**2.36**
CY 2023: Modified TRC Test Result with Renewables	1.10	2.77	3.39	N/A	**2.17**
CY 2023: Modified TRC Test Result Renewables Excluded	1.43	3.13	3.39	1.21	**2.17**

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, presented above, 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 societal test has the same inputs as the expanded TRC, plus non-energy benefits.

Table 32 lists the CY 2023 portfolio-level cost-effectiveness results for these additional test perspectives.

Table 32. CY 2023 Portfolio-Level Cost-Effectiveness Results for Additional Benefit/Cost Tests

Test	Residential	Nonresidential	Midstream	Renewables	Total
Expanded TRC					3.75
UAT	2.09	5.99	3.58	9.04	4.90
Societal Test	2.07	3.50	4.06	1.30	4.08

The inclusion of economic benefits in the expanded TRC produces higher benefit/cost ratios compared with the portfolio-level modified TRC results. For the UAT, the results show that benefits from the residential programs are just more than twice the costs, while the benefits from the nonresidential programs outweighed the costs by a factor of nearly six. The societal test delivered benefits just above four times the costs.

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 I. Cost-Effectiveness and Emissions Methodology and Analysis in Volume III as well as the Benefit/Cost Analysis CY 2009 Evaluation Report.[21]

[21] 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

5. Key Performance Indicators Achievement

The program administrator's contract requires the evaluation team to assess and report findings from five KPIs at various points throughout Quadrennium IV. Those KPIs are related to achieving MMBtu goals, maintaining high customer satisfaction, ensuring equity of incentive spending across investor-owned utilities, increasing the number of applications from income-qualified customers, and ensuring rural customers receive a proportional share of incentives. For each KPI, the administrator is eligible to receive a higher bonus amount for meeting higher KPI thresholds. For certain KPIs, the program administrator is subject to financial penalties for failure to achieve minimum performance thresholds.

In CY 2023, the evaluation team verified KPIs related to customer satisfaction and rural incentive spending since the program administrator is eligible for a performance bonus for both KPIs based on CY 2023 verified results. Table 33 presents a brief description of each KPI, the KPI target thresholds, and the evaluation team's verification findings.

Table 33. Quadrennium IV Key Performance Indicators and Verified Results

KPI	Description	KPI Target Thresholds	Verified Results
Customer Satisfaction	Maintain high customer satisfaction at the portfolio level	50% of bonus ≥9.0 75% of bonus ≥9.1 100% of bonus ≥9.2	Participation-weighted average satisfaction across the portfolio was 9.4 in CY 2023
Rural Incentive Spend	Ensure that incentives paid to rural customers are proportional to the percentage of rural customers in the state	50% of bonus ≥31% 75% of bonus ≥32% 100% of bonus ≥33%	Rural incentives accounted for 34.7% of all incentives disbursed in 2023.

6. Outcomes and Recommendations

Based on the evaluation team's findings, this section presents high-level outcomes and recommendations. The team synthesized information from all CY 2023 evaluation activities to inform the following portfolio-level outcomes and recommendations. More information on supporting findings can be found in this report and in the program chapters in Volume II.

Outcome 1. Participants continue to report high levels of satisfaction with Focus on Energy offerings. Overall, CY 2023 respondents gave the offerings they participated in an average satisfaction rating of 9.4, consistent with average ratings of 9.5 or 9.4 for the portfolio every year since CY 2020. Every program surveyed in CY 2023 had an average customer satisfaction rating of at least 9.2.

6.1. Residential

Outcome 1. Insights from CY 2023 Heating and Cooling contractor surveys and trade ally interviews can help Focus on Energy successfully transition the Heating and Cooling offering to the Instant Discount Program in CY 2024. Contractors and distributors shared a wealth of feedback about the HVAC market, participation barriers, the current program's impact on the market, and how program incentives can most effectively boost sales of high-efficiency equipment. Contractor and distributor opinions aligned on some topics and disagreed on others, suggesting that new program design and roll-out plans should address differing priorities between the two types of trade allies.

Recommendation 1. As Focus on Energy finalizes the program design and roll-out plan for the Heating and Cooling offering of the Instant Rebate Program, it should consider the valuable insights summarized in the Trade Ally Solutions chapter of Volume II. Addressing and incorporating this feedback could help ensure trade ally support is integral to the new program design, maximize participation, and set up successful evaluations in future years.

