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July 22, 2024

VIA ELECTRONIC MAIL ONLY
Clerk of Council
City Hall - Room 1E0
1300 Perdido Street
New Orleans, LA 70112

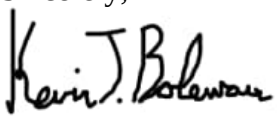
Re: Filing of Entergy New Orleans, LLC's Energy Smart Program Year 13 Annual Report and Evaluation, Measurement and Verification Report (Resolutions R-11-52, R-22-523; UD-08-02, UD-20-02, UD-23-01)

Dear Clerk,

On February 3, 2011, the Council of the City of New Orleans ("Council") adopted Resolution R-11-52 requiring periodic reports regarding Energy Smart to be filed with the Council. Resolution R-22-523, adopted on December 15, 2022, approved the continuance of Energy Smart for Program Years 13 and 14. Council Resolution R-22-523 further approved APTIM, Environmental and Infrastructure ("APTIM") and Honeywell Smart Energy ("Honeywell") as the Third-Party Administrators, and ADM Associates, Inc. as the Third-Party Evaluator.

On behalf of APTIM, Honeywell and ADM, Entergy New Orleans, LLC submits this Energy Smart Program Year 13 Annual Report and Annual Evaluation, Measurement and Verification Report for the period of January 1, 2023 to December 31, 2023 and requests that you file this submission in accordance with Council regulations. Should you have any questions regarding this filing, please contact my office at (504) 670-3680.

Sincerely,



Kevin T. Boleware

Enclosure

cc: Official Service List UD-08-02, UD-20-02 and UD-23-01 *(via electronic mail)*

Annual Report

Energy Smart

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ENERGY STAR AWARD 2023
PARTNER OF THE YEAR
Sustained Excellence

Program Year 13

January 1-December 31, 2023

Table of Contents

Executive Summary

The Energy Smart Program (Program) was developed by the New Orleans City Council (Council), is administered by Entergy New Orleans, LLC (ENO) and is implemented by APTIM, the Third-Party Administrator (TPA). This report contains performance data and activities for the Program period of January 1, 2023 - December 31, 2023. This report contains data on the Program and evaluation results from ENO's Third-Party Evaluator's (TPE) Evaluation, Measurement and Verification (EM&V) report. This report includes verified gross savings and net savings.

To ensure success in current and future programs, APTIM and ENO have engaged several subcontractors with extensive experience in energy efficiency programs and in the New Orleans market to implement the program, including:

- ILSI Engineering
- Legacy Professional Services
- Spears Consulting
- Green Coast Enterprises
- Energy Wise Alliance
- Franklin Energy Services
- EnergyHub
- Harris Energy Solutions
- Honeywell
- MD Energy Advisors
- Urban League of Louisiana
- Sagewell
- National Theatre for Children (NTC)

This report contains data on the Energy Smart program offerings, including:

- A summary of activities by offering;
- kWh savings achieved, kW reduction and incentives spent;
- Marketing, outreach, and engagement;
- Training and workforce development activities; and
- Supplier diversity highlights.

Staff List

Name	Title	Company	Location
Dan Reese	Director of Energy Programs	APTIM	Portland, OR
Megan Sykes	Marketing Manager	APTIM	Baton Rouge, LA
Michelle Krueger	Program Director	APTIM	New Orleans, LA
John Krzystowczyk	Commercial Program Manager	APTIM	New Orleans, LA
Dawn Ellerd	Marketing & Outreach Lead	APTIM	New Orleans, LA
Reagan Gill	Marketing Communications Specialist	APTIM	Dallas, TX
Kevin Fitzwilliam	Training & Development Specialist	APTIM	New Orleans, LA
Spencer Kurtz	Energy Engineer	APTIM	Charlotte, NC
Hunter Lebow	Data Analyst	APTIM	New York City, NY
Michael Slaughter	Finance	APTIM	Baton Rouge, LA
Katie Nash	Operations Manager	APTIM	Pearl River, LA
Nick Bengtson	Sales Executive	EnergyHub	Brooklyn, NY
Nathan Meadows	Client Success Manager	EnergyHub	Brooklyn, NY
Jamie Wine	Director	Energy Wise Alliance	New Orleans, LA
Meredith Seale	Education Coordinator	Energy Wise Alliance	New Orleans, LA
Brandon Muetzel	Community Outreach Manager	Energy Wise Alliance	New Orleans, LA
Nate Wolf	Residential Program Manager	Franklin Energy Services	New Orleans, LA
Amber Lindh-Porcaro	Residential Program Manager, Retail	Franklin Energy Services	Milwaukee, WI
Alan Mitchell	Field Manager	Franklin Energy Services	New Orleans, LA
Amanda Welch	Operations Analyst	Franklin Energy Services	Milwaukee, WI
Kathryn Piacentino	Client Marketing Manager	Franklin Energy Services	Rochester, NY
Melissa Carlson	Client Marketing Manager	Franklin Energy Services	Chicago, IL
Wendy Becker	Outreach Manager	Franklin Energy Services	Milwaukee, WI
Daniel Franklin	Operations Manager	Franklin Energy Services	New Orleans, LA
James Herman	Operations Analyst	Franklin Energy Services	New Orleans, LA
Dwayne Haley	Energy Advisor	Franklin Energy Services	New Orleans, LA
Jackie Dadakis	Chief Operating Officer	Green Coast Enterprises	New Orleans, LA
Joe Ryan	Director of Energy Services	Green Coast Enterprises	New Orleans, LA
John Eskew	Energy Management Specialist	Green Coast Enterprises	New Orleans, LA
Ben Meyers	Benchmarking Associate	Green Coast Enterprises	New Orleans, LA
Jessica Harris	President	Harris Energy Solutions	Austin, TX
Deng Lin	Director	Harris Energy Solutions	Austin, TX
Craig Henry	Demand Response Program Manager	Honeywell Smart Energy	San Antonio, TX
Benjamin Cavell	ADR Outreach Manager	Honeywell Smart Energy	New Orleans, LA
Iam Tucker	President & CEO	ILSI Engineering	New Orleans, LA
Keeley Evans	Project Specialist	ILSI Engineering	New Orleans, LA
Gill Page	Energy Engineer	ILSI Engineering	New Orleans, LA
Alcide Tervalon III	Principal	Legacy Professional	New Orleans, LA
Iryell Richard	Small Commercial Project Coordinator	Legacy Professional	New Orleans, LA
Denzel Harry	Energy Advisor	Legacy Professional	New Orleans, LA
Louis Bart	Energy Advisor	Legacy Professional	New Orleans, LA
Jacob Pohlman	Residential QA/QC	Legacy Professional	New Orleans, LA
Derrick Hammond	Energy Advisor	Legacy Professional	New Orleans, LA

Larry Tervalon	Energy Advisor	Legacy Professional	New Orleans, LA
Vindocto Torns	Energy Advisor	Legacy Professional	New Orleans, LA
Brandon Barbre	Energy Advisor	Legacy Professional	New Orleans, LA
Wilbert Curtis	Recycling Specialist	Legacy Professional	New Orleans, LA
Ethan Cartwright	Energy Advisor	MD Energy Advisors	New Orleans, LA
Layne Carroll	Energy Advisor	MD Energy Advisors	New Orleans, LA
Reilly Cavanaugh	Energy Advisor	MD Energy Advisors	New Orleans, LA
Cleveland Spears	President/CEO	Spears Consulting	New Orleans, LA
Meredith Adams	Account Executive	Spears Consulting	New Orleans, LA
Klassi Duncan	VP Entrepreneurship & Innovation	Urban League	New Orleans, LA
Cherie Duckworth	VP of Workforce Development	Urban League	New Orleans, LA
Turi Clark	Client Success Manager	NTC Corporate	Minneapolis, MN
Marvin Martin	Leader, Business Development	NTC Corporate	Minneapolis, MN
Nikki Swoboda	Director, Marketing	NTC Corporate	Minneapolis, MN
Gary Smith	President	Sagewell, Inc.	Charlotte, NC
Josh Cantor	Energy Analyst	Sagewell, Inc.	Boston, MA
Jim Sheehan	Senior Data Analyst	Sagewell, Inc.	Boston, MA

Offerings Overview

Residential

Energy Efficiency

- Home Performance with ENERGY STAR®
- Retail Lighting & Appliances
- Income-Qualified Weatherization
- A/C Solutions
- Multifamily Solutions
- Appliance Recycling & Replacement Pilot
- School Kits & Education
- Behavioral Energy Efficiency

Demand Response

- EasyCool, Bring Your Own Thermostat (BYOT)
- Peak Time Rebate Pilot
- Residential Battery Energy Storage Pilot
- EV Charging DR, Bring Your Own Charger (BYOC)

Commercial & Industrial

Energy Efficiency

- Small Commercial & Industrial Solutions
- Large Commercial & Industrial Solutions
- Publicly Funded Institutions
- Commercial & Industrial Construction Solutions

Demand Response

- Large Commercial & Industrial Automated Demand Response (ADR)

PROGRAM PERFORMANCE & ACTIVITY

Program Performance and Activity

Table 2.1

	kWh SAVINGS	kWh GOAL*	% TO GOAL	kW SAVINGS	kW TARGET*	% TO TARGET	INCENTIVES	BUDGET	% TO BUDGET
Commercial & Industrial - Energy Efficiency	26,483,615	54,247,606	49%	4,068.00	8,639.00	47%	$2,978,545	$6,367,571	47%
Commercial & Industrial - Demand Response	72,445	N/A	N/A	3,019.95	6,970.00	43%	$208,581	$418,200	50%
Residential - Energy Efficiency	41,729,203	50,370,779	83%	7,521.32	3,507.00	214%	$5,517,666	$6,919,833	80%
Residential - Demand Response	-	-	N/A	4,314.23	10,974.00	39%	$256,413	$450,875	57%
Total	**68,285,264**	**104,618,385**	**65%**	**18,923.50**	**30,090.00**	**63%**	**$8,961,205**	**$14,156,479**	**63%**

** Goals are reflective of the Energy Smart Implementation Plan PY13-15.*

Summary tables show savings achieved and incentive spend from January 1, 2023 through December 31, 2023.

Table 2.2

GROSS DEMAND REDUCTION (kW)	GROSS ANNUAL ENERGY SAVINGS (kWh)	TOTAL PROGRAM EXPENDITURES	TRC (B/C RATIO)	UCT (B/C RATIO)
18,923.50	68,285,264	$18,678,943	1.23	1.26

Residential Summary

The Residential Portfolio achieved 41,729,203 in verified gross kWh savings reaching 83% of the goal while spending 80% of the incentive budget. The Income Qualified Weatherization (IQW) offering exceeded the energy savings target, reaching 114% of goal. Additionally, the Multifamily Solutions and A/C Solutions offerings exceeded kWh savings goals, reaching 111% and 124%, respectively. Home Performance with ENERGY STAR® achieved 101% and Retail Lighting and Appliance achieved 87% of goal. Retail Lighting was directly impacted by the Energy Independence and Security Act (EISA), which eliminated LED savings from point of purchase sales after the enforcement date of July 1, 2023.

Energy Smart community outreach was conducted at over 109 events, gaining visibility with over 17,000 community members. The team offered flexible content options to community groups, ranging from information tables, five-minute briefings to 60-minute energy efficiency lessons for maximum community impact. Community partners were critical to provide energy education and lead generation for the Residential Portfolio offerings. Vietnamese Initiative in Economic Training (VIET), Total Community Action and AmeriHealth all worked with the Energy Smart team in PY13 to engage Entergy New Orleans customers. These relationships helped build trust with the members of their networks and allow customers to access energy efficiency rebates with Energy Smart. The program team continued to use kits and LED giveaways at community events to increase customer awareness, generate participation, and create additional kWh savings.

In PY13, the Energy Smart team partnered with The Estates, a complex of homes with the Housing Authority of New Orleans and supported 386 customers in the Income Qualified Weatherization offering. Residents of The Estates experienced high energy burden, with large square footage units to heat and cool. The Energy Smart direct installation equipment and weatherization measures totaled over 1.3 million kWh in energy savings, providing an average savings of 3,452 kWh per customer and an estimated annual bill savings of almost $350.

Entergy New Orleans earned the 2023 ENERGY STAR® Partner of the Year Sustained Excellence Award from the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE). This award honored the Energy Smart program for its outstanding contributions to protecting the environment through superior energy achievements. This marks the seventh time since 2014 that Entergy New Orleans has been recognized by the EPA and DOE for its energy efficiency efforts.

Commercial & Industrial Summary

The Commercial & Industrial (C&I) Portfolio achieved 26,556,060 kWh in verified gross kWh savings and reached 49% to the goal, while spending 47% of the incentive budget. A delay in program approval in 2022 negatively impacted Energy Smart's ability to pre-approve projects with an estimated completion date in PY13 which significantly impacted the C&I pipeline in PY13. Large Commercial & Industrial projects and Construction Solutions projects that generally have long implementation timelines were unable to participate in the program and Energy Smart began the year with a significantly lower commercial pipeline than in previous program years.

Energy Smart trade allies were surveyed at the beginning of the year to determine planned program participation in PY13 and to provide input for current participation barriers. Trade allies indicated plans to submit all eligible projects to the program, however a common theme continued to be challenges with staffing and the ability to complete customer outreach to identify projects. In response to the decreasing number of trade ally-initiated projects, the Energy Smart team increased outreach and marketing strategies to engage customers directly and identify energy saving projects in their businesses.

The commercial program team received over 230 customer inquiries via the Energy Smart website requesting assistance identifying energy saving measures and assistance applying for program

incentives for their energy efficiency project. The Energy Smart team significantly increased Energy Advisor program staff dedicated to commercial customer engagement and application assistance in PY13 to remove barriers to program participation for both small and large customers. The increase in customer-initiated projects also served to identify contractors performing work in Orleans Parish that were not previously Energy Smart trade allies, assisting with recruitment efforts to expand implementation options for customers.

In PY13 the Energy Smart commercial outreach team conducted customer outreach with 360 large and small commercial customers. Customers were comprised from a segment mix of hotels, universities, city government, economic development organizations, industrial service providers, contractors/real estate developers, food and beverage and retail stores.The Energy Smart team participated in three Love Your City Keep It Clean NOLA events in PY13 including speaking as a panelist at an Impact Officer Roundtable, panelist at the campaign Kick-Off and one of three presenters at the Keep It Clean NOLA Happy Hour for small businesses.

Public Awareness Campaign

The Public Awareness campaign was in market May 1 – December 31, 2023. The goal of the campaign was to utilize high-impact media tactics to drive awareness of the programs savings-benefits and increase participation amongst residential and business customers. A focused targeting strategy was implemented. Media placement and messaging was placed within 11 zip codes identified as areas with customers having severe energy burdens. The 11 zip codes targeted were: 70126, 70127, 70129, 70117, 70116, 70119,70112, 70125, 70113, 70115, 70114.

The campaign launched with static branding ads aligning Energy Smart programs with saving customers money. After 30 days in market, animation was added to the digital ads which resulted in a month over month click rate increase of 20%. In mid-July, program specific ads for appliance recycling, EasyCool and business customers were introduced. These program specific ads had the highest engagement by customers throughout the campaign period at 1,211 clicks. In early October, a creative update was implemented with new appliance recycling ads and generic brand ‘kick-off savings’ ads to incorporate local seasonal trends. The appliance recycling program reached the milestone of 100 recycles during this time. In early November, the Energy Smart team reallocated impressions with 60% targeting the business segment and 40% targeting residential customers. This shift in impressions resulted in making the Public Awareness campaign the top traffic source for the business page during the period of November through December, with 127% more users going to the business page than realized through previous efforts.

Outdoor bulletins and posters were strategically positioned in high traffic areas in and near the target zip codes. The out of home (OOH) placements consisted of five 14’x48’ digital bulletins that rotate throughout 14 locations in the city and four 10’x21’ digital posters that are in fixed locations. Two are adjacent to the University Medical Center and the other two are targeting people entering and leaving the French Quarter and Central Business District. Transit advertising in the form of bus shelter posters were in the targeted zip codes while bus kings and a high impact bus wrap covered the New Orleans RTA network.

Digital media was segmented into two tactics, device ID targeting and dominant display ad banners. Device ID delivered ads specifically to Energy New Orleans customers mobile devices visiting discount grocery, dollar stores, community assistance centers and Entergy Care center locations to reach disadvantaged customers. Dominant display ads were delivered based on content, search retargeting, and customer demographics, behavior and geography.

The campaign was a success. Total campaign impressions of 234,921,056, surpassed the goal of 229,860,000 - a difference of 45,571,670 impressions with a media value of $43,800. Website traffic

increased 162%, digital media click-thru-rate was twice the national average and 1,593 users explored the website after seeing an Energy Smart ad and 645 explored the site further after clicking an ad. The best performing creative was the “Amp Up Your Savings” business targeted ad, generating 379 clicks. This campaign also received a prestigious Platinum MARCOM Award. MARCOM Awards recognize excellence in marketing and communication while recognizing the creativity, hard work and generosity in industry professionals.

Table 2.3: Outdoor Billboards

DATE	TOTAL IMPRESSIONS	IMPRESSIONS OVER KPI
May 8 – December 31	54,956,884	22,956,884

Table 2.4 Transit

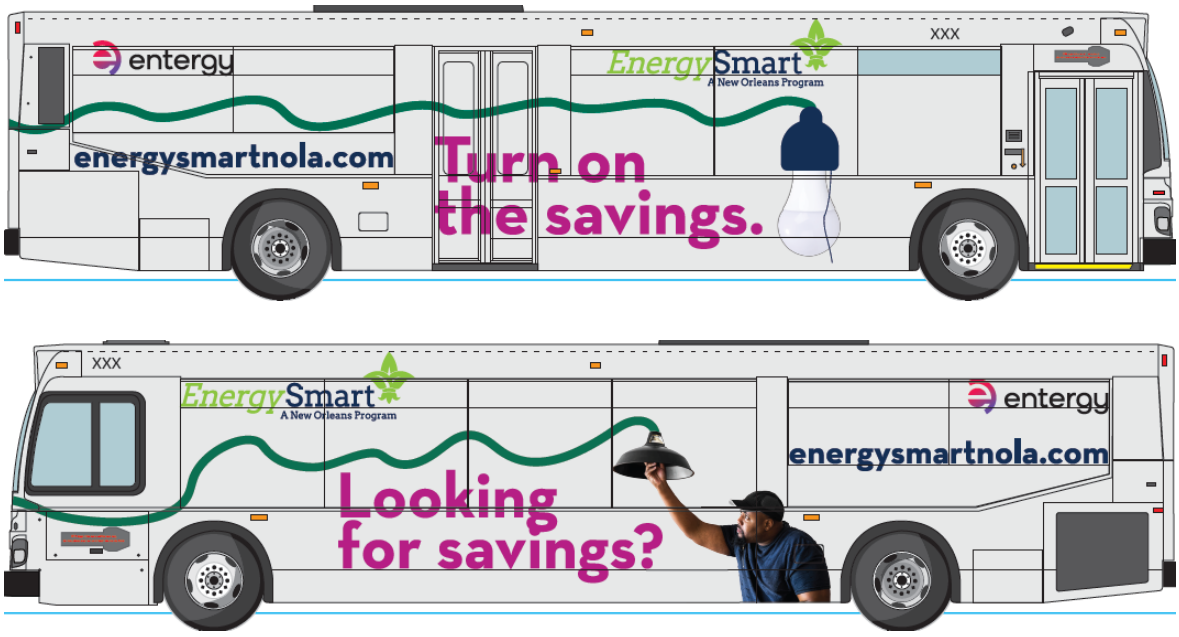
DATE	TOTAL IMPRESSIONS	IMPRESSIONS OVER KPI
May 8 – December 31	176,847,000	21,897,614

Table 2.5: Digital Ads

DATE	TOTAL IMPRESSIONS	IMPRESSIONS OVER KPI	CLICKS	CONVERSIONS
May 1 – December 31	3,117,172	717,172	4,225	2,238

Table 2.6: Website Page Views

WEBSITE PAGES	# OF VIEWS	REPORTING PERIOD
Energy Smart Home Page	14,540	August - December
Energy Smart Business Page	12,591	August - December
Energy Smart Residential Page	11,897	August - December
Energy Smart Small Business Energy Assessment Page	5,087	August - December
EasyCool Smart Thermostat Page	4,740	August - December



RESIDENTIAL OFFERINGS

Residential Portfolio Performance

Table 3.1

RESIDENTIAL OFFERING	kWh SAVINGS	kWh GOAL*	% TO GOAL	kW SAVINGS	kW GOAL*	% TO GOAL	INCENTIVES	BUDGET	% TO BUDGET
Home Performance with ENERGY STAR	16,643,910	16,461,506	101%	1,014.48	883	115%	$1,446,570	$1,929,175	75%
Retail Lighting & Appliances	6,926,676	7,997,811	87%	1,057.33	1,110	95%	$634,564	$1,143,327	56%
Multifamily Solutions	2,971,658	2,678,475	111%	769.32	142	542%	$717,113	$677,241	106%
Income Qualified Weatherization	4,355,709	3,817,679	114%	1,986.43	108	1,839%	$1,971,880	$1,850,412	107%
A/C Solutions	3,538,524	2,848,496	124%	1,498.68	1,239	121%	$568,439	$999,341	57%
Appliance Recycling & Replacement	113,457	1,701,810	7%	14.10	25	56%	$85,100	$221,737	38%
School Kits & Community Outreach	712,976	797,088	89%	89.86	N/A	N/A	$94,000	$98,600	95%
Behavioral Energy Efficiency	6,466,294	14,067,914	46%	1,091.12	N/A	N/A	$0	$0	N/A
EasyCool BYOT	0	N/A	N/A	3,984.08	9,600	42%	$230,725	$355,000	N/A
Peak Time Rebate Pilot	0	N/A	N/A	200.46	714	28%	$12,880	$48,275	27%
EV Charging Pilot	0	N/A	N/A	49.42	525	9%	$3,458	$29,100	12%
Residential Battery Pilot	0	N/A	N/A	80.27	135	59%	$9,350	$18,500	51%
Total	**41,729,203**	**50,370,779**	**83%**	**11,835.55**	**14,481**	**82%**	**$5,774,079**	**$7,370,708**	**78%**

**Goals are reflective of the Energy Smart Implementation Plan PY13-15.*

Home Performance with ENERGY STAR®

Offering Description

This offering will achieve long term, significantly cost-effective electric savings through the use of local auditors and contractors who will help residential customers analyze their energy use and identify opportunities to improve efficiency, install low-cost energy-saving measures, and identify and implement more comprehensive home efficiency projects. The offering includes a home energy assessment which may also recommend follow up measures to be completed by trade ally contractors. The home energy assessment includes a walk-through inspection and direct installation of low-cost measures such as LED lighting, high-efficiency showerheads and water aerators, smart power strips, pipe wrap and smart thermostats. The home energy assessment may recommend follow-up measures which require diagnostic testing to achieve deeper savings in the home. Follow-up measures, completed by an Energy Smart approved trade ally, include attic insulation, air conditioning tune-up, air sealing, and duct sealing. This offering also includes an energy- saving kit component offered through the Online Marketplace, which provides an easy customer entry point.

To meet the needs of New Orleans' unique housing stock of double shot-gun homes and smaller multifamily configurations, the Home Performance offering includes all buildings with four or fewer units. Structures of this size and construction type often behave and function more like single-family homes, with owners often occupying one of the units, thus minimizing the split-incentive barrier.

Offering Highlights

The Home Performance with ENERGY STAR offering achieved 16,643,910 in verified kWh savings, reaching 101% of the goal. The Energy Smart team completed 808 assessments during the year and generated 32% of the home energy assessment savings from direct-install measures. Deeper savings measures completed by the trade allies, which include attic insulation, air sealing and duct sealing, generated 68% of the savings. This measure mix allowed the offering to produce an average of 2,268 kWh per customer.

LED Lighting kits were mailed to 24,737 customers while another 1,578 Online Marketplace kits were ordered by customers, both of which were used to create program leads and generate low-cost savings. The kits were mailed to customers who have never participated in the HPwES or Income Qualified Weatherization program offerings to encourage them to schedule their free home energy assessment. The kits generated 15,471,432 kWh this was a critical adjustment to maximize savings when EISA impacted the lighting savings starting July 1, 2023.

The Department of Energy recognized the Energy Smart Program as an ENERGY STAR Partner of the Year, Sustained Excellence, for the third consecutive year for its exemplary commitment and dedication to energy efficiency.

- A total of 217,845 measures were installed during the program year.
- A total of 26,315 kits were shipped in PY13.
- The offering reached 101% of the kWh goal, achieving 16,643,910 kWh.
- The offering reached 115% of the kW target, achieving 1,014.48 kW.

Offering Budget and Savings

Table 4.1

MEASURE	COUNT OF MEASURES	GROSS kWh SAVINGS	% OF kWh CONTRIBUTION
1.0 Bathroom Aerator	57	2,226	0.0%
1.0 Bathroom Aerator – Pull Kit	1,562	16,473	0.1%
1.5 Kitchen Aerator	49	1,145	0.0%
1.5 Kitchen Aerator – Pull Kit	1,562	9,884	0.1%
1.5 Showerhead	81	17,270	0.1%
1.5 Showerhead – Pull Kit	1,562	93,772	0.6%
Air Infiltration	257	349,107	2.1%
Assessment	808	0	0.0%
Attic Insulation	18	41,427	0.2%
Duct Sealing	368	872,593	5.2%
LED Lamp 9W (A Type)	2,540	72,791	0.4%
LED Lamp 8W (Flood)	94	3,990	0.0%
LED Lamp 6W (Globe)	268	7,559	0.0%
LED Lamp 5W (Candelabra)	1,795	53,920	0.3%
LED Lamp 15W (Outdoor/PAR38)	303	63,754	0.4%
LED Lamp 15W (Outdoor/A Type)	37	8,068	0.0%
LED Lamp 11W (Flood)	1,034	47,347	0.3%
LED Lamp 11W (A Type)	272	9,764	0.1%
Pull Kit - LED Lamp 9W (A Type)	4,686	87,156	0.5%
Pull Kit - LED Lamp 15W (A Type)	1,562	48,705	0.3%
Push Kit - LED Lamp 13W (A Type)	24,737	4,292,688	25.8%
Push Kit - LED Lamp Kit 15W (PAR38)	49,474	8,003,317	48.1%
Push Kit - LED Lamp Kit 9W (A Type)	123,685	2,268,575	13.6%
Pipe Insulation	53	5,015	0.0%
Smart Thermostats	137	46,774	0.3%
Advanced Power Strip (Tier 2)	844	220,590	1.3%
TOTAL	217,845	16,643,910	100%

Table 4.2

COST			ENERGY SAVINGS (kWh)			DEMAND REDUCTION (kW)		
Spend	Budget	%	Pre-Evaluated	Evaluated	%	Pre-Evaluated	Evaluated	%
$1,446,570	$1,929,175	75%	17,302,866	16,643,910	96%	1,015.77	1,014.48	100%

Table reflects verified gross energy savings achievement from TPE's Evaluation, Measurement and Verification (EM&V) findings relative to pre-evaluated savings reported by TPA.

Planned or Proposed Changes to the Offering

Efficiency Clipboard, the software used for data collection in each assessment, added a new component that will track deferments. Efficiency Clipboard is designed to track reasons for deferment for non-recommended trade ally measures. This will help the program team identify issues preventing the completion of energy efficiency upgrades. An example of a deferment reason would be the presence of mold. If mold is present in the home, it would need to be addressed before a recommended measure such as air sealing could be completed so the problem is not compounded. Deferment reasons will also be added to the Efficiency Navigator, the software used by trade allies for project submission, so when the recommended measures cannot be completed, the team will have a database for the justification of the incomplete measures. This helps the program team identify root causes and adjust to produce a higher conversion rate of complete recommended measures.

Retail Lighting & Appliances

Offering Description

The objective of the Retail Lighting and Appliance offering is to increase awareness and sales of efficient lighting and appliances to ENO's residential population. The offering will provide customers the opportunity to purchase a variety of discounted products that are ENERGY STAR qualified or better. The Energy Smart Online Marketplace features energy efficiency products with discounted prices. This allows Entergy New Orleans customers to purchase energy efficiency products online and have them shipped directly to their homes.

Offering Highlights

In Program Year 13, the Retail Lighting and Appliances offering achieved 6,926,676 in verified kWh savings, reaching 87% of the goal. Despite only being offered for six months, point-of-sale lighting rebates were the main driver of savings at participating retailers, accounting for 85% of overall program savings. Additional savings came from the Online Marketplace and mail-in appliance rebates for ENERGY STAR certified refrigerators, window air-conditioning units, pool pumps, dehumidifiers, smart thermostats and heat-pump water heaters. Big-box stores, including The Home Depot, Costco, Lowe's and Walmart, participated in the point-of-sale offering, with sales at Costco and The Home Depot providing the most savings. The program team also continued its partnership with more local stores, including The Green Project, Eddie's Ace Hardware, and the Habitat for Humanity ReStore. Partnerships with local stores are vital to providing access to quality energy-efficient products for customers who shop locally and to support local businesses.

Submissions of mail-in appliance-rebate applications increased in PY13 compared to PY12, primarily due to the addition of rebates for ENERGY STAR certified air purifiers and dehumidifiers. The mail-in appliance-rebate offering has been vital to providing customers better access to energy-efficient products in light of the increasing costs of goods.

The Online Marketplace continues to play an important role in providing customers access to energy-efficient products. New products and offerings were added to the Online Marketplace, including Medify air purifiers and Honeywell dehumidifiers. Additionally, the capability of enrolling a purchased smart thermostat from the Online Marketplace directly into the EasyCool demand response offering was added to all eligible smart thermostats. This cross promotion helped lead to increased demand response capabilities and supported increased participation.

Manufacturer promotions occurred throughout the year on the Online Marketplace, resulting in the sale of 1,759 smart thermostats. The Online Marketplace combined the program's incentives for smart thermostats with manufacturer and retailer discounts during the promotional periods, which allowed customers to purchase deeply discounted Emerson, Nest and Ecobee smart thermostats. Additional promotions on 2- and 4-pack LEDs helped push sales on lighting before incentives were sunset in the second half of the year. The Online Marketplace sold 8,140 LED bulbs, 158 advanced power strips and 261 water-saving products largely as add-on purchases by customers purchasing smart thermostats.

Table 5.1

PARTICIPATION TYPE	
In-Store	**Count**
Lighting	43,572
Online Marketplace	
Advanced Power Strips	158
Smart Thermostats	1,759
Smart Thermostat Accessories	76
Insulation	155
Lighting	8,140
Water Savers	261
Mail-In Rebates	
Pool Pump	7
Heat Pump Water Heater	9
Refrigerator	127
Window Ac	79
Water Cooler	0
Smart thermostat	156
Freezer	3
Portable dehumidifier	19

Table 5.2 Participating Retailer

RETAIL COMPANY	SUPPORTED RETAIL PROGRAMS		ADDRESS
	Lighting	Appliances	
Barto Appliance		X	1400 Airline Dr
Costco Wholesale		X	3900 Dublin St
Home Depot (Bullard)	X	X	12300 I-10 Service Rd
Home Depot (Central)	X	X	1100 S Claiborne Ave
Lowes (Central)	X	X	2501 Elysian Fields Ave
Lowes (Read)		X	5770 Read Blvd
Walmart (Tchoupitoulas)	X	X	1901 Tchoupitoulas St
Walmart (Chef Menteur)	X	X	4301 Chef Menteur Hwy
Walmart (Behrman)	X	X	4001 Behrman Pl
Walmart Bullard	X	X	6000 Bullard Ave
The Green Project	X		2831 Marais St
Eddie's Ace Hardware	X		4401 Downman Rd
Habitat for Humanity ReStore	X		2900 Elysian Fields Ave

Offering Budget and Savings

Table 5.3

COST			ENERGY SAVINGS (kWh)			DEMAND REDUCTION (kW)		
Spend	Budget	%	Pre-Evaluated	Evaluated	%	Pre-Evaluated	Evaluated	%
$634,564	$1,143,327	56%	7,213,086	6,926,676	96%	1,087.39	1,057.33	97%

Table reflects verified gross energy savings achievement from TPE's PY 13 Evaluation, Measurement and Verification (EM&V) findings relative to pre-evaluated savings reported by TPA.

Planned or Proposed Changes to the Offering

With the full enforcement of EISA legislation, the program will focus more on increasing submissions of mail-in rebates and sales on the Online Marketplace in PY14. Retail stores will be increasing the point of purchase rebates for select ENERGY STAR appliances. The online marketplace will add new brands of products. The program will continue to leverage higher incentives with the addition of the pre-enrollment EasyCool incentive on eligible smart thermostats.

Multifamily Solutions

Offering Description

This offering targets multifamily property owners (landlords) and managers, as well as apartment and condo renters. The offerings will address their unique needs through a combination of incentives for both direct install and prescriptive measures, and through property owner and tenant education. A property must have a minimum of five units to qualify for Multifamily Solutions. This allows for the Multifamily Solutions offering to be more focused on the unique needs of owners, managers and renters of larger buildings.

Offering Highlights

The Multifamily Solutions offering achieved 2,971,658 in verified kWh savings, reaching 111% of the goal. The team worked with 12 properties totaling 1,726 units in PY13. This offering continued to build pipeline of interested multifamily complexes for future program years. The offering generated 30% of the savings from direct-install measures at the time of the assessment. Deeper savings measures by the trade allies, which include attic insulation, air sealing and duct sealing, generated the remaining 70% of the savings.

- The offering reached 111% of the kWh goal, achieving 2,971,658 kWh.
- The offering reached 542% of the kW target, achieving 769.32 kW.

Table 6.1

MEASURE	COUNT OF MEASURES	GROSS kWh SAVINGS	% OF kWh CONTRIBUTION
Smart Thermostat	27	7,659	0.3%
Pipe Wrap	941	71,346	2.4%
Low-Flow Showerhead	1,987	380,995	12.8%
LED Lamp 9w (A Type)	4,584	96,281	3.2%
LED Lamp 8w (Flood)	168	5,914	0.2%
LED Lamp 6w (Globe)	2,754	57,829	1.9%
LED Lamp 5w (Candelabra)	1,841	39,794	1.3%
LED Lamp 15w (Outdoor/Par38)	29	5,358	0.2%
LED Lamp 15w (A Type)	3	106	0.0%
LED Lamp 11w (A Type)	2	52	0.0%
Kitchen Aerator	1,595	37,451	1.3%
Duct Sealing	818	1,352,552	45.5%
Bathroom Aerator	2,294	89,773	3.0%
Attic Insulation	31	43,295	1.5%
Air Infiltration	825	683,190	23.0%
Advanced Power Strip (Tier 2)	494	100,062	3.4%
TOTAL	**18,393**	**2,971,658**	**100%**

Offering Budget and Savings

Table 6.2

COST			ENERGY SAVINGS (kWh)			DEMAND REDUCTION (kW)		
Spend	Budget	%	Pre-Evaluated	Evaluated	%	Pre-Evaluated	Evaluated	%
$717,113	$677,241	106%	3,389,330	2,971,658	88%	874.54	769.32	88%

Table reflects verified gross energy savings achievement from TPE's Evaluation, Measurement and Verification (EM&V) findings relative to pre-evaluated savings reported by TPA.

Planned or Proposed Changes to the Offering

The Energy Smart team will collect information for participating Multifamily communities to identify low-income housing and highlight those opportunities in reporting. This will allow the team to demonstrate how this offering impacts both low income and market rate customers.

Income-Qualified Weatherization

Offering Description

The Income-Qualified Weatherization offering is designed to offer qualifying customers free energy efficiency projects ranging from direct install measures, such as LED bulbs and water savings measures, to demand response enabled smart thermostats and comprehensive envelope measures. Comprehensive measures offered by Energy Smart trade allies include air sealing, duct sealing, ceiling insulation and A/C tune ups.

Offering Highlights

The Income-Qualified Weatherization offering achieved 4,355,709 in verified kWh savings, reaching 114% of the goal. In addition, the offering achieved 1,839% of the kW reduction target. During PY13, the Energy Smart team completed 1,226 energy assessments. The Income-Qualified Weatherization offering generated 19% of kWh savings from direct-install measures at the time of the home-energy assessment. Trade allies performed the follow-up measures recommended in the home-energy assessment report, which include attic insulation, air sealing and duct sealing. Follow-up measures generated the remaining 81% of the kWh savings achieved. This measure mix allowed the offering to produce an average reduction of 3,560 kWh per customer.

The Energy Smart team partnered with The Estates, a complex of homes with the Housing Authority of New Orleans and supported 386 customers in the Income-Qualified Weatherization offering. Residents of The Estates experienced high energy burden, with large square footage units to heat and cool. The Energy Smart direct installation equipment and weatherization measures totaled over 1.3 million kWh in energy savings, providing an average savings of 3,452 kWh per customer and an estimated annual bill savings of almost $350.