Outcome 2. For Residential New Construction, an increasing share of higher-efficiency program homes and continued market effects savings resulted in high NTG ratios for the program in CY 2023. Evaluation research conducted in Quadrennium III found higher NTG ratios for program homes built to higher certification levels. In CY 2023, program homes continued to be more efficient than homes built in previous years, which resulted in a program home natural gas NTG ratio of 18% for CY 2023, compared to 5% used during the last quadrennium. (The electric NTG did not change from the last quadrennium.)

In Quadrennium III, the evaluation team also quantified market effects savings, which reflect how the program's long-standing presence in the new construction market induced savings in nonprogram homes. Like previous years, market effects realized in CY 2023 are new, program-induced savings that have not previously been attributed to the program. Combining market effects savings with the updated program home NTG ratio resulted in an overall NTG ratio of 116% for the CY 2023 program, weighted by annual MMBtu savings.

6.2. Nonresidential

Outcome 1. Deviations found in a small number of high-impact hybrid measures in the Agribusiness and Large Industrial Programs drove the realization rates for those programs. While hybrid measures do not necessarily warrant the same level of implementer review as custom projects, variability in post-installation operations of large projects can greatly impact overall program realization rates when the projects are impactful enough to drive realization rates on their own (census sampled), as well as when extrapolated across the population (randomly sampled).

Recommendation 1. Programs should target post-installation verification activities for larger custom measures and hybrid measures with input parameters that are not provided in the TRM, particularly on equipment that can be easily trended by the customer. Ensure trends are set up during equipment installation so that data can be readily gathered post-installation to verify the *ex ante* savings calculation parameters (e.g., variable-frequency drive speed trends to determine loading patterns or compressed air system CFM, pressure, and run hours).

Outcome 2. The evaluation team identified multiple instances of project data discrepancies in EDA/EDR measures, leading to realization rates that varied from 100%. Verification report specifications often differed from model input parameters for several EDA/EDR projects. This created uncertainty for the evaluation team concerning whether the documentation or the model had not been properly updated and which should be considered the most current.

Recommendation 2. Programs should consider enacting or formalizing a quality control process for aligning verification reports with the energy model inputs and outputs.

Outcome 3. Several factors created discrepancies between *ex ante* and verified savings for nonresidential projects. Many of the issues cited in the CY 2021 and CY 2022 evaluations and corresponding recommendations still apply to CY 2023.

Recommendation 3. Please review the table below for recommendations.

CY 2020-22 Conclusion (Summary)	CY 2020 Recommendation (Summary)	CY 2021 and CY 2022 Recommendation	CY 2023 Recommendation
Some large and complex projects lacked detailed savings calculations, reporting, and data collection, which caused discrepancies with verified savings, particularly when the evaluation team used power metering to gather data on the site.	Provide a 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 report, in which the implementer details the methodologies used and assumptions made to calculate savings. The evaluation team also recommends writing a verification report, in addition to the verification sheet, in which assumptions in the technical analysis summary report are verified, pictures and invoices collected, and any project changes accounted for. Whenever possible, include any meter or trend data in the analysis.	**Same as CY 2020.** The evaluation team recommends a more comprehensive review and analysis of project savings for large custom projects that could be more complex and variable than usual. Develop a standard protocol for developing savings estimates for these types of projects. This should also include a standard list of documentation required, such as project descriptions, invoices, photos, a list of assumptions, etc. Suggested protocol elements are presented in the recommendations for the Business and Industry Program.	**Same as CY 2020 - 2022.** The evaluation team recommends developing an approach that uses trend data, utility billing data, and metering data as available. The team also recommends grounding assumptions by referencing best practices, taking spot measurements, and using actual weather data from the location of projects.

Outcome 4. For the Renewable Rewards Program, the TRM's deemed savings approach continues to capture most array orientations in solar PV installations for residential and business participants. However, larger and more complex business installations require a custom analysis to accurately capture all savings generated. During the CY 2023 evaluation desk reviews, the team found that the two largest solar PV projects in the Business offering were installed with tracking systems, which optimize array tilt and energy production throughout the day. The 2023 TRM does not currently account for tracking capabilities on solar PV installations, which could result in a significant underestimation of project savings for larger solar installations like the two projects referenced above.