- A total of 16,242 measures were installed during the program year.
- The offering reached 114% of the kWh goal, achieving 4,355,709 kWh.
- The offering reached 1,806% of the kW target, achieving 1,986.43 kW.

Table 7.1

MEASURE	COUNT OF MEASURES	GROSS kWh SAVINGS	PERCENT OF kWh CONTRIBUTION
Smart Thermostat	181	61,796	1.4%
Pipe Wrap	440	43,604	1.0%
Low-Flow Showerhead	555	110,713	2.5%
LED Lamp 9w (A Type)	5,193	122,414	2.8%
LED Lamp 8w (Flood)	82	3,747	0.1%
LED Lamp 6w (Globe)	295	7,215	0.2%
LED Lamp 5w (Candelabra)	2,629	64,667	1.5%
LED Lamp 15w (Outdoor/Par38)	402	75,456	1.7%
LED Lamp 15w (Outdoor/A Type)	4	778	0.0%
LED Lamp 11w (Flood)	653	26,068	0.6%
LED Lamp 11w (A Type)	323	10,577	0.2%
Kitchen Aerator	485	12,683	0.3%

Duct Sealing	916	2,255,204	51.8%
Bathroom Aerator	850	37,266	0.9%
Attic Insulation	216	352,075	8.1%
Assessment	1,226	0	0.0%
Air Infiltration	956	936,179	21.5%
Advanced Power Strip (Tier 2)	836	235,268	5.4%
TOTAL	**16,242**	**4,355,709**	**100%**

Offering Budget and Savings

Table 7.1

COST			ENERGY SAVINGS (kWh)			DEMAND REDUCTION (kW)		
Spend	**Budget**	**%**	**Pre-Evaluated**	**Evaluated**	**%**	**Pre-Evaluated**	**Evaluated**	**%**
$1,971,880	$1,850,412	107%	4,363,127	4,355,709	100%	2,019.07	1,986.43	98%

Table reflects verified gross energy savings achievement from TPE's Evaluation, Measurement and Verification (EM&V) findings relative to pre-evaluated savings reported by TPA.

Planned or Proposed Changes to the Offering

Efficiency Clipboard, the software used for data collection in each assessment, added a new component that will track deferments. Efficiency Clipboard is designed to track reasons for deferment for non-recommended trade ally measures. This will help the program team identify issues preventing the completion of energy efficiency upgrades. An example of a deferment reason would be the presence of mold. If mold is present in the home, it would need to be addressed before a recommended measure such as air sealing could be completed so the problem is not compounded. Deferment reasons will also be added to the Efficiency Navigator, the software used by trade allies for project submission, so when the recommended measures cannot be completed, the team will have a database for the justification of the incomplete measures. This helps the program team identify root causes and adjust to produce a higher conversion rate of complete recommended measures.

A/C Solutions

Offering Description

The A/C Solutions offering provides residential customers with a more comprehensive set of options to help lower the energy consumption associated with keeping their homes cool and comfortable in the summer. Customers with functioning air conditioning can improve the efficiency of their units with the help of a comprehensive air conditioning tune-up or replacement. The offering also includes the installation of new Demand Response (DR)-enabled smart thermostats. The program works to enhance the ability within the territory's HVAC contractor network to provide value-added services to customers.

Offering Highlights

The A/C Solutions offering achieved 3,538,524 in verified savings, reaching 124% of the goal. The offering served 1,407 customers. Air conditioner tune-ups provided 57% of the kWh savings, and duct sealing generated the additional 43% of the kWh savings.

- A total of 3,145 measures were installed during the program year.
- The offering reached 124% of the kWh goal, achieving 3,538,524 kWh.
- The offering reached 121% of the kW target, achieving 1,498.68 kW.

Table 8.1

MEASURE	COUNT OF MEASURES	GROSS kWh SAVINGS	% OF SAVINGS CONTRIBUTION
Central A/C Replacement	1	195	0.0%
Central A/C Tune-Up	2,521	2,005,324	56.7%
Duct Sealing	613	1,528,273	43.2%
Ductless Heat Pump	2	2,015	0.1%
Smart Thermostat	8	2,718	0.1%
TOTAL	**3,145**	**3,538,524**	**100%**

Offering Budget and Savings

Table 8.2

COST			ENERGY SAVINGS (kWh)			DEMAND REDUCTION (kW)		
Spend	Budget	%	Pre-Evaluated	Evaluated	%	Pre-Evaluated	Evaluated	%
$568,439	$999,341	57%	3,373,191	3,538,524	105%	1,441.94	1,498.68	104%

Table reflects verified gross energy savings achievement from TPE's Evaluation, Measurement and Verification (EM&V) findings relative to pre-evaluated savings reported by TPA.

Planned or Proposed Changes to the Offering

The Energy Smart team will conduct further outreach to recruit new local contractors as trade allies. In the A/C replacement portion of the offering the program will implement a midstream approach working with A/C vendors to offer rebates at the point of purchase for efficient HVAC equipment.

Appliance Recycling & Replacement Pilot

Offering Description

The Appliance Recycling and Replacement Pilot offering encourages early recycling of qualifying low efficiency appliances, such as refrigerators and freezers, for residential customers. The Pilot also offers a refrigerator replacement option for income-qualified residential customers. This offering goes beyond federal recycling requirements using environmentally friendly best practices for recycling all components of each appliance.

Offering Highlights

The Appliance Recycling and Replacement Pilot achieved 113,457 verified kWh savings in PY13. The offering served 100 income-qualified customers with the refrigerator replacement measure, installing a new ENERGY STAR refrigerator which will reduce appliance electricity consumption. The Income-Qualified Weatherization offering added refrigerator replacement criteria to the home assessment to identify qualified customers for this measure. The offering recycled an additional 94 inefficient freezers and refrigerators to remove them from the electric grid permanently.

Offering Budget and Savings

Table 9.2

COST			ENERGY SAVINGS (kWh)			DEMAND REDUCTION (kW)		
Spend	Budget	%	Pre-Evaluated	Evaluated	%	Pre-Evaluated	Evaluated	%
$85,100	$221,737	38%	123,544	113,457	92%	13.97	14.10	101%

Table reflects verified gross energy savings achievement from TPE's Evaluation, Measurement and Verification (EM&V) findings relative to pre-evaluated savings reported by TPA.

Planned or Proposed Changes to the Offering

Changes will be implemented for this program as a key offering partner, ARCA Recycling, closed in 2023. The Energy Smart team will consolidate customer requests via phone or online directly to the Legacy Professional Services team, rather than ARCA recycling. The team will also recycle the units locally in Orleans Parish rather than shipping them to ARCA's facility in Atlanta, GA.

School Kits & Education

Offering Description and Summary

The NOLA Wise School Kits and Outreach Program successfully completed its 13th program year (PY13). This report offers a comprehensive evaluation of the program's energy-related initiatives, accomplishments, and impacts during the year, emphasizing NTC Corporate's dedication to promote energy efficiency and environmental awareness within the local community, on behalf of Entergy New Orleans.

In PY13, the NOLA Wise School Kits and Outreach Program made substantial progress in its mission to empower schools and communities in New Orleans, fostering energy-consciousness and environmental responsibility.

The NOLA Wise School Kit program achieved its goals, resulting in:

- 712,976 verified kWh savings
- Distribution of 4,102 energy-saving kits to 30 schools
- 28 elementary schools and 2 middle schools
- In-school educational shows were viewed by 5,108 students, enabling students to implement energy-saving practices at home.

Educational Outreach

With the Energy Academy program, ENO and NTC collaborated to create a comprehensive energy efficiency curriculum for schools in conjunction with the NOLA Wise School Kits initiative, achieving an annual kWh savings of 712,976.

The program consisted of:

- Live in-school educational performances
- E-learning digital package with bilingual materials
- Teacher training webinars
- Energy savings kit distribution

Offering Budget and Savings

Table 10.1

COST			ENERGY SAVINGS (kWh)			DEMAND REDUCTION (kW)		
Spend	Budget	%	Pre-Evaluated	Evaluated	%	Pre-Evaluated	Evaluated	%
$94,000	$98,600	95%	663,786	712,976	107%	82.04	89.86	110%

Table reflects verified gross energy savings achievement from TPE's Evaluation, Measurement and Verification (EM&V) findings relative to pre-evaluated savings reported by TPA.

Planned or Proposed Changes to the Offering

The National Theatre for Children (NTC), in coordination with Entergy New Orleans, will continue to recruit, enroll, and deliver energy efficiency curriculum. NTC will hire local New Orleans actors to perform assembly presentation skits.

Behavioral Energy Efficiency

Offering Description

The Behavioral offering provides customers a Home Energy Reports (HERs) that are complemented by the Entergy Customer Engagement Portal (CEP). Residential customers will receive a HER which compares them to similar and efficient households, shows their usage over time, provides tips for saving energy, and directs them to other program messaging and offerings.

Offering Highlights

Home Energy Reports (HERs) were produced monthly, with the first reports of the year being sent to customers in May and continued each consecutive month throughout 2023. HERs were emailed monthly to those under that treatment regime, and quarterly to those with print/physical mailings treatment. A total of 488,246 HERs were delivered to more than 127,000 residential customers in PY13. Home Energy Reports included a dynamic set of comparisons to similar and efficient profiles to spur behavioral engagement and usage reduction, promoted Energy Smart offerings to further incentivize energy-saving actions and customer referral to the CEP (offered through Entergy Corporate).

The Program Team continued to promote the core Energy Smart offerings through a Program-awareness Widget in the CEP including ENERGY STAR appliance rebates, A/C Solutions offering and central-air-conditioner rebates, Home Performance with ENERGY STAR assessments, and the Energy Smart Online Marketplace.

The program team transitioned HERs to be generated with AMI meter data rather than monthly billing data in PY13. Also, previous fragmented cohort structures were sunset and customers rolled into a new single cohort in December 2023, which roughly doubled the effective treatment population and will lead to enhanced ability to claim savings in PY14 by virtue of rebalanced statistical power with regard to treatment and control groups.

Offering Participation

Table 11.1

Month of Data	March		April		May	
Send date | Send count	Send Date	Send Count	Send Date	Send Count	Send Date	Send Count
Email - NC (Orig)	5/4/23	11,365	5/24/23	21,402	6/29/23	22,082
Email - NC (New)	5/4/23	1,588	5/24/23	2,986	6/29/23	3,238
Email - SC (Orig)	5/4/23	4,674	5/24/23	8,169	6/29/23	9,839
Email - SC (New)	5/4/23	1,114	5/24/23	2,016	6/29/23	2,643
Print - NC (Old)	5/4/23	5,268	-	-	-	-
Print - ADM NC (New)	5/4/23	21,280	-	-	-	-
Print - NC (New 2023)						
Email - NC (New 2023)						
Total HERs		45,289		34,573		37,802

June		July		August		September	
Send Date	Send Count	Send Date	Send Count	Send Date	Send Count	Send Date	Send Count
7/20/2023	23,669	8/16/2023	23,514	9/25/2023	23,392	10/31/2023	23,136
7/20/2023	3,394	8/16/2023	3,372	9/25/2023	3,331	10/31/2023	3,291
7/20/2023	9,980	8/16/2023	9,854	9/25/2023	9,702	10/31/2023	9,534
7/20/2023	2,659	8/16/2023	2,615	9/25/2023	2,560	10/31/2023	2,513
7/17/2023	5,440	-	-	-	-	10/31/2023	5,352
7/17/2023	21,956	-	-	-	-	10/31/2023	21,154
	67,098		39,355		38,985		64,980

October		November		2023 SUM
Send Date	Send Count	Send Date	Send Count	2023 HERs / Cohort
11/27/2023	23,924			172,484
11/27/2023	3,415			24,615
11/27/2023	10,141			71,893
11/27/2023	2,670			18,790
-	-			16,060
-	-			64,390
		12/29/23	38,348	38,348
		12/29/23	81,666	81,666
	40,150		120,014	488,246

Offering Budget and Savings

Table 11.2

COST			ENERGY SAVINGS (kWh)			DEMAND REDUCTION (kW)		
Spend	**Budget**	**%**	**Pre-Evaluated**	**Evaluated**	**%**	**Pre-Evaluated**	**Evaluated**	**%**
$0	$0	N/A	14,067,914	6,466,294	46%	0	1,091.12	N/A

Table reflects verified gross energy savings achievement from TPE's Evaluation, Measurement and Verification (EM&V) findings relative to pre-evaluated savings reported by TPA.

Planned or Proposed Changes to the Offering

PY14 will utilize a single restructured email and print cohort to double treatment customers.

EasyCool for Residents

Offering Description

The residential Bring Your Own Thermostat (BYOT) DR offering, EasyCool, taps into the existing installed base of connected thermostats in the ENO territory. Through technical integrations with the leading thermostat manufacturers in the industry, ENO will have the ability to enroll, monitor, and control connected thermostats and leverage the enrolled aggregation as a capacity resource for peak demand reduction. When a DR event is dispatched, targeted devices will experience a temperature adjustment (an "offset" or "setback") that will in turn curtail HVAC usage during the peak period.

Offering Highlights

The EasyCool BYOT offering enrolled 2,462 new smart thermostats in PY13. New Orleans experienced record-breaking heat during the summer demand response season. The Program Team dispatched 12 events detailed in table 12.1. Most events included 30 minutes of pre-cooling by two degrees, followed by increase in set temperature by three degrees. Customers could "opt-out" of the event at any time by changing the temperature setting on their thermostat.

- A total of 2,462 new devices were enrolled during the program year.
- A total of 6,565 devices participated during the program year.

Table 12.1: EasyCool BYOT Events

SMART THERMOSTAT EVENTS						
Date	6/13/2023	6/15/2023	6/29/2023	7/18/2023	7/21/2023	8/1/2023
Start Time	4:00	4:00	3:00	4:00	4:00	3:00
End Time	7:00	7:00	6:30	7:00	6:00	6:00
# Devices Targeted	6,496	6,521	6,210	6,296	6,388	6,441
Cooling Offset	3°	3°	3°	3°	3°	3°
Setpoint Ceiling	85°	85°	85°	85°	85°	85°
Pre-cooling	2° 30 min	2° 30 min	2° 30 min	2° 30 min	2° 30 min	2° 30 min

SMART THERMOSTAT EVENTS						
Date	8/4/2023	8/8/2023	8/10/2023	8/11/2023	8/15/2023	8/23/2023
Start Time	3:00	4:00	3:00	4:00	4:00	3:30
End Time	6:00	7:00	6:00	7:00	6:00	6:00
# Devices Targeted	6,462	6,445	6,516	6,500	6,488	6,565
Cooling Offset	3°	3°	3°	3°	3°	3°
Setpoint Ceiling	85°	85°	85°	85°	85°	85°
Pre-cooling	2° 30 min	2° 30 min	2° 30 min	2° 30 min	none	2° 30 min

Offering Budget and Savings

Table 12.2

DEMAND REDUCTION (kW)			ENROLLMENT BUDGET			PARTICIPATION BUDGET		
kW Savings	kW Target	% to Target	Incentives Spent	Incentive Budget	% to Budget	Incentives Spent	Incentive Budget	% to Budget
3,984.08	9,600	42%	$116,825	$230,000	51%	$113,900	$125,000	91%

Planned or Proposed Changes

The Energy Smart and EnergyHub teams have proposed an enrollment bonus twice per year when smart thermostat sales are typically higher – April for Earth Day and November for Black Friday. The team will increase enrollment incentive from $50 to $70 for April and November.

Peak Time Rebate Pilot

Offering Description

The Peak Time Rebate Pilot offering engages residential customers in behavioral demand response. The opt-in pilot recruits customers to enroll to receive notifications for peak demand events and offer recommendations on how they can reduce their energy load during event hours. The program calculates load shed for each participant individually using AMI data and setting a baseline using the 10 weekdays prior to event day. The pilot uses three incentive increments to test motivation for behavior changes during event hours - $10 for low savers, $20 for medium savers and $50 for high savers. The PTR Pilot allows a demand response option for residential customers that is not dependent on a given technology (WiFi, smart thermostat, electric vehicle) rather provides an incentive to change behaviors for a short period of time to reduce electric use. Participants earn an incentive by simply delaying normal electric use such as clothes washing, dish washing, vacuuming, and bathing or by decreasing load by increasing temperature setting on central air conditioning and turning off lights.

Offering Highlights

The Peak Time Rebate Pilot recruitment campaign received a positive response from customers, so the team allowed enrollment up to the year two pilot participant goal of 2,700 customers before closing the pilot enrollment form. Peak event notification emails were sent 24-hours in advance of the event start time. Almost 30% of Pilot program enrollees showed energy savings averaged across all six events, for a total of 793 customers receiving participation incentives. In comparison opt-out programs typically see a participation rate around 4%. Over 82% of enrolled customers saved in at least one of the events. The first season concluded with 529 low savers, 187 medium savers and 77 high savers.

- A total of 2,700 customers enrolled in the Peak Time Rebate Pilot.
- A total of 793 customers showed savings averaged across all six events.

Table 13.1: Peak Time Rebate Pilot Events

PEAK TIME REBATE PILOT EVENTS						
Date	8/1/2024	8/4/2024	8/8/2024	8/9/2024	8/10/2024	8/23/2024
Start Time	4:00	4:00	4:00	4:00	4:00	3:30
End Time	7:00	7:00	7:00	7:00	7:00	6:00
Total kWh reduction	1,700	1,635	1,787	1,476	1,301	979

Offering Budget and Savings

Table 13.2

DEMAND REDUCTION (kW)			BUDGET		
kW Savings	**kW Target**	**% to Target**	**Incentives Spent**	**Incentive Budget**	**% to Budget**
200.5	714	28%	$12,880	$48,275	27%

Planned or Proposed Changes

The Peak Time Rebate pilot will include additional customer education regarding ways they can reduce electricity demand in their home during peak demand events. The team will also add text messaging in addition to the existing emails to notify customers about peak demand events.

Residential Battery Energy Storage Pilot

Offering Description

The Residential Battery Pilot commenced on April 1, 2023 and ran through the summer season ending September 30, 2023. There was a limit of eight total events per customer over the season. The program's objective was to secure 135kW in peak demand reduction through the participation of 30 residential battery customers. The target audience was residential customers who have already purchased, or plan to purchase, a residential battery storage solution as part of their home solar photovoltaic (PV) system. The incentives were designed to encourage participation in the battery storage demand response program. They were not designed to influence battery storage adoption or convert a PV system customer into a PV + battery storage customer.

There were two main objectives of the pilot. The first was to understand how much demand reduction could be realized during peak periods. The second was to determine acceptance of the program's utilization of customers' battery for a demand response program.

Offering Highlights

The Pilot program enrolled 17 residential customers and concluded after the final event on September 29, 2023. There were several unforeseen challenges with the pilot program specifically as it relates to post-installation issues and incomplete projects due to several of the local contractors going out of business. As a result of these circumstances, Honeywell worked with the contractor community to refer customers to an alternate contractor to allow for participation in the program.

Honeywell marketed the program to residents, manufacturers, and installers. Prior to the season, an email was sent, and a physical postcard was mailed to all qualifying battery customers. This was followed up six weeks later by another letter mailed to any remaining qualified households. Those customers with an Enphase battery also received direct Enphase branded email marketing in early September. A referral incentive was also available for customers and trade allies but was not utilized. Direct physical mail proved to be the most beneficial.

Entergy called ten battery demand response events during the Summer 2023 pilot season.

Table 14.1

DEMAND REDUCTION (kW)			BUDGET		
kW Savings	kW Target	% to Target	Incentives Spent	Incentive Budget	% to Budget
80.27	135	59%	$9,350	$18,500	51%

Bring Your Own Charger (BYOC)

Offering Description

The BYOC program incentivizes Electric Vehicle (EV) owners to charge their vehicles during preset off-peak hours, with no special hardware or separate meter required. Participants program their vehicles to charge during off-peak hours, and software developed by the program administrator, Sagewell, confirms off-peak charging is taking place using AMI data. The program has a 2023 enrollment goal of 350 vehicles. Enrolled customers receive a credit of $7 per month, paid quarterly.

The residential Bring Your Own Charger (BYOC) electric vehicle (EV) load shifting program leverages the residential Automated Metering Infrastructure (AMI) “smart” meters in ENO territory. EV drivers in Orleans Parish can enroll in the program regardless of which type of EV or home level 2 charger they use. The program has a cap of 350 new vehicles per calendar year. To enroll, drivers schedule their EV(s) to charge between 9 p.m. and 6 a.m. during the week, and any time of weekends and holidays. Program implementer Sagewell, Inc. verifies applications, monitors EV charging behavior via AMI data and proprietary data processing algorithms, and issues incentives for eligible drivers. BYOC is an “every day” load shifting program, and the program does not call events during peak windows. By scheduling their EV at enrollment, more than 90% of all EV charging occurs off-peak in BYOC programs across the country.

Offering Highlights

The BYOC offering opened for enrollment on July 18 2023, and by December 31, 2023, 94 customers had enrolled101 vehicles. Due to technical delays receiving the AMI data, program marketing targeting likely EV drivers was delayed until early 2024. Because the AMI data was not available in time to calculate customer incentives for Q3, ENO staff decided to pay all participating customers the full Q3 incentive amount. The Q4 AMI data became available in January 2024 and was used to evaluate the driver performance in Q4. In Q4 2024, 89% of all EV charging hours successfully occurred during off-peak periods even without compliance reminders. Starting in Q1 2024, EV drivers who charged on peak multiple times began to receive alerts for non-compliant charging.

Approximately one third of enrolled drivers in Q4 did not meet the required minimum number of charging sessions to earn incentives. However, given that drivers were not able to receive feedback on their charging before the end of Q4, it was decided that those drivers would receive the full incentive, and a notification about changes to charging behavior required to earn future incentives.

Offering Budget and Savings

Table 15.1

DEMAND REDUCTION (kW)			BUDGET		
kW Savings	kW Target	% to Target	Incentives Spent	Incentive Budget	% to Budget
49.4	525	9%	$3,458	$29,400	12%

Planned or Proposed Changes

In PY14, the BYOC program began active marketing efforts, including email and mailer campaigns. These efforts will increase enrollment closer to program targets. To better align with customer charging behavior, program incentive requirements have changed from at least 3 off-peak charging sessions per month to either A) at least 3 off-peak charging sessions or B) at least 6 total hours of off-peak charging. This will accommodate those drivers that charge at home only a few times per month, but each session is relatively long.

In the future ENO anticipates more timely transfer of AMI data, which will allow for more prompt customer follow-up when on-peak charging is identified. These efforts will ensure over 90% of EV charging occurs during off-peak hours.

COMMERCIAL & INDUSTRIAL OFFERINGS

Table 16.1

OFFERING	kWh SAVINGS	kWh GOAL*	% TO GOAL	kW SAVINGS	kW TARGET *	% TO GOAL	INCENTIVES	BUDGET	% TO BUDGET
Small Commercial & Industrial Solutions	2,400,157	4,925,994	49%	296.19	949	31%	$292,395	$711,293	41%
Large Commercial & Industrial Solutions	20,886,316	35,008,874	60%	3,378.43	6,475	52%	$2,346,572	$4,037,813	58%
Publicly Funded Institutions	2,935,278	10,799,767	27%	335.55	409	82%	$307,720	$1,486,165	21%
Commercial & Industrial Construction Solutions	261,865	3,512,971	7%	57.84	806	7%	$31,856	$132,300	24%
Large C&I Automated Demand Response	72,445	N/A	N/A	3,019.95	6,970	43%	$208,581	$418,200	50%
TOTAL	**26,556,060**	**54,247,606**	**49%**	**7,087.95**	**15,609**	**45%**	**$3,187,125**	**$6,785,771**	**47%**

** Goals are reflective of the approved Energy Smart Implementation Plan for PY13-14.*

Small Commercial & Industrial Solutions

Offering Description

The Small Commercial & Industrial Solutions offering provides small businesses (100 kW demand or less) and other qualified non-residential customers the opportunity to achieve electricity savings through strategies designed specifically for this sector. This offering helps small business customers analyze facility energy use and identify energy efficiency improvement projects. Program participants are advised on applicable offerings through the program as well as financial incentives for eligible efficiency measures that are installed in their facilities by trade allies.

Offering Highlights

The Small Commercial & Industrial Solutions offering achieved 2,400,157 kWh in verified gross kWh savings, reaching 49% of goal. In PY13 Energy Smart experienced a significant decline in the number of Small Commercial & Industrial project applications submitted by trade allies. In program surveys trade allies indicated they were doing minimal or no outreach to the small commercial customer base due to challenges with staffing sales representatives. As a result, the focus of the Small Commercial & Industrial Solutions offering in PY13 was to re-engage with Small Commercial trade allies that had previously been more active before COVID-19 as well as recruiting new trade allies to implement projects for small commercial customers. The Energy Smart team also designed the Small Business Energy Assessment offering in order to continue to engage with Small Commercial customers. The initial goal of the Small Business Energy Assessment was to generate Small Commercial savings through the direct installation of select energy conservation measures, however, an additional benefit of the Small Business Energy Assessments was the project leads that were identified during the assessment and assigned to trade allies. Energy Smart began distributing these leads to re-energize existing trade allies and as a recruitment tool for new trade allies.

Beginning in May, the Energy Smart team began offering Small Business Energy Assessments to Small Commercial customers, completing over 130 assessments in PY13. First an Energy Smart representative would provide a free walk-through assessment and identify energy conservation measures that were eligible for incentives. Once an assessment was complete the small business customer was provided a list of equipment that was eligible for no-cost replacement which included linear LEDs, smart thermostats, advanced power strips and water measures if the facility utilized electric water heaters. Once the no-cost measures were installed the Energy Smart representative would review the remaining measures identified during the assessment with the customer. If a customer indicated they were interested in implementing additional projects, Energy Smart would assign that information to trade allies to generate a quote for the customer.

- A total of 491 measures were installed during the program year.
- The offering reached 49% of the goal, achieving 2,400,157 kWh.
- The offering reached 31% of the kW target, achieving 296.19 kW.

Table 17.1

Project Components	Gross kWh Savings	% of Savings Contribution
Lighting	1,249,682	52%
Refrigeration	10,858	0.5%
HVAC	85,290	4%
Controls	781,282	33%
Water Heating	4,159	0.2%
Kit	28,156	1%
Insulation	26,742	1%
Compressed Air	186,361	8%
Total	**2,400,157**	

Table 17.2

Project Type	Total Incentives	Total Project Costs	% Covered
Custom Lighting	$58,539	$141,360	41%
Custom Non-Lighting	$92,045	$228,731	40%
Prescriptive	$141,811	$688,344	21%
Total	**$292,395**	**$1,058,435**	**28%**

Table 17.3

Program Component	Count of Measures	Gross kWh Savings
Prescriptive	413	42%
Custom*	78	58%
Total	**491**	**100%**

*Custom measure count includes bonus measures

Chart 17.1

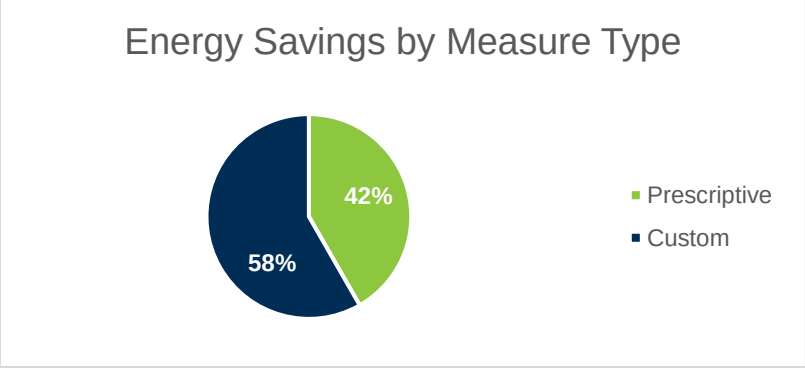
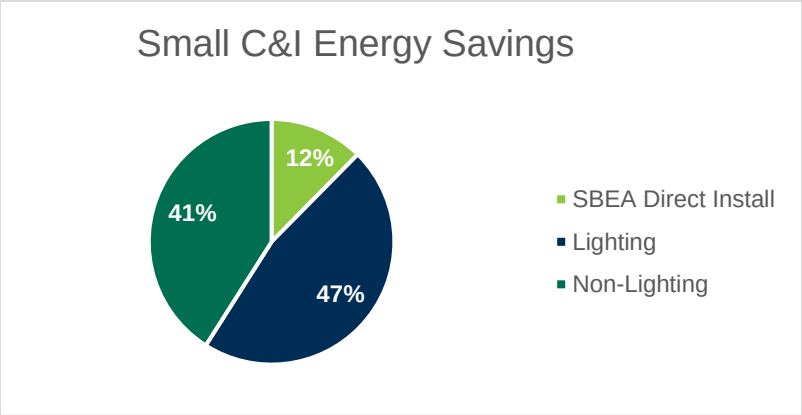


Chart 17.2



Offering Budget and Savings

Table 17.4

COST			ENERGY SAVINGS (kWh)			DEMAND REDUCTION (kW)		
Spend	**Budget**	**%**	**Pre-Evaluated**	**Evaluated**	**%**	**Pre-Evaluated**	**Evaluated**	**%**
$292,395	$711,293	41%	2,486,454	2,400,157	97%	277.21	296.19	107%

Table reflects verified gross energy savings achievement from TPE's Evaluation, Measurement and Verification (EM&V) findings relative to pre-evaluated savings reported by TPA.

Planned or Proposed Changes to the Offering

Energy Smart will re-engage and recruit Small Commercial trade allies in PY14 by increasing prescriptive and custom incentive rates, redesigning the commercial HVAC tune-up offering and tripling the number of Small Business Energy Assessments that were performed in PY13. Increasing Small Commercial & Industrial incentive rates will attract other program trade allies to Entergy New Orleans' territory and the increased rates will shorten the return on investment for proposed projects. Increasing incentives and redesigning the incentive rate structure for HVAC tune-ups will simplify this measure and attract qualified contractors. The energy savings potential associated with HVAC tune-ups in addition to the increased incentive will serve as an attractive entry point for customers participating in the program for the first time.

Large Commercial & Industrial Solutions

Offering Description

The primary objective of the Large Commercial and Industrial Solutions offering is to provide a solution for larger (greater than 100 kW demand) non-residential customers interested in energy efficiency through a prescriptive or custom approach. The Large Commercial & Industrial offering is designed to generate significant energy savings, as well as a longer-term market penetration by nurturing delivery channels, such as design professionals, distributors, installation contractors and Energy Service Companies (ESCOs).

Offering Highlights

The Large Commercial & Industrial offering achieved 20,886,316 kWh in verified gross kWh savings in PY13, reaching 60% of the offering goal. Over $2.3 million incentives were paid to 94 Large Commercial projects completed in PY13. Thirty of the Large Commercial & Industrial projects received an incentive equal to the full project cost and the average incentive per project covered 36% of the overall project cost. The Energy Smart team continued to promote non-lighting measures in PY13 to generate deeper savings and a more diverse measure mix for the Large Commercial & Industrial Solutions offering. Non-lighting measures continue to account for a larger portion of the Large Commercial & Industrial measure mix making up 51% of the overall Large Commercial & Industrial savings.

- A total of 314 measures were installed during the program year.
- The offering reached 60% of the kWh goal, achieving 20,886,316 kWh.
- The offering reached 52% of the kW target, achieving 3,378.4 kW.

Table 18.1

Project Components	Gross kWh Savings	% Of Savings Contribution
Lighting	**10,168,670**	**49%**
Refrigeration	16,827	0%
HVAC	5,486,052	26%
Controls	4,911,780	24%
Air Compressor	302,986	1%
Total	20,886,316	100%

Table 18.2

Project Type	Total Incentives	Total Project Costs	% Covered
Custom Lighting	$361,715	$1,010,120	36%
Custom Non-Lighting	$1,122,705	$2,437,815	46%
Prescriptive	$862,152	$2,996,758	29%
Total	**$2,346,572**	**$6,444,693**	**36%**

Chart 18.3

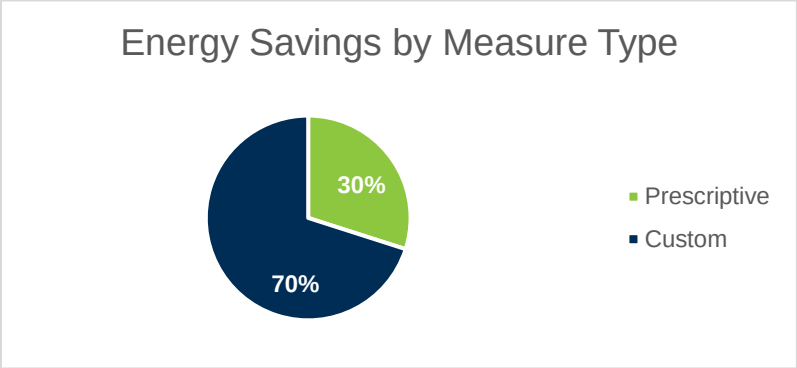
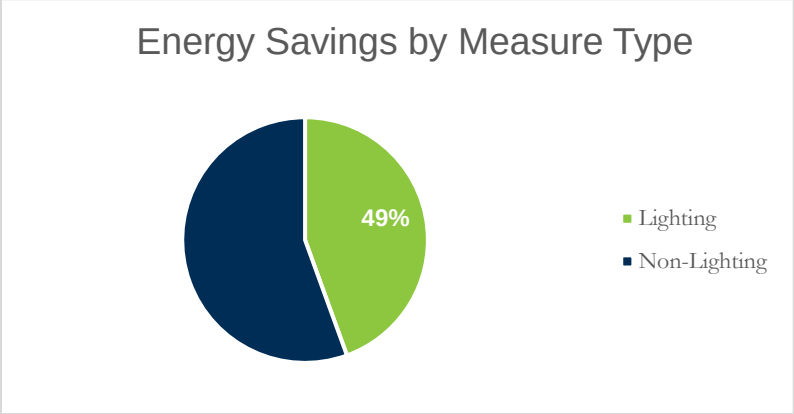


Chart 18.4



Offering Budget and Savings

Table 18.5

COST			ENERGY SAVINGS (kWh)			DEMAND REDUCTION (kW)		
Spend	Budget	%	Pre-Evaluated	Evaluated	%	Pre-Evaluated	Evaluated	%
$2,346,572	$4,037,813	58%	19,036,327	20,886,316	110%	2,083.99	3,378.43	162%

Table reflects verified gross energy savings achievement from TPE's Evaluation, Measurement and Verification (EM&V) findings relative to pre-evaluated savings reported by TPA.

Planned or Proposed Changes to the Offering

The Large Commercial & Industrial offering goal for PY14 is extremely aggressive, more than 10 million kWh higher than the PY13 goal. The program team compared Energy Smart to other regional energy efficiency programs and has designed incentive increases to remain competitive for attracting additional qualified trade ally contractors and shortening payback periods for customers. Trade allies indicated that strict bonus deadlines in previous program years made selling large and often long-term projects more difficult. In response, the Energy Smart team will suspend program bonuses in PY14 and replace with permanent incentive rate increases.

Energy Smart will also prioritize promoting the new chiller tune-up measure to Large Commercial & Industrial customers and trade allies in PY14. Similar to the A/C tune-up measure, the chiller tune-up measure will provide an attractive entry point for Large C&I customers participating in the program for the first time.

Publicly Funded Institutions

Offering Description

The Publicly Funded Institutions (PFI) offering is targeted at local publicly funded institutions. The offering assists end-use customers in overcoming barriers that are specific to publicly funded groups. Through hands-on expertise and consulting, the program benchmarks the institution's energy use and identifies a roadmap to success. Customers are given guidance throughout their engagement with the program.

Offering Highlights

The Publicly Funded Institutions offering achieved 2,935,278 kWh in verified gross kWh savings in PY13, reaching 27% of goal. Nineteen Energy Smart projects were completed for Publicly Funded customers in PY13 including projects at the Sewerage & Water Board, the New Orleans Recreation Department, the General Services Administration and the Orleans Parish School Board. Publicly Funded Institutions received over $300,000 in Energy Smart incentives in PY13. Five projects received an incentive equal to the full project cost and on average Energy Smart incentives covered 50% of project costs.

Energy Smart continued to engage the City of New Orleans (City), the largest commercial building owner in Orleans Parish. The Program planned for 7 million kWh pipeline for PFI projects identified in PY12 that ultimately the City was unable to complete in PY13. The program will continue to support Property Management staff in identifying energy efficiency opportunities and completing program applications.

Table 19.1

Project Components	Gross kWh Savings	% Of Savings Contribution
Lighting	2,062,811	70%
Controls	820,552	28%
HVAC	51,914	2%
Total	**2,935,278**	**100%**

Table 19.2

Project Type	Total Incentives	Total Project Costs	% Covered
Custom Lighting	$1,209	$41,113	3%
Custom Non-Lighting	$101,494	$268,173	38%
Prescriptive	$205,017	$1,587,386	13%
Total	**$307,720**	**$1,896,672**	**16%**

Table 19.3

Program Component	Count of Measures	Gross kWh Savings
Prescriptive	40	58%
Custom	10	42%
Total	**50**	**100%**

Offering Budget and Savings

- A total of 50 measures were installed during the program year.
- The offering reached 27% of the kWh goal, achieving 2,935,278kWh.
- The offering reached 82% of the kW target, achieving 335.55 kW.