Recommendation 4. Consider updating the TRM to include a direct current capacity threshold at which project savings are calculated in PV Watts on a per-project basis, assuming as-built array conditions and specifications for inputs. For future projects, the program administrator, implementers, and evaluator should develop a threshold for when to use as-built conditions to calculate savings.

Outcome 5. Nonresidential customers often work closely with contractors to initiate projects, but customers rarely work with contractors to identify additional energy efficiency projects.

Recommendation 5. Leverage the existing relationships between trade allies and customers to drive additional program participation beyond a single project. For example, provide trade allies with tools and information related to other program opportunities, such as a brochure of Focus on Energy services for nonresidential customers or a postcard directing customers to the appropriate pages on the Focus

on Energy website. Also, consider offering a referral incentive to trade allies who successfully encourage customers to pursue energy-saving projects for measures outside of their purview.

Outcome 6. To simplify and increase the transparency of the application process, trade allies recommended a web-based application portal. After increased incentives, trade allies most frequently mentioned an online application portal as an opportunity for program improvement. While trade allies and customers were both generally satisfied with the current application process, trade allies frequently said they rely on energy advisors for assistance to complete program applications.

Recommendation 6. Explore options for adopting an online application portal. This may help trade allies complete more applications themselves while simultaneously providing them with greater insight into the status of their current projects and the program overall. Review portals by other program administrators and engage with trade allies and energy advisors to identify specific information that could potentially reduce the amount of time that trade allies and energy advisors spend assisting with applications.

6.3. Midstream

Outcome 1. CY 2023 contractor surveys and distributor interviews provided helpful insight into how the CY 2023 Midstream Program design impacted participating trade allies and where program changes could improve trade ally satisfaction. Contractors and distributors also provided feedback about awareness and the incentive design, which could be helpful as Focus on Energy transitions to the new Instant Discount Program.

Recommendation 1. Review trade ally feedback summarized in the Midstream chapter of Volume II and consider how to integrate this feedback into designing the new Instant Discount Program in CY 2024.

Outcome 2. Lessons learned about how kits are distributed through the Community-Based Organization offering could help the program redesign kit contents and distribution guidelines to better serve the targeted population. Interviews with CBO partners provided a first in-depth look at how CBOs distribute program kits and how customers respond to the kits. While some CBO partners said they distribute kits as intended in program guidelines (distributing free kits with each participant receiving a limited number of kits), others said they adjusted distribution based on the needs of the people they are serving or based on their organization's needs. Some of these adjustments included selling kits at a nominal cost or allowing customers to take multiple kits because they needed more of a specific measure in the kit (namely, window film).

Recommendation 2. Consider redesigning current kit contents or offering additional free measures to better meet customers' needs. This could be done by including a promotion code to the online store in the weatherization kits that allows customers to request additional window coverings and other weatherization measures for free. By offering individual measures, instead of a kit, the program could help ensure customers are only taking measures that they will install and will be useful to them, rather than taking a whole kit for one measure and not installing the remaining measures.

6.4. Cost-Effectiveness

Outcome 1. The Residential, Nonresidential, Midstream, and Renewable portfolios all passed the modified TRC test, as they have in every year of the previous quadrennium. While the overall portfolio's cost-effectiveness ratio dropped slightly between CY 2022 to CY 2023, the portfolio itself remains stable and highly cost-effective in CY 2023, delivering $2.17 in benefits for each dollar spent. When accounting for downstream economic benefits, the portfolio is even more effective, delivering $3.75 per dollar spent. When including non-energy benefits through the societal test, the program delivers $4.08 per dollar spent. However, there was a substantial drop in savings for residential programs between CY 2022 and CY 2023, primarily because of the substantial removal of Energy Independence and Security Act-regulated screw-in LED lamps, the shifting of some highly cost-effective pack measures to the Midstream CBO offering, and the expansion of residential solar PV measures, which have high incremental measure costs per kWh savings. This, combined with lower electricity-related avoided costs, led to a decrease in the Residential Portfolio's modified TRC from 1.80 to 1.43.

Recommendation 1. Continue to monitor which residential measures and program designs return the highest cost-effectiveness and consider shifting resources into those channels.