Table 19.4

COST			ENERGY SAVINGS (kWh)			DEMAND REDUCTION (kW)		
Spend	**Budget**	**%**	**Pre-Evaluated**	**Evaluated**	**%**	**Pre-Evaluated**	**Evaluated**	**%**
$307,720	$1,486,165	21%	3,233,597	2,935,278	91%	253.52	335.55	132%

Table reflects verified gross energy savings achievement from TPE's Evaluation, Measurement and Verification (EM&V) findings relative to pre-evaluated savings reported by TPA.

Planned or Proposed Changes to the Offering

The Energy Smart team will continue to focus on key customers in this sector including the Sewerage & Water Board, The Regional Transit Authority and NASA as each of these customers have substantial energy savings potential. Energy Smart outreach team will create efficiency plans for each of these customers and coordinate with Entergy New Orleans Customer Service team to schedule and attend regular standing meetings with these customers.

Energy Smart will coordinate with the City's Office of Resilience and Sustainability (ORS) to explore new strategies to contribute to the sustainability goals outlined in the ORS Department's sustainability plan. Energy Smart outreach staff will identify City-owned commercial properties that are eligible for Small Business Energy Assessments, such as New Orleans Fire Stations, the Sherriff's Office, juvenile and adult justice facilities, and more.

Commercial & Industrial Construction Solutions

Offering Description

The new Commercial & Industrial Construction Solutions offering encourages customers to design and construct higher efficiency facilities than building code or planned designs. This offering is available to ground-up construction, additions or expansions, building repurposing and commercial building restorations. The New Construction offering provides incentives for design assistance, prescriptive measures and custom upgrades tailored to the customer's building operations.

Offering Highlights

The Commercial & Industrial Construction Solutions offering achieved 261,865 kWh in verified gross kWh savings in PY13 reaching 7% of the energy savings goal. Approval of PY13 programs so close to the beginning of PY13 hindered the ability to pre-approve PY13 new construction projects in PY12 negatively impacted the C&I Construction Solutions pipeline. C&I Construction Solutions projects typically require a high degree of coordination with the contractor and architectural firm during the design phase and these projects generally take a minimum of a year from design to project implementation. The primary focus of the C&I Construction Solutions offering in PY13 was to continue aggressively pursuing participation from new construction and architectural firms. Five Commercial & Industrial Construction solution projects were completed in Program Year 13, an increase from two completed projects in PY12, and each of these projects were submitted by a contractor that was participating for their first time. PY13 Commercial & Industrial Construction Solutions projects included a mix of measures such as LED lighting, efficient commercial kitchen equipment, vent controls, efficient HVAC equipment, and heat pumps.

- A total of 25 measures were installed during the program year.
- The offering reached 7% of the kWh goal, achieving 261,865 kWh.
- The offering reached 7% of the kW target, achieving 57.84 kW.

Table 20.1

Program Component	Count of Measures	Gross kWh Savings
New Construction Inerior Lighting	4	103,940
New Construction Exterior Lighting	2	36,364
HVAC	82	43,584
Kitchen Exhaust Controls	3	14,699
ENERGY STAR Refrigerator	4	2,394
ENERGY STAR Freezer	1	2,201
ENERGY STAR Dishwasher	3	18,154
Convection Oven	1	1,362
VFD	8	34,097
Insulation	1	5,040
Cool Roof	1	30
Total	**110**	**261,865**

Offering Budget and Savings

Table 20.2

COST			ENERGY SAVINGS (kWh)			DEMAND REDUCTION (kW)		
Spend	Budget	%	Pre-Evaluated	Evaluated	%	Pre-Evaluated	Evaluated	%
$31,856	$132,300	24%	343,381	261,865	76%	57.44	57.84	101%

Table reflects verified gross energy savings achievement from TPE's Evaluation, Measurement and Verification (EM&V) findings relative to pre-evaluated savings reported by TPA.

Planned or Proposed Changes to the Offering

In 2022, the Louisiana Legislature approved adoption of new energy codes advancing statewide code from IECC 2009 to IECC 2021. The IECC 2021 energy codes were effective as of July 2023, and represent a four-step advancement in energy codes, no other State has attempted to advance this many steps in a single update. The Energy Smart team will create an intermediary step to support customers and trade allies in meeting the advanced energy codes in PY14. The C&I Construction Solutions offering will be replaced by New Construction Code Compliance prescriptive and custom incentives for meeting IECC 2021, while using IECC 2015 as the baseline for energy savings calculations. The default baseline will use two code steps as the baseline for calculating savings (IECC 2015) for PY14 and PY15.

Large Commercial & Industrial Demand Response

Offering Description

The Large Commercial & Industrial Demand Response (DR) offering launched with an objective to secure a total of 7.5 megawatts (MW) of commercial demand shed over term of the program cycle (through PY15). Large commercial customers (exceeding 100kW peak demand) are being recruited and enrolled for an automated turn-key DR solution.

An advanced software platform, Concerto®, is utilized for dispatch, control and optimization of all DR resources enrolled in the offering. Concerto is utilized to advance goals of maximizing customer satisfaction for participants in the offering while being adaptable to new and changing technologies that can provide flexibility and reliability, such as batteries, electric vehicles and distributed solar.

Concerto® has been integrated with Entergy electrical meters. The integration allows Concerto® to produce same-day consumption and demand baselines to monitor customer performance in the Large C&I DR offering. Daily monitoring allows the customer, and in turn the Program Team, to maximize energy savings.

Offering Highlights

The Program Team conducted 48 site surveys including hospitals, secondary schools, commercial office space, university, and industrial sites totaling 87.7MW. The offering includes 19 enrolled customers totaling 6.86MW. There are four projects in the installation and testing phase totaling 904kW.

In addition to directly targeting customers, the outreach team is educating controls contractors on program benefits for both the controls company and their customers. Honeywell has joined local industry organizations to further conduct outreach and promote the multiple benefits of program participation in Energy Smart and the Large C&I DR offering.

Entergy called 12 C&I DR events during the Summer 2023 Summer season.

Offering Budget and Savings

Table 21.1

COST			ENERGY SAVINGS (kWh)			DEMAND REDUCTION (kW)		
Spend	Budget	%	Pre-Evaluated	Evaluated	%	Pre-Evaluated	Evaluated	%
$208,581	$418,200	50%	69,834	72,445	104%	3,720.21	3,019.95	81%

Table reflects verified gross energy savings achievement from TPE's Evaluation, Measurement and Verification (EM&V) findings relative to pre-evaluated savings reported by Implementor.

Marketing, Outreach & Engagement

Residential Marketing and Outreach

Highlights

Program Year 13 kicked off in January with customer satisfaction surveys. The team sent survey emails to customers who had recently participated in the following Energy Smart program offerings: Home Performance with ENERGY STAR® (HPwES), Income-Qualified Weatherization (IQW), A/C Tune-Up and the Online Marketplace. Additional sets of customer satisfaction survey emails were sent in May and December. The results of the surveys will be discussed in the Residential Customer Satisfaction section below.

Every month, the Energy Smart team creates an article for the monthly Circuit newsletter and a corresponding social media post to increase awareness and promote overall participation in the variety of offerings available to residential customers.

Table 22.1: Circuit Newsletter Energy Smart topics

MONTH	TOPIC	OFFERINGS
January	Make energy savings a top priority in 2023	Energy Efficiency Kit, Home Performance with ENERGY STAR® and Income-Qualified Weatherization assessments
February	Seize the day and energy savings	Rebates, Home Performance with ENERGY STAR® and Income-Qualified Weatherization assessments
March	Energy savings bloom this Spring	A/C Tune-up, Home Performance with ENERGY STAR® and Income-Qualified Weatherization assessments
April	Energy-Efficient ways to invent in our planet for Earth Day	A/C Tune-up, Home Performance with ENERGY STAR® and Income-Qualified Weatherization assessments
May	Clean Air Month	A/C Solutions and Rebates
June	Great Outdoors Month	A/C Solutions and Rebates (Pool pump, heating and cooling equipment)
	Cash savings opportunities	Peak Time Rebate and EasyCool
July	Ice Cream Month - enjoy sweet savings	Appliance Rebates (Air purifier, Dehumidifier, Water cooler)
	Chill out and cash in	Appliance Recycling
August	Back-to-School List	A/C Tune-up
September	What's the buzz? Cruising into cash incentives	A/C Tune-up, Home Performance with ENERGY STAR® and Income-Qualified Weatherization assessments, Online Marketplace, Rebates EasyCool and Bring Your Own Charger (BYOC)
October	Energy Awareness Month	Home Performance with ENERGY STAR® and Income-Qualified Weatherization assessments, A/C Solutions, Appliance Rebates, Online Marketplace
	Turn old into gold	Appliance Recycling
November	N/A	
December	N/A	

In February, the Energy Smart team produced a Home Performance with ENERGY STAR® bill insert. The two-sided bill insert showcased the benefits of the Home Performance with ENERGY STAR® offering along with all the other offerings available to customers through the Energy Smart program. The bill insert was sent to 110,000 customers between February 2 and March 1, 2023.

The Q1 digital campaign launched on February 8. The campaign targeted customers in the Entergy New Orleans territory. The digital campaign consisted of a Facebook ad, Google Search ad and Google Display ads. The Facebook ad launched on February 8 and the Google Search and Display ads kicked-off a week later February 15. The primary messaging for all three digital ads focused on the Home Performance with ENERGY STAR® offering and Residential Appliances as a secondary message.

Table 22.2: Q1 Digital Campaign Results

CHANNEL	IN-MARKET DATE	IMPRESSIONS/ SENDS	AUDIENCE REACH/ OPENS	OPEN RATE	CLICKS	CLICK-THROUGH RATE
Facebook ad (gif)	February 8–March 31, 2023	25,556	N/A	N/A	353	1.38%
Google Search ad	February 15–March 31, 2023	2,983	N/A	N/A	330	11.06%
Google Display ads	February 15–March 31, 2023	614,772	N/A	N/A	507	0.08%

On February 13, the Q1 campaign launched focusing on the Home Performance with ENERGY STAR® offering and lighting discounts available in-store or on the Online Marketplace. The campaign included a postcard mailing, a lead generation email, a did-not-open email and a did-not-click email. The did-not-open email is a remarketing email to customers that did not open the lead generation email and the did-not-click email is a remarketing email to customers that opened the lead generation email but did not click the call to action in the lead generation email. The campaign targeted residential customers who had not participated in the Home Performance with ENERGY STAR® (HPwES) offering and lived within the Entergy New Orleans territory. The first postcard was sent on February 13 to customers that lived in the ZIP codes 70112, 70118, 70119 and the lead generation email was sent on February 13 to customers that lived in the ZIP codes from 70112-70119. The second postcard drop was sent on February 28 and targeted customers that lived in ZIP codes 70113, 70115, 70116 and 70117 while the second lead generation email was sent on March 2 and targeted customers that lived in ZIP codes 70122-70130, 70114 and 70131.

Table 22.3: Home Performance with ENERGY STAR Campaign Results

CHANNEL	IN-MARKET DATE	IMPRESSIONS/ SENDS	AUDIENCE REACH/ OPENS	OPEN RATE	CLICKS	CLICK-THROUGH RATE
Postcard – Drop 1	February 13, 2023	5,164	N/A	N/A	N/A	N/A
Lead Gen Email – Drop 1	February 13, 2023	49,073	8,848	18.74%	395	0.84%
Did Not Open Email – Drop 1	February 20, 2023	42,389	3,360	8.05%	145	0.35%
Did Not Click Email – Drop 1	February 20, 2023	4,704	2,745	58.35%	51	1.86%
Postcard – Drop 2	February 28, 2023	5,721	N/A	N/A	N/A	N/A
Lead Gen Email – Drop 2	March 2, 2023	52,710	9,391	18.26%	489	0.95%
Did Not Open Email – Drop 2	March 9, 2023	45,877	4,619	10.2%	190	0.42%
Did Not Click Email – Drop 2	March 9, 2023	37,957	6,907	18.33%	188	0.5%

A large focus for the first six months of the year was on lighting. To help achieve the lighting savings goals, the Program Team sent an LED kit to eligible customers who had not had a Home Performance with ENERGY STAR® or Income-Qualified Weatherization assessment, with a focus on customers that were high energy users or in arrears. The LED kit contained five 9-watt standard LEDs, two 15-watt LEDs and one 13-watt standard LED. After the kit was mailed to customers, the team followed-up with a postcard mailing and three emails for those customers that had an email address. The three emails sent were a

lead generation, did-not-open and did-not-click email. The kits and subsequent follow-up campaign was divided into four separate drops. All customers that were targeted did not have a Home Performance with ENERGY STAR® or Income-Qualified assessment or received an LED kit. Customers were then targeted based on the ZIP code for their residence and focused on customers who are high energy users or may need bill assistance. Drops 1 and 2 were sent to customers who lived in 70014 or 70131. Drop 3 was sent to customers who lived in 70112, 70113, 70115, 70116, 70117, 70118, 70119, 70125, 70130. Drop 4 was sent to customers who lived in 70122, 70124, 70126, 70127, 70128, 70129, 70148.

Table 22.4: LED Kit and Follow-Up Campaign Results

CHANNEL	IN-MARKET DATE	IMPRESSIONS/ SENDS	AUDIENCE REACH/ OPENS	OPEN RATE	CLICKS	CLICK-THROUGH RATE
LED Kit – Drop 1	February 21, 2023	4,242	N/A	N/A	N/A	N/A
Postcard – Drop 1	March 7, 2023	4,242	N/A	N/A	N/A	N/A
Lead Gen Email – Drop 1	March 15, 2023	2,916	438	15.18%	26	0.9%
Did Not Open Email – Drop 1	March 21, 2023	2,597	213	8.32%	11	0.43%
Did Not Click Email – Drop 1	March 21, 2023	299	155	51.81%	6	2.01%
LED Kit – Drop 2	March 7, 2023	4,250	N/A	N/A	N/A	N/A
Postcard – Drop 2	March 17, 2023	4,202	N/A	N/A	N/A	N/A
Lead Gen Email – Drop 2	March 24, 2023	2,974	555	19.48%	26	0.91%
Did Not Open Email – Drop 2	March 31, 2023	2,006	123	6.25%	9	0.46%
Did Not Click Email – Drop 2	March 31, 2023	318	148	46.67%	1	0.32%
LED Kit – Drop 3	April 21, 2023	8,122	N/A	N/A	N/A	N/A
Lead Gen Email – Drop 3 & 4	May 9, 2023	6,148	794	13.15%	48	0.8%
Postcard – Drop 3	May 18, 2023	16,115	N/A	N/A	N/A	N/A
Did Not Open Email – Drop 3	May 16, 2023	5,598	368	6.69%	18	0.33%
Did Not Click Email – Drop 3	May 16, 2023	479	204	42.62%	4	0.84%
LED Kit – Drop 4	May 11, 2023	8,122	N/A	N/A	N/A	N/A
Lead Gen Email – Drop 4	May 25, 2023	7,226	981	13.9%	84	1.19%
Did Not Open Email – Drop 4	June 1, 2023	6,417	487	7.61%	52	0.81%
Did Not Click Email – Drop 4	June 1, 2023	634	325	51.23%	28	4.42%

In April, the Department of Energy announced that the Energy Smart program won the 2023 ENERGY STAR® Partner of the Year Award—Sustained Excellence for the fourth consecutive year. The Energy Smart program was recognized for its efforts to advance innovations in residential energy efficiency programs and technologies to improve the affordability of home energy upgrades for diverse households through Home Performance with ENERGY STAR®. The Energy Smart team worked collaboratively with Entergy New Orleans communications team in developing the news release that ran on the Entergy New Orleans website.

On April 1, the Q2 digital campaign launched and targeted customers in the Entergy New Orleans territory. The digital campaign consisted of a Facebook ad, Google Search and Google Display ads. The primary messaging for all three ads focused on the Home Performance with ENERGY STAR® offering and A/C Tune-Up as secondary messaging.

Table 22.5: Q2 Digital Campaign Results

CHANNEL	IN-MARKET DATE	IMPRESSIONS/ SENDS	AUDIENCE REACH/ OPENS	OPEN RATE	CLICKS	CLICK-THROUGH RATE
Facebook ad (gif)	April 1-June 30, 2023	187,876	N/A	N/A	1,299	0.56%
Google Search ad	April 1-June 30, 2023	10,143	N/A	N/A	9.26	9.13%
Google Display ads	April 1-June 30, 2023	1,090,674	N/A	N/A	1,068	0.08%

On April 14, the April campaign launched. The April campaign consisted of a postcard, lead generation email, did-not-open email and did-not-click email. The campaign targeted any customer who lived in the Entergy New Orleans territory, have not had an assessment, and did not receive the LED kit that was sent on April 21. The campaign started with the lead generation email on April 14 sent to 110,611 customers and followed up by the postcard mailed on April 18 to 9,999 customers. The did not open and did not click emails were sent 10 days after the lead generation email on April 24.

Table 22.6: April Campaign Results

CHANNEL	IN-MARKET DATE	IMPRESSIONS/ SENDS	AUDIENCE REACH/ OPENS	OPEN RATE	CLICKS	CLICK-THROUGH RATE
Lead Generation Email	April 14, 2023	110,611	13,856	13.02%	559	0.53%
Postcard	April 18, 2023	9,999	N/A	N/A	N/A	N/A
Did-Not-Open Email	April 24, 2023	98,859	8,241	8.5%	467	0.48%
Did-Not-Click Email	April 24, 2023	8,425	4,815	57.4%	171	2.04%

In May, the Energy Smart team produced an A/C tune-up bill insert. The two-sided bill insert encouraged customers to sign up for an A/C tune-up and highlighted the benefits of a more efficient cooling system, along with the other rebates available through the A/C Solutions offering. The May bill insert was sent to 110,000 customers between May 2 and May 31.

On May 26, the May-June campaign launched. The May-June campaign consisted of a postcard, lead generation email, did-not-open email and did-not-click email. The campaign targeted any customer who had not yet scheduled an assessment or received an LED Kit. Customers were also targeted based on the ZIP code they lived in. The ZIP codes used included: 70112, 70113, 70115, 70116, 70117, 70118, 70119, 70125, 70130, 70122, 70124, 70126, 70127, 70128, 70129, 70148. The campaign started with the lead generation email sent on May 26 to 63,875 customers and followed by the postcard mailed on May 31 to 4,791. The did not open and did not click emails were sent June 19. The second portion of the campaign kicked off with the postcard that was mailed on June 15 to 4,980 customers. It was followed a week later on June 22 by the lead generation email. The did not open and did not click emails were sent after the lead generation email on July 12.

Table 22.7: May-June Campaign Results

CHANNEL	IN-MARKET DATE	IMPRESSIONS/ SENDS	AUDIENCE REACH/ OPENS	OPEN RATE	CLICKS	CLICK-THROUGH RATE
Lead Generation Email – Drop 1	May 26, 2023	63,875	8,039	12.97%	241	0.39%
Postcard – Drop 1	May 31, 2023	4,791	N/A	N/A	N/A	N/A
Did Not Open Email – Drop 1	June 19, 2023	58,781	3,560	6.25%	208	.37%

Did Not Click Email – Drop 1	June 19, 2023	5,238	2,253	42.56%	101	1.91%
Postcard – Drop 2	June 15, 2023	4,980	N/A	N/A	N/A	N/A
Lead Generation Email – Drop 2	June 22, 2023	57,100	7,272	12.93%	269	.48%
Did Not Open Email – Drop 2	July 12, 2023	51,389	4,880	9.63%	212	.42%
Did Not Click Email – Drop 2	July 12, 2023	5,028	2,800	55.74%	108	2.15%

In June, the team launched point-of-purchase (POP) signage for a select group of mail-in rebate products. The goal of the new POP is to help encourage more customers to take advantage of the rebates offered by the Energy Smart program.

On July 21, the Q3 digital campaign launched and targeted customers in the Entergy New Orleans territory. The digital campaign consisted of Google Search and Google Display ads. The messaging for both ads focused on the A/C Solutions offering and the rebates on retail appliances as secondary messaging.

Table 22.8: Q3 Digital Campaign Results

CHANNEL	IN-MARKET DATE	IMPRESSIONS/ SENDS	AUDIENCE REACH/ OPENS	OPEN RATE	CLICKS	CLICK-THROUGH RATE
Google Search ad	July 21- September 30, 2023	5,505	n/a	n/a	597	10.84%
Google Display ads	July 21- September 30, 2023	936,183	n/a	n/a	783	.08%

On July 28, the team launched the Q3 campaign, focusing on A/C Solutions. The campaign consisted of a postcard, lead generation email, did-not-open email and did-not-click email. The campaign targeted any customer who had not had an A/C tune-up in the last two years, including customers who had not previously participated in the offering. Customers were also targeted based on the ZIP code they lived in. Drop 1 was sent to customers who lived in 70129, 70128 70127, 70126, 70117,70148. Drop 2 was sent to customers who lived in zip codes 70122,70124, 70119, 70116, 70112, 70113, 70130, 70115, 70125, 70118 and Drop 3 was sent to 70114, 70131. The campaign kicked off on July 28 with a postcard sent to 12,404 customers, followed up by an email that was sent on August 15 to 32,411 customers. The did not open and did not click emails were sent on August 23. The second portion of the campaign kicked off with email on August 25 to 76,831 customers. The did not open and did not click emails were sent a week later on August 29. The final postcard was mailed on September 7 to 2,553 customers.

Table 22.9: Q3 Campaign Results

CHANNEL	IN-MARKET DATE	IMPRESSIONS/ SENDS	AUDIENCE REACH/ OPENS	OPEN RATE	CLICKS	CLICK-THROUGH RATE
Direct Mail- Postcard – Drop 1 & 2	July 28, 2023	12,404	n/a	n/a	n/a	n/a
Lead Generation Email – Drop 1	August 15, 2023	32,411	5,744	17.94%	544	1.70%
Did Not Open Email – Drop 1	August 23, 2023	28,406	2,175	7.75%	110	.39%
Did Not Click Email – Drop 1	August 23, 2023	3,360	1,646	49.2%	58	1.73%
Lead Generation Email – Drop 2	August 25, 2023	76,831	14,931	19.62%	975	1.28%
Did Not Open Email – Drop 2	August 29, 2023	67,822	5,750	8.59%	228	.34%
Did Not Click Email – Drop 2	August 29, 2023	8,158	4,501	55.17%	100	1.23%
Direct Mail Postcard- Drop 3	September 7, 2023	2,553	n/a	n/a	n/a	n/a

On October 1, the Q4 digital campaign launched and targeted customers in the Entergy New Orleans territory. The digital campaign consisted of Google Search and Google Display ads. The messaging for both ads focused on the Home Performance with ENERGY STAR® offering and the portfolio of residential offerings as secondary messaging.

Table 22.10: Q4 Digital Campaign Results*

CHANNEL	IN-MARKET DATE	IMPRESSIONS/ SENDS	AUDIENCE REACH/ OPENS	OPEN RATE	CLICKS	CLICK-THROUGH RATE
Google Search ad	October 1-December 31, 2023	4,552	n/a	n/a	664	14.59%
Google Display ads	October 1-December 31, 2023	1,090,674	n/a	n/a	1,068	.1%

In November, the Energy Smart team produced a bill insert. The two-sided bill insert showcased the benefits of scheduling a Home Performance with ENERGY STAR® assessment, along with the new products and rebates available through the newly launched residential online marketplace. The November bill insert was sent to 110,000 customers between November 1 and November 30.

In December, the Q4 email campaign was launched, encouraging customers to schedule a Home Performance with ENERGY STAR® assessment and take advantage of rebate opportunities available on energy-efficient products in-store or on the Energy Smart online marketplace. The campaign consisted of a lead generation email and remarketing email. The campaign targeted any customer who lived in the Entergy New Orleans territory who had not had an assessment, focusing on high energy users and customers who may need bill assistance. Customers were also targeted based on the ZIP code they lived in and divided into two drops. The zip codes used included Drop 1: 70112, 70113, 70114, 70115, 70116, 70117, 70119, 70125, 70126, 70127, 70129 and Drop 2: 70118, 70122, 70124, 70128, 70130, 70131, 70139, 70146, 70163, 70170, 70148 The campaign kicked off on December 6 with the first lead generation email sent to 85,401 customers and followed up a week later by an email that was sent on December 11 to 70,189 customers. The second portion of the campaign kicked off on December 8 with a lead generation email sent to 102,065 customers and the remarketing email following a week later December 14.

Table 22.11: Q4 Campaign Results

CHANNEL	IN-MARKET DATE	IMPRESSIONS/ SENDS	AUDIENCE REACH/ OPENS	OPEN RATE	CLICKS	CLICK-THROUGH RATE
Lead Generation Email – Drop 1	December 6, 2023	85,401	20,806	24.68%	371	.44%
Remarketing Email – Drop 1	December 11, 2023	70,189	5,131	8.19%	345	.55%
Lead Generation Email – Drop 2	December 8, 2023	102,065	11,506	11.47%	336	.33%
Remarketing Email – Drop 2	December 14, 2023	57,755	5,760	11.24%	131	.26%

On December 18, the Q4 Trade Ally newsletter was sent to 15 trade allies. The newsletter included information about the program's progress to its goals, training updates, reminders regarding year end tasks and to prepare for the upcoming 2024 program kick-off meeting.

Table 22.12: Residential Emails

EMAIL NAME	IN-MARKET DATE	IMPRESSIONS/ SENDS	AUDIENCE REACH/ OPENS	OPEN RATE	CLICKS	CLICK-THROUGH RATE
A/C Tune-Up Survey - January 2023	January 30, 2023	16	2	15.38%	1	6.25%
EE Kit Survey - January 2023	January 30, 2023	22	10	100%	3	14.29%
HPwES Survey - January 2023	January 30, 2023	112	28	38.36%	10	9.01%
IQW Survey - January 2023	January 30, 2023	193	47	37.01%	19	10.22%
OLM Survey - January 2023	January 30, 2023	57	13	44.83%	3	5.66%
OLM Survey - May 2023	May 18, 2023	215	47	32.64%	10	4.69%
IQW Survey - May 2023	May 18, 2023	297	57	26.39%	29	10.10%
HPwES Survey - May 2023	May 18, 2023	226	64	46.72%	20	8.97%
EE Kit Survey - May 2023	May 18, 2023	110	34	47.89%	9	8.18%
A/C Tune-Up Survey - May 2023	May 18, 2023	134	20	21.51%	7	5.51%
Q4 Trade Ally Newsletter- December 2023	December 18, 2023	20	13	70.59%	4	21.05%
A/C Tune-Up Survey - December 2023	December 19, 2023	166	65	39.15%	2	1.2%
HPwES Survey - December 2023	December 19, 2023	202	73	36.16%	9	4.45%
IQW Survey - December 2023	December 19, 2023	369	118	31.97%	3	1.46%

Table 22.13: Circuit Newsletter Metrics

DATE	SCHEDULED RECIPIENTS	OPEN RATE	CLICK-TO- OPEN RATE	UNIQUE OPENS	UNIQUE CLICKS	CLICK-THROUGH RATE
January February	January and February Results were not available by Entergy Operating Company					
March	83,986	42.57%	1.26%	35,613	448	0.54%
April	84,574	47.12%	1.57%	39,681	623	0.74%
May	84,830	48.20%	1.83%	40,719	747	0.88%
June	85,335	46.43%	2.19%	36,808	991	1.04%
July	85,954	46.43%	2.53%	39,435	997	1.16%
August	87,007	46.06%	1.92%	37,463	721	0.83%
September	87,620	43.23%	1.18%	45,264	534	0.61%
October	88,176	51.87%	1.23%	45,501	558	0.64%
November	88,867	51.79%	1.21%	38,604	469	0.53%
December	194,915	43.64%	1.50%	85,743	1,282	0.66%

Appliance Replacement and Recycling

All collateral and marketing pieces for this program offering were rebranded in Q1 and Q2. Marketing efforts included a media mix of paid search, paid social, outreach events and email campaigns. In-store signage efforts were ceased due to an influx of feedback from appliance stores stating the Energy Smart Appliance Recycling offering would interfere and compete with their appliance hauling services.

Forecasting for search generated leads was conducted early in the year and it was determined the offering needed a presence on Google. The marketing team facilitated the creation and verification of the appliance recycling google business account which completed the verification process in October 2023.

This process was extensive and required our team to create an Appliance Recycling logo that is now displayed on the front door at the Legacy Professional Services office. This account allows the Energy Smart Appliance Recycling offering to populate local search engine optimization searches in the New Orleans area with targeted keywords and ZIP codes. October-December the Google business account received roughly 1,200 viewers.

In September the marketing team created an online form in which Legacy Professional Services would receive requests for appliance recycles internally moving forward. During the process of bringing this offering internal, updates were made to the webpage to enhance the customer experience.

October - December the offering had a mix of paid social, paid google search, email campaigns and digital displays included in the Public Awareness Campaign. These three months the offering saw the highest number of recycles compared to the previous months.

The paid social campaign in Q4 concluded that the ads reached more women than men and close to 80% of impressions were delivered to people 45+. Reporting showed that people aged 18-44 respond lightly better to the recycling creative than people of ages 45+.

In addition to the above marketing efforts, the Energy Smart team partnered with several title companies in the New Orleans area to distribute promotional gift bags to new homeowners that included a piece of collateral highlighting Appliance Recycling, EasyCool, Online Marketplace and Home Performance with ENERGY STAR®. This effort received a very low return on investment. There are no leads that mention on the Appliance Recycling request form that the gift bags are how they heard about the offering. The piece of collateral included in the gift bags received approximately 12 QR code scans over a six-month span for each offering. This piece of collateral is now being used as a leave-behind for Home Performance with Energy Star and Income Qualified Weatherization assessments.

Appliance Recycling was featured in The Green Project's newsletters throughout the year. To continue supporting this partnership, Energy Smart was a sponsor at The Green Project's Salvation Gala in December 2023. The Green Project was unable to update their recycling guide in 2023 but has committed that the Appliance Recycling offering will be included when the next update occurs.

From the internal request form, entries received from September through December, the team able to collect data from customers about how they heard about the Appliance Recycling offering. Results show that the top performing lead came from emails at 33%, 19% search engine, 15% friends and family, 12% appliance store, 10% utility website, 4% energy advisor and 2% Facebook. Form entries do not include any leads that may have scheduled or reached out via phone or email.

Table 22.14: Appliance Recycling Metrics

Channel	IN-MARKET DATE	IMPRESSIONS/ SENDS	AUDIENCE REACH/ OPENS	OPEN RATE	CLICKS	CLICK-THROUGH RATE
Paid Social – Priority Census Zip Codes	July 14 – Aug. 31	16,301	6,902	-	492	3.02%
Paid Social – Parish	July 14 – Aug. 31	11,846	5,960	-	409	3.45%
Google Ad	Oct. 1 – Nov. 14	35,096	-	-	163	0.46%
Paid Social – Priority Census Zip Codes	Sept. 21 – Oct. 21	16,194	7,255	-	289	1.78%
Paid Social – Parish	Sept. 21 – Oct. 21	8,943	5,350	-	178	1.99%
Energy Awareness Month Email – Drop 1	October 25, 2023	37,136	15,694	42.3%	71	0.2%
Energy Awareness Month Email – Drop 2	October 31, 2023	37,149	16,270	43.8%	114	0.3%

Table 22.15: Appliance Recycling Google Business Metrics

PROFILE INTERACTIONS	PROFILE VIEWS	DIRECTIONS	WEBSITE CLICKS	CALLS	MOBILE SEARCH	DESKTOP SEARCH
279	1,222	230	39	10	36%	55%

Peak Time Rebate

The Energy Smart team supported the launch of the Peak Time Rebate Demand Response Pilot with several marketing efforts in Q2 and the beginning of Q3 targeting low-income and/or high energy usage households. Three recruitment emails were drafted and deployed over the span of two months, with the support of remarketing emails to customers who did not open and did not engage. Recruitment and remarketing emails were sent every two weeks.

Throughout the span of recruitment, subject lines, send times and creatives were analyzed to identify which performed the best and was most effective regarding enrollment requests per campaign. The analysis of each campaign's reporting before sending out the next is responsible for the increase of success with each campaign as the recruitment efforts continued. This is supported in the Peak Time Rebate metrics chart below.

In June, the marketing team drafted and distributed a circuit article, Entergy New Orleans Residential, monthly e-newsletter, featuring the pilot and enrollment information. A press release was also distributed to local media outlets the last week in June and received coverage July 12 from WGNO, Ground News and Spot on Louisiana. Due to the press release issue dates aligning between email communications, the team estimates approximately 26 enrollment leads were acquired from the press release coverage.

Recruitment marketing efforts began May 25, 2023, and ended July 14, 2023, resulting in 3,236 enrollment requests in the over the span of approximately fifty days. The pilot was originally offered to the first 2,000 residential customers who requested enrollment and met eligibility requirements. After reconsideration of the max capacity, the pilot supported 2,700 participants and only received 39 unsubscribes during the demand response summer season.

At the end of the season a survey was emailed to participants in which 61% of customers who completed the survey stated text message is the preferred way to be notified and reminded of events. 28% chose email and 11% stated text and email.

Table 22.16: Peak Time Rebate Metrics

Channel	IN-MARKET DATE	IMPRESSIONS/ SENDS	AUDIENCE REACH/ OPENS	OPEN RATE	CLICKS	CLICK-THROUGH RATE	ENROLLMENT TOTAL
Lead recruitment email – Drop 1	May 25, 2023	62,446	16,268	17.8%	1,372	1.3%	136
Did not click remarket email – Drop 1	June 8, 2023	61,505	10,361	16.8%	534	0.9%	-
Did not open remarket email – Drop 1	June 8, 2023	51,437	4,103	8.0%	160	0.3%	568
(A/B testing) Recruitment Email – Drop 2	June 23, 2023	11,378	8,193	72.0%	225	2.0%	794
Zip Code Targeting – Drop 3	July 7, 2023	50,643	19,297	38.10	802	1.6%	1246
Did not click remarket email – Drop 3	July 14, 2023	17,702	13,740	77.6%	501	2.8%	-
Did not open remarket email – Drop 3	July 14, 2023	101,053	47,976	47.5%	3,621	3.6%	3236

EasyCool

The EasyCool offering marketing launched in Q2 during cooling season. Marketing efforts for this offering include paid social media, recruitment email marketing and a new table display for outreach events. The new booth display includes a scannable QR code which directs customers to a newly updated webpage. Webpage edits focused on added emphasis to the "Enroll Now" button. Paid social reporting in Q4 resulted in over 80% of impressions delivered to people aged 45+.

The offering was included in multiple collaborative efforts. Mid-year it was implemented that all Energy Smart residential email communications that include advertising of smart thermostats will include verbiage featuring EasyCool. Prior to the launch of pre-enroll in EasyCool, banners were added in rotation on the Online Marketplace. In addition to those collaborative efforts, the EasyCool offering is included on a new leave-behind for Home Performance with ENERGY STAR and Income-Qualified Weatherization assessments. This piece of collateral was also included in gift bags that were distributed to title companies in New Orleans to gift to new homeowners.

Table 22.17: EasyCool Metrics

CHANNEL	IN-MARKET DATE	IMPRESSIONS/ SENDS	REACH/OPENS	OPEN RATE	CLICKS	CLICK-THROUGH RATE
EasyCool Kick-off Paid social	March 13 – March 31	137,054	79,838	---	137	0.09%
Paid social	April 4 – April 26	24,405	11,156	---	622	2.55%
Enrollment Email	March 27, 2023	5,505	---	55.9%	189	2.5%
Earth Day Email	April 20, 2023	61,832	10,455	16.9%	253	0.4%
Pre-Season Reminder	June 9, 2023	4,754	2,926	61.5%	0	0
Purchasers not enrolled - Email	July 13	4,543	2,409	53.0%	93	2.0%
Paid Social	July 14 – Sept. 30	77,725	22,351	---	1,820	2.34%
Winter Paid Social	Dec. 19 – Dec. 31	160, 111	57,875	---	1,718	1.07%

In December, the team launched customer pre-enrollment reminder emails. As of October 6, customers are able to pre-enroll in the EasyCool program and receive an instant rebate when they purchase a smart thermostat from the Online Marketplace. This on-going campaign includes a series of 3 emails encouraging customers to install their smart thermostat to complete enrollment.

Table 22.18: EasyCool Pre-Enrollment Reminder Email Metrics

CHANNEL	IN-MARKET DATE	IMPRESSIONS/ SENDS	OPENS	OPEN RATE	CLICKS	CLICK-THROUGH RATE
Reminder 02- Email	December 1, 2023	11	8	73%	4	36.3%
Welcome 01- Email	December 19, 2023	26	24	92%	7	26.9%
Reminder 02- Email	December 19, 2023	33	31	94%	6	18.1%
Final notice 03- Email	December 19, 2023	11	9	82%	3	27.2%

Energy Smart Online Marketplace

Throughout 2023, the team promoted the Energy Smart Online Marketplace by using email marketing, Facebook ads, Google Shopping ads, homepage online store banners, bill inserts, a video ad and postcard. These tactics were used to create awareness for marketplace offerings, product promotions and the duration of the promotions.

For the first six months of the year, the team focused on promoting the LED discounts and the no-cost energy-efficiency kit available on the Online Marketplace, sending out 1,578 kits in 2023.

Each campaign utilized email marketing that included a lead generation email, which first notified customers of marketplace promotions and their timeframes. Remarketing emails were used as reminders for customers to act on the promotion before it ended.

A Facebook ad was used to help promote the new Amazon smart thermostat being added to the marketplace. The ad brought in 200 users during its short runtime. Digital ads have been an ongoing tactic. This includes Google Shopping ads, Facebook ads and additionally through a partnership with Google in Q4; video ads on Hulu and Youtube. Marketplace discounts were also promoted via homepage online store banners. For each promotion, a homepage banner was created and added to the homepage of the marketplace. The banners included imagery pertaining to the discount, a message on the promotion and its duration.

In the month of October, the team launched the new Online Marketplace to enhance the customer experience. New products such as smart thermostats, luxury water-savers, air-purifiers, and dehumidifiers were added to the marketplace. In addition to new products, new features such as a customer service online chat, the ability to pre-enroll in the EasyCool demand response program and receive instant rebates at the point of purchase are now available on the Online Marketplace. Email, a bill insert and messaging in the Circuit newsletter were used to promote the new customer benefits of the online marketplace.

At the end of 2023, the online marketplace reached 33% of the annual thermostat goal of 5,200 thermostats and 90% of the annual LED goal of 9,000 LEDs. The Google Nest Thermostat was the most popular thermostat, with 896 sold. The Sensi smart thermostat was the second most popular thermostat with more than 418 sold. Overall, the marketplace achieved a returning customer rate of 23.54% and a 7.00% conversion-rate average.

Table 22.18: Online Marketplace Promotions

PROMOTION NAME	RUN DATES	PRODUCTS PROMOTED
LED PROMOTION	January 18-March 1, 2023	Standard LEDs
WINTER HELPFULNESS PROMOTION	February 15-March 1, 2023	Specialty LEDs, Google Nest Thermostat, Google Nest Learning Thermostat
EARLY SPRING PROMOTION	March 2-March 29, 2023	ecobee3 lite, ecobee Enhanced, ecobee Premium, Standard LEDs, Indoor Water Savers
EARTH DAY PROMOTION	April 10-25, 2023	Google Nest Thermostat, Google Learning Thermostat, Emerson Sensi, Emerson Sensi Touch, Flood LEDs, Advanced Power Strip, Amazon Smart Thermostat

MEMORIAL DAY PROMOTION	May 22-July 5, 2023	Emerson Sensi, Emerson Sensi Touch, ecobee3 lite, Standard LEDs
FATHER'S DAY/FOURTH OF JULY PROMOTION	June 21-July 14, 2023	ecobee3 lite, ecobee Enhanced, ecobee Premium, Google Nest Thermostat, Google Nest Learning Thermostat
SUMMER HELPFULNESS PROMOTION	August 1-August 21, 2023	Google Nest Thermostat, Google Nest Learning Thermostat
LABOR DAY PROMOTION	August 28- September 5, 2023	Emerson Sensi, Emerson Sensi Touch, ecobee3 lite, Indoor Water Savers
ENERGY AWARENESS/ NEW MARKETPLACE LAUNCH PROMOTION	September 25 – October 20, 2023	Standard LEDs, Indoor Water Savers, ecobee3 lite, ecobee Enhanced, ecobee Premium, Google Nest Thermostat, Google Nest Learning Thermostat, Flood LEDs, Advanced Power Strip, Emerson Sensi and Sensi Touch
BLACK FRIDAY/CYBER MONDAY PROMOTION	November 6 – December 15, 2023	Emerson Sensi, Emerson Sensi Touch 2, ecobee3 lite, ecobee Enhanced, ecobee Premium, Google Nest Thermostat, Google Nest Learning Thermostat
HOLIDAY SEASON PROMOTION	December 6- December 31, 2023	Standard LEDs, Indoor Water Savers, ecobee3 lite, Google Nest Thermostat, Google Nest Learning Thermostat, Emerson Sensi, Emerson Sensi Touch 2

Table 22.19: Online Marketplace Emails and Digital Ads

EMAIL NAME	IN-MARKET DATE	IMPRESSIONS/ SENDS	AUDIENCE REACH/ OPENS	OPEN RATE	CLICKS	CLICK-THROUGH RATE
Energy-Efficiency Kit + Lighting – Lead Generation Email	January 20, 2023	25,000	3,885	24.03%	956	3.89%
Energy-Efficiency + Lighting - Remarketing Email	January 31, 2023	49,995	7,402	22.51%	1,643	3.35%
Google Shopping Ads	March 3, 2023- December 31, 2023	43,097	n/a	n/a	901	2.09%
February 2023 Campaign – Lead Generation Email	February 24, 2023	61,439	7,600	19.05%	2,009	3.32%
February 2023 Campaign – Remarketing Email	February 28, 2023	51,898	3,797	11.26%	920	1.79%
Energy-Efficiency Kit – Lead Generation Email	March 9, 2023	3,026	538	26%	121	4.20%
March 2023 Campaign – Lead Generation Email	March 17, 2023	67,573	6,076	13.46%	278	0.41%
March 2023 Campaign – Remarketing Email	March 23, 2023	50,485	3,420	10.52%	139	0.28%
Facebook Ad	March 23-April 23, 2023	17,614	N/A	N/A	523	2.87%
Earth Day Promo Campaign – Lead Generation Email	April 12, 2023	63,078	6,124	15.04%	339	0.55%
Earth Day Promo Campaign – Remarketing Email	April 22, 2023	56,609	2,091	5.69%	112	0.20%

Memorial Day Promo Campaign – Lead Generation Email	May 30, 2023	61,945	4,687	10.95%	426	0.70%
Memorial Day Promo Campaign – Remarketing Email	June 6, 2023	56,021	2,931	7.77%	418	0.75%
LED Discount Going Away Campaign – Lead Generation Email Send 1	June 15, 2023	66,936	4,120	8.60%	363	0.55%
LED Discount Going Away Campaign – Lead Generation Email Send 2	June 16, 2023	54,302	2,360	6.02%	324	0.71%
LED Discount Going Away Campaign – Remarketing Email	June 21, 2023	73,744	1,763	2.4%	215	.29%
Father's Day/ Fourth of July Promo – Lead Generation Email	June 23, 2023	61,497	7,645	12.59%	293	.48%
Father's Day/ Fourth of July Promo- Remarketing Email	July 4, 2023	55,889	7,187	12.91%	486	.86%
Summer Helpfulness- Lead Generation Email	August 17, 2023	69,276	11,468	19.53%	513	.87%
Summer Helpfulness- Remarketing Email	August 25, 2023	59,040	11,801	20.17%	489	.84%
Labor Day Promo- Lead Generation Email	August 28, 2023	59,951	7,277	12.45%	261	.45%
Labor Day Promo- Remarketing Email	September 5, 2023	53,780	7,502	13.98%	357	.67%
Energy Awareness/New Marketplace Launch- Lead Generation Email	September 29, 2023	58,711	7,814	13.45%	341	.59%
Energy Awareness/ New Marketplace Launch- Remarketing Email	October 2, 2023	58,646	7,726	13.31%	327	.56%
Energy Awareness/ New Marketplace Launch- Lead Generation 2 Email	October 6, 2023	112,148	15,508	14.01%	764	.69%
Energy Awareness/ New Marketplace Launch- Remarketing Email	October 11, 203	53,488	3,593	6.79%	119	.22%
Energy Awareness/ New Marketplace Launch- Remarketing Email	October 20, 2023	58,299	6,987	12.1%	255	.44%
Black Friday/Cyber Monday Promo- Lead Generation Email	November 21, 2023	58,126	11,675	20.3%	157	.27%
Black Friday/Cyber Monday Promo- Remarketing Email	November 24, 2023	58,017	6,481	11.28%	200	.35%
Black Friday/Cyber Monday Promo- Remarketing Email	November 28, 2023	57,932	5,362	9.34%	124	.22%
Holiday Season (Google) Promo- Postcard	November 28-December 6, 2023	49,971	n/a	n/a	n/a	n/a
Holiday Season (Google) Promo- Hulu Ad	December 5-December 20, 2023	241,240	n/a	n/a	n/a	n/a
Holiday Season (Google) Promo- Youtube Ad	December 5- December 27, 2023	202,463	n/a	n/a	787	.39%
Holiday Season Promo- Lead Generation Email	December 14, 2023	57,755	5,760	11.24%	131	.26%
Holiday Season Promo- Remarketing Email	December 19, 2023	54,047	3,618	6.78%	113	.21%
Holiday Season Promo- Remarketing Email	December 27, 2023	51,883	2,328	4.54%	90	.18%

Marketing Collateral

- General Energy Smart Overview Handout (English).
- General Energy Smart Overview Handout (Spanish).
- General Energy Smart Overview Handout (Vietnamese).
- Rebate Forms.
    - A/C Tune-Up Rebate Form.
    - Central A/C Rebate Form.
    - Duct Efficiency Improvement Rebate Form.
    - HPwES and MF Attic Insulation and Air Infiltration Reeducation Rebate Form.
    - IQW Attic Insulation and Air Infiltration Reeducation Rebate Form.
    - IQW Duct Efficiency Improvement Rebate Form.
    - Air Purifier Rebate Form.
    - Dehumidifier Rebate Form.
    - Freezer Rebate Form.
    - Heat Pump Water Heater Rebate Form.
    - Pool Pump Rebate Form.
    - Refrigerator Rebate Form.
    - Smart Thermostat Rebate Form.
    - Trade Ally Smart Thermostat Rebate Form.
    - Water Cooler Rebate Form.
    - Window A/C Rebate Form.
- Customer Satisfaction Surveys.
    - Home Performance with ENERGY STAR Satisfaction Survey.
    - Income-Qualified Weatherization Satisfaction Survey.
    - A/C Tune-Up Satisfaction Survey.
    - Energy Smart Online Marketplace Satisfaction Survey.
    - Energy Efficiency Kits Satisfaction Survey.
- Sensi Smart Thermostat Leave Behind.
- HPwES and IQW Sorry We Missed You Door Hanger.
- Multifamily Sorry We Missed You Door Hanger.
- Multifamily Broken Item Leave Behind.
- Multifamily Landlord Permission Form.
- Multifamily Direct Install Service Agreement.
- Multifamily Program Sell Sheet.
- Multifamily Tenant Leave Behind.
- Multifamily Tenant Notification Flyer.
- Retail Employee Education Flyer.
- Four-Pack LED Bulb Giveaway Label.
- Energy Efficiency Kit Label.
- Energy Efficiency Kit Insert.
- Air Purifier Rebate Landing Page
- Smart Thermostat Rebate Landing Page.
- Dehumidifier Rebate Landing Page.
- Water Cooler Rebate Landing Page.
- Heat Pump Water Heater Landing Page.
- Freezer Rebate Landing Page.
- Refrigerator Rebate Landing Page.
- Pool Pump Rebate Landing Page.

- Window A/C Rebate Landing Page.
- Trade Ally Rebate Forms Landing Page.
- HERs Reports.
- CEP Widget.
- Vehicle Magnet.
- Point of Purchase Signage.
- Appliance Recycling rack card.
- Appliance Recycling flyer.

Marketing Tactics

- Google Search and Display.
- Paid Social.
- Bill Insert.
- Postcard.
- Email.
- Circuit E-Newsletters Content.
- Home Performance with ENERGY STAR® Campaign Materials.
- LED Kit and Follow-Up Campaign Materials.
- A/C Solutions Campaign Materials .
- Trade Ally Emails.
    - Q4 Newsletter.
- My Rewards Emails.
- Online Marketplace Promotions.
    - Energy Efficiency Kit
    - Email
    - Onsite banner.
    - Paid Social.
    - Circuit E-Newsletters Content.
    - November Bill Insert
    - Holiday Paid Digital- Hulu and Youtube (Google Promotion Only)
    - Holiday Postcard (Google Promotion Only)
    - EasyCool Pre-Enrollment Customer Reminder Email.

Residential Customer Satisfaction

Understanding program performance and customer satisfaction are vital to the success of the Energy Smart program. The team surveyed customers to gauge satisfaction with various elements such as the program in general, process for participating, the staff or trade ally they worked with and their energy-efficient upgrade. The team reviews customer satisfaction survey results quarterly to ensure that program satisfaction remains high and continuously improves the customer journey. Customer satisfaction across all programs showed positive responses, with most customers highly likely to recommend Energy Smart to their friends or colleagues. Detailed customer responses highlighted their appreciation of the professionalism and knowledge of the Energy Advisor, their satisfaction with the offerings and their interest in additional opportunities to lower their bills and save more energy.

Across the residential offerings, customer satisfaction regarding the service, installation and safety averaged scored between seven and ten, with ten indicating very high satisfaction. The team will use the motivational responses received by customers in PY13 to inform strategies to increase customer engagement in PY14. These motivators included saving money on their utility bill, the no-cost direct install items and assessment and helping the environment. Customer home assessment report emails and Online Marketplace follow-up emails will provide additional opportunities in PY14.

Table 22.20: Customer Satisfaction Survey Results – HPwES/IQW/MF

QUESTION	HPWES	IQW	MF
Overall, how satisfied are you with the offering?	7.2	8.4	9.8
How satisfied were you with the professionalism of the energy advisor?	8.7	8.8	9.8
How satisfied were you with the energy advisor's knowledge about the products installed and ability to answer your questions?	8.8	8.9	9.8
How satisfied are you with the safety measures taken by the energy advisor? (Used ladder, wore gloves, had on safety glasses, etc.).	8.9	8.8	10
How likely are you to implement changes recommended by the energy advisor?	7.7	8.5	N/A
How satisfied were you with the enrollment and scheduling process?	8.1	8.5	N/A
How likely is it that you would recommend the program to a friend or colleague?	7.4	8.9	N/A
Top motivation for participating in the offering.	Wanted to reduce my utility bill.	Wanted to reduce my utility bill.	Wanted to reduce my utility bill. Items and audit were free.

**Scoring is based on question response average.*

Table 22.21: EasyCool Customer Satisfaction Survey Results

QUESTION	EASYCOOL SCORES*
Overall, how satisfied are you with the offering?	8.9
How satisfied were you with the enrollment process?	9.4

QUESTION	EASYCOOL SCORES*
How satisfied were you with the time it took to receive your incentive?	8.8
How likely is it that you would recommend the offering to a friend or family member?	9.2
What was your top motivation for participating in the offering?	Wanted to reduce my utility bill.

Scoring is based on question response average

Table 22.22: A/C Tune-Up Customer Satisfaction Survey Results

QUESTION	A/C TUNE-UP SCORES*
Overall, how satisfied are you with the A/C Tune-Up offering?	8.8
How satisfied were you with the professionalism of the trade ally?	8.8
How satisfied were you with the quality of service provided by your trade ally?	8.8
How satisfied were you with the enrollment and scheduling process?	8.9
How likely is it that you would recommend the program to a friend or colleague?	8.9
How satisfied were you with the trade ally's knowledge and ability to answer your questions?	8.7
How satisfied are you with the safety measures taken by the trade ally? (Used ladder, wore gloves, had on safety glasses, etc.)	8.9
Top motivation for participating in the offering.	Wanted to reduce my utility bill.

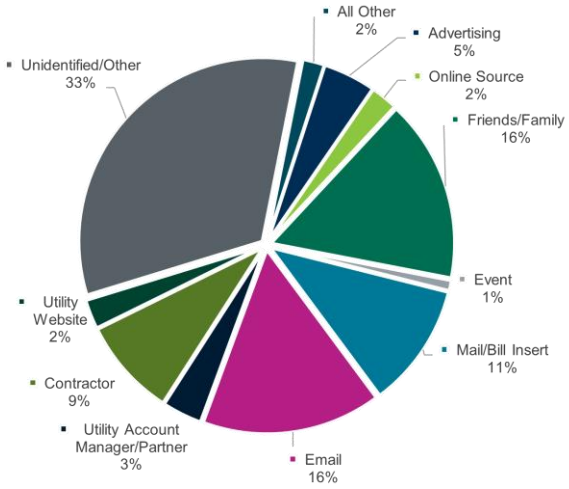
Scoring is based on question response average.

Table 22.23: Appliance Recycling Customer Satisfaction Survey Results

QUESTION	AR&R SCORES*
Overall, how satisfied were you with your experience with the Energy Smart Appliance Recycling offering?	9.72
How satisfied were you with the scheduling process?	9.45
How satisfied were you with the team that removed your old refrigerator or freezer?	9.90
How likely are you to participate in other Energy Smart residential offerings?	9.90
How likely is it that you would recommend the program to a friend or family member?	9.90
What motivated you to participate in the offering?	$50 rebate

Scoring is based on question response average.

Graph 22.24: Lead Sources



*All Other is a combination of Web Request (0.22%), Radio (0.07%),Search Engine (0.22%), Social Media (0.33%), Billboard (0.11%), Newsletter (0.14%), Door to Door Canvassing (0.18%), Newspaper (0.07%), and TV (0.47%).

The Energy Smart team tracked residential customer participation using identified lead marketing sources for customers that included community events/outreach, tabling at customer care centers, email, friends and family/word-of-mouth marketing, direct mail, utility referrals, social media, the Energy Smart website and traditional advertising. The highest performing lead sources for PY13 included referral sources such as contractor and family and friends. Email and mail/bill inserts continued to be popular and consistent channels through PY13. The team will continue to expand customer reach via email and drive traffic to the program website.

Planned or Proposed Changes

EasyCool Demand Response offering will be supported with additional incentives on major holidays for select customers, banners throughout the year on the residential online marketplace, promoted in residential marketing communications that market smart thermostats and paid/organic social media. A new tactic the team will test to reach customers to customers on a quarterly basis that have purchased a smart thermostat but have not enrolled it in EasyCool with text and email communications.

Appliance Recycling marketing will focus on paid keyword search, organic social media posts on Entergy New Orleans social channels, customer testimonials, customer surveys, email communications, articles in the Entergy New Orleans Circuit Newsletter and cross promotional opportunities with appliance retailers, charitable, community and government organizations.

For the Home Performance with ENERGY STAR, Income Qualified-Weatherization and A/C Solutions offerings, the team will focus on targeted efforts utilizing direct mail, email marketing, Google search and display ads, paid social media ads, organic social media, bill inserts and articles in the Entergy New Orleans Circuit Newsletters. In addition, the team will focus on cross promotional opportunities with local and community-based organizations and in person outreach.

Residential Appliances offering will continue to utilize point-of-purchase signs for qualified energy-efficient products. New tactics will include a leave behind to cross promote with customers when they participate in the Appliance Recycling offering to add convenience to submitting appliance rebates.
The Energy Smart Online Marketplace will focus on email marketing, onsite banners, direct mail, paid social and Google Shopping ads. The team will also focus increased energy-saving opportunities with manufacturer promotions on the marketplace.

Community Outreach

The PY13 community outreach strategy included attending live and virtual meetings run by community groups, offering additional job training opportunities, inviting community members to monthly Energy Smart-hosted virtual briefings about the program, typical in-person tabling events and small business canvassing. The team offered flexible content options to community groups, ranging from five-minute briefings to 60-minute energy efficiency lessons for maximum community impact. In PY13, community outreach was conducted at over 109 events, gaining visibility with over 17,000 community members.

Several nonprofits and community groups hosted Energy Smart community outreach staff throughout the year to present to meetings or table at events. These groups included The New Orleans Chamber of Commerce, Central Circle, Jericho Road, Entergy Customer Care Centers, City of New Orleans Rental Assistance events, Joe Brown Park, OC Haley Merchant's Association, Ashe' Cultural Arts Center and Power House, Viet, City of New Orleans Safety and Permits, Dillard University, Rebuild Together, The Green Project, The City of New Orleans Office of Neighborhood Engagement, AmeriHealth, and Southern University of New Orleans.

"Power Trip: Your Journey to Energy Efficiency" continued to be offered by the program outreach team. Community members were invited to attend a 20-minute webinar on the Energy Smart program, followed by a question-and-answer session with an energy expert that provided individuals with information specifically for their home energy needs.

Commercial Marketing and Outreach

Highlights

During PY13, the Energy Smart team developed and implemented marketing campaigns to support the 25% Bonus Incentive, Small Business Energy Assessment, Q3/Q4 Bonus and the Small Business Online Marketplace offerings. In total, the Energy Smart team implemented 11 marketing campaigns that delivered 8.53 million impressions; reaching 1.22 million; generated 40,326 clicks to the website and 234 project form submissions. Form submissions included 66 small business energy assessments and 168 project inquiry and requesting a call from an energy advisor.

The campaigns were supported with a mix of print, digital display, paid social, radio, digital audio, email and earned media. The top sources of page views to the business landing page between July 1 – December 31 were the dedicated eblasts from Biz New Orleans and NOLA.com., business targeted digital ads from the public awareness campaign and paid social ads. The top sources of page views to the small business landing page were digital display ads, NOLA.com dedicated eblast, NOLA.com on-site digital display ads, and the NOLA.com/Times-Picayune sponsorship.

Earned media was secured throughout PY13. The 25% bonus incentive was picked up by Biz New Orleans and NOLA News Wire. Program partners NOLABA, StayLocal and Downtown Development District included content in their social media and e-newsletters. The small business energy assessment press release was picked up by Biz New Orleans, WGNO and The New Orleans Agenda. Program partners such as New Orleans Chamber of Commerce, Downtown Development District, StayLocal and City Councilman Eugene Greene included content in their social media and e-newsletters. The mayor's office distributed a press release on October 5, honoring Energy Efficiency Day, that mentioned the offerings from the Energy Smart program. Live on-air interviews were also secured. For Earth Day, Energy Smart appeared on WDSU and on September 19, Energy Smart was a guest on the WWL Newell Normand weekly radio program as a guest of Michael Hecht, CEO of GNO, Inc.

The Energy Smart team updated the programs' owned media channels throughout PY13. The website was updated to include the customer testimonial videos from Café Reconcile and LSU Health Science Center, 25% Bonus incentive messaging, 2023 program lighting and non-lighting calculators, small business energy assessment and compressed air leaks offerings. The team refreshed the creative for the small business kit labels and redesigned the window clings for business customers to display on their storefronts after completing an Energy Smart project. New program collateral was developed to support trade ally recruitment, the small business energy assessment and compressed air offerings and a warehouse sector sheet messaging the benefits of energy efficiency upgrades for warehouses was developed.

Program presentations were developed to reflect new offerings and presented at customer and program partner meetings to include Entergy New Orleans Customer Service Managers, GNO Inc., Greater New Orleans and Company, Downtown Development District and Algiers Economic Development Foundation. The program also participated as panelist at three Love Your City Keep It Clean NOLA events and in the 2023 Women in Construction Convening: Pathways to Profit seminar. Lastly, the Energy Smart team presented a large donation at the ribbon cutting ceremony for Poree's Embroidery on June 22.

The following advertising campaigns were launched throughout PY13.

- 25% Bonus Incentive
- Small Business Online Marketplace
    - Early Spring promotion
    - Earth Day promotion
    - Memorial Day promotion
    - July 4 promotion
    - Labor Day promotion
    - Energy Efficiency Month promotion
    - Black Friday promotion
    - Holiday promotion
- Small Business Energy Assessment
- Q3/Q4 Incentives

25% Bonus Incentive Campaign Details

The 25% bonus incentive campaign launched in January with an email campaign targeting large and small commercial customers. Paid media launched in March and ran through June an consisted of digital display, paid social, radio, digital audio, print, dedicated email campaigns with NOLA.com and Biz New Orleans and Energy Smart generated emails. After three months, the paid media ads generated 5.03M

impressions, reached 558,000 people and received 15,883 total clicks. By the end of Q2, 72 projects reserved the 25% bonus.

A press release was distributed to New Orleans media contacts highlighting the bonus. The story was picked up by Biz New Orleans and NOLA NewsWire. It also received newsletter inclusions and social media posts through program partners such as Chamber of Commerce, NOLABA, StayLocal, and Downtown Development District. Entergy New Orleans posted content on their social media pages and wrote an article about Café Reconcile partnering with Energy Smart to save more on their energy bill and posted it on the Entergy New Orleans newsroom.

The digital display ads launched on March 10 and ran through June 30. Two creative executions were developed. The first set of digital ads had LED imagery. The second had HVAC imagery. The ads delivered 640,618 impressions, generated 1,826 clicks to the business landing page and had click-thru-rates (CTR) exceeding the .14% benchmark. The LED creative execution had a click-thru-rate of .25% and the HVAC creative execution had a CTR of .29%.

The paid social media approach consisted of launching an awareness campaign to maximize media reach and to build a retargeting audience of people who engaged with the program. In April, the strategy pivoted to a traffic driving campaign resulting in higher click through rates, but lower audience reach. This type of campaign is geared towards increasing the frequency or number of times the ad is served. In June the strategy pivoted to test a lead generation format which produced 55 leads.

The Energy Smart team continued to utilize digital audio and the Biz Talks Podcast sponsorship and expanded the radio buy to include spots running on the WWL 105 FM traffic updates and on NFL Draft coverage. The :15 spot with music performed the best in the digital audio campaign.

QR codes were included in the print ads that ran in City Business Journal, Biz New Orleans and The Times-Picayune. The front-page strip ads on the business section of The Times-Picayune received 168,096 targeted impressions and reached 32,021 (44.2%) business decision makers in Orleans Parish.

Table 22.25: 25% Bonus Email Campaign Results

CUSTOMER LIST	IN-MARKET	IMPRESSIONS/SENDS	REACH/OPENS	OPEN RATE	CLICKS	CTR
C&I	January 6	11,082	4,561	42.5%	155	1.4%
Trade Ally	January 27	223	131	62.1%	35	16.6%
C&I	February 13	10,944	3,318	31.1%	96	.9%
C&I	March 9	7,581	2,535	33.7%%	85	1.1%
C&I	April 19	7,596	2,661	35.3%	44	.6%
C&I	May 31	11,215	3,083	28.2%	91	.8%

Table 22.26: 25% Bonus Paid Media Campaign Results

TACTIC	IN-MARKET DATE	IMPRESSIONS/ SENDS	AUDIENCE REACH/ OPENS	CLICKS/LEADS	CTR
Digital Display	March 10-June 30	640,618	105,343	1,826	.29%
Paid Social - Awareness	March 13-April 10	176,313	79,489	355	.20%
Paid Social - Traffic	April 11-May 31	68,774	21,606	2,913	4.24%
Paid Social - Leads	June 2-June 22	26,148	10,227	435/55	1.66%
WWL Radio Traffic Updates	April 3-June 30	2,822,400	215,300	N/A	N/A
Digital Audio	April 6-June 30	99,711	13,860	N/A	N/A
NFL Draft Radio	April 24-April 30	38 spots	N/A	N/A	N/A
NOLA Chamber E-Blast Digital Ad	April 3	N/A	2,444	N/A	N/A
NOLA Chamber E-Blast Digital Ad	April 17	N/A	2,070	N/A	N/A
City Business Print Ad	March 10	15,000	N/A	N/A	N/A
City Business Print Ad	March 24	15,000	N/A	N/A	N/A
City Business Daily Alert Ads	April 1	234,938	N/A	330	.12%
City Business Home Page Digital Ad	March 18-March 25	5,671	N/A	14	.25%
City Business Home Page Digital Ad	March 26-April 3	11,607	N/A	15	.13%
City Business Home Page Digital Ad	April 8-April 14	10,433	N/A	7	.07%
Times-Picayune Front Page Print Strip Ad	April 2 April 16 April 23 May 14 May 21	168,096 total of 5 insertions	32,021 total for 5 insertions	N/A	N/A
NOLA.com Home Page Super Billboard	 April May June	 78,750 78,748 68,228	N/A	 50 58 51	 .06% .07% .07%
NOLA.com Dedicated E-Blast	June 20 June 26	21,196 21,196	3,318 3,357	345 536	1.63% 2.53%
Biz New Orleans Biz Talks Podcast	April 11 April 18 April 25 May 1	N/A	105 79 128 93	N/A	N/A
Biz New Orleans ½ Page Print Ad	May 10	N/A	40,000	N/A	N/A
Biz New Orleans E-Blast & Re-Drop	May 9 May 22 May 31 June 22	17,000 40,000 40,000 40,000	N/A 8,717 8,688 6,487	N/A 898 991 900	N/A 2.25% 2.48% 2.25%

Biz New Orleans Morning Biz Newsletter	May 4-June 4	N/A	N/A	425	N/A
Biz New Orleans Afternoon Biz Newsletter	June 6	N/A	5,715	193	3.4%
	June 13		4,919	147	2.9%
	June 20		5,926	746	5.0%
	June 26		5,770	682	4.58%
	June 27		6,289	1,546	10.36%
	June 28		5,595	581	3.89%
	June 29		6,087	910	6.10%
	June 30		5,887	929	6.23%

Table 22.27: Digital Display and Digital Audio Ad Delivery by Zips

DIGITAL DISPLAY & DIGITAL AUDIO: GEOGRAPHIC DELIVERY				
ZIP CODE *	IMPRESSIONS	CLICKS	CTR	REACH
70114	46,589	165	0.35%	9,024
70119	30,305	76	0.25%	5,719
70117	24,596	79	0.32%	4,987
70115	18,040	52	0.29%	3,197
70113	17,109	33	0.19%	3,794
70112	15,111	69	0.46%	3,131
70130	7,809	19	0.24%	1,227
70116	6,092	12	0.20%	1,278
70125	3,737	8	0.21%	681

**Sample of the zip codes that showed the most impressions delivery via the digital display and digital audio ads.*

Table 22.28: Earned Media Results

PROGRAM PARTNER/MEDIA OUTLET	DATE	REACH	CLICKS
NOLA NewsWire	February 6	N/A	N/A
StayLocal Social	February 15	N/A	N/A
Downtown Development District FB Post	February 27	7,500	N/A
Biz New Orleans.com	February 27	5,645	N/A
Biz New Orleans FB Post	February 27	12,000	N/A
Entergy New Orleans FB and Twitter Post	March 10	N/A	N/A
Entergy New Orleans News Room Article – Café Reconcile Partners with Energy Smart to save more on their energy use	March 10	N/A	N/A
WWL Earth Day On-Air Interview	April 20	265,487	N/A
New Orleans Business Alliance Newsletter	June 9	6,803	153
	June 28	6,791	59

Small Business Online Marketplace Campaign Details

The small business online marketplace was supported throughout PY13 with eight campaigns promoting the energy-saving products available exclusively to small commercial customers. These campaigns launched during key retail promotional periods when the online store offered additional manufacturer discounts and were supported with paid social ads and email. The paid social ads received 307.5K total impressions, reached 118K people, received 5,899 total clicks and initiated 555 website checkouts.

Early Spring: Ran March 3-March 15, supported with social media and an email campaign. The promotion messaged deals on smart thermostats available on the Small Business Online Store. Sales metrics for March reported 639 new users to the online marketplace. Social media drove 60.6% of the traffic to the online store.

Earth Day: Ran April 14-April 23, supported with social media and an email campaign. The promotion featured smart thermostats, LED bulbs, power strips and free small business kits. Sales metrics for April reported 853 new users to the online marketplace. Social media drove 60% of the traffic to the online store.

Memorial Day: Ran May 16-May 29 supported with social media and an email campaign. The promotion messaged the clearance sale on LED bulbs – up to 80% off. Sales metrics for May reported 376 new users to the online marketplace. Social media drove 45.8% of the traffic to the online store.

July 4: Ran June 29-July 5 supported with social media and an email campaign. The promotion featured smart thermostats. Sales metrics for July reported 504 new users to the online marketplace. Social media drove 63.1% of the traffic to the online store.

Labor Day: Ran August 28-September 5 supported with social and an email campaign. The promotion featured smart thermostats. Sales metrics for September reported 380 new users to the online marketplace. Social media drove 29.9% of the traffic to the online store.

Energy Efficiency Month. Ran October 19-October 31 supported with social media and an email campaign. The promotion featured 25 pack T-LED linear LEDs, smart thermostats, water-aerator and power strip. Sales metrics for October reported 455 new users to the online marketplace. Social media drove 34.5% of the traffic to the online store.

Black Friday: Ran November 22-November 28 supported with social media and an email campaign. The promotion featured smart thermostats and the 25 pack T-LED linear LED's. Sales metrics for November reported 705 new users to the online marketplace. Social media drove 59.5% of the traffic to the online store.

Holiday: Ran December 13-December 27 supported with social media and an email campaign. The promotion featured the deep discounts on select smart thermostats. Sales metrics for December reported 1,003 new users to the online marketplace. Social media drove 68.6% of the traffic to the online store.

Table 22.29: Small Business OLM Campaign Results

CAMPAIGN/PROMO	CHANNEL	IN-MARKET DATE	IMPRESSIONS/ SENDS	REACH/ OPENS	OPEN RATE	CLICKS	CTR
Early Spring	Email	March 6	7,391	3,096	42.2%	138	1.9%
	Social	March 15	March 3-26,929	14,488	N/A	728	2.84%
Earth Day	Email	April 18	7,338	2,600	35.8%	73	1%
	Social	April 14-	40,489	16,628	N/A	719	1.8%
Memorial Day	Email	May 23	7,562	2,383	31.8%	71	.9%
	Social	May 16-	33,349 May 29	9,254	N/A	526	1.6%
July 4	Email	June 28	7,612	2,313	30.6%	76	1.0%
	Social	June 29-	46,297 July 5	14,228	N/A	586	1.26%
Labor Day	Email	August 29	10,503	4,071	43.2%	80	.8%
	Social	August 28-	29,184 September 5	16,192	N/A	838	2.87%
Energy Awareness Month	Email	October 30	9,846	3,850	39.3%	80	.8%
	Social	October 19-	31,531 October 31	4,350	N/A	269	.85%
Black Friday	Email	November 20	9,798	4,258	43.8%	86	.9%
	Social	November 22-	38,79 November 28	17,771	N/A.	839	2.16%
Holiday	Email	December 20	9,692	4,107	42.9%	83	.9%
	Social	December 13-	60,843 December 27	26,517	N/A	1,394	2.29%

Small Business Energy Assessment Campaign Details

The small business energy assessment (SBEA) campaign launched in August and ran through December supported with digital display, paid social, print, email, earned media, dedicated email campaigns with NOLA.com and a sponsored content buy with NOLA.com/Times-Picayune. The press release announcing the launch of the small business energy assessment offering was picked up by Biz New Orleans and WGNO. WGNO provided on-air coverage of this offering in addition to posting on their website. The NOLA.com paid media buys were the top source of traffic to the SBEA landing page with a total of 1,375 users visiting the page. After 4 months, the paid media ads generated 1.19M total impressions, reached 147.8K people and received 5,218 total clicks.

Table 22.30: Small Business Energy Assessment Email Campaign Results

IN-MARKET	IMPRESSIONS/SENDS	REACH/OPENS	OPEN RATE	CLICKS	CTR
August 31	11,397	4,951	49.3%	47	.55
September 19	10,456	4,570	48.7%	63	.7%
September 26	11,330	3,818	38.3%	44	.4%
October 9	11,304	4,696	47.3%	55	.6%
November 7	9,818	4,537	46.4%	55	.6%
November 28	9,761	4,287	44.3%	71	.7%
December 6	9,742	4,407	45.6%	47	.5%
December 18	9,707	4,291	44.7%	38	.4%

Table 22.31: Small Business Energy Assessment Paid Media Results

TACTIC	IN-MARKET DATE	IMPRESSIONS/ SENDS	AUDIENCE REACH/ OPENS	CLICKS/LEADS	CTR
Digital Display	Aug. 27-Dec. 15	191,087	59,760	318	.17%
Paid Social	Aug. 23-Nov. 30	78,438	21,046	2,624	3.35%
NOLA Chamber E-Blast Digital Ad	Dec.11	N/A	2,460	51	N/A
City Business Print Ad	Oct. 20	15,000	N/A	N/A	N/A
City Business Daily Alert Ads	Sept.11-Sept. 15	75,899		25	.03%
	Oct. 9-Oct. 13	75,483	N/A	44	.06%
	Oct. 16-Oct. 18	43,577		38	.09%
Times-Picayune Front Page Print Strip Ad	Oct 1 Oct 8 Nov 12 Dec 3	N/A	20,183	N/A	N/A
NOLA.com On-Site Display	Sept. 20-Dec. 13	237,348	N/A	434	.18%
NOLA.com Home Page Super Billboard	Sept. 20-Dec. 13	62,010	N/A	21	.03%
NOLA.com Dedicated E-Blast	Oct. 25	35,000	6,237	687	1.96%
	Nov. 1	6,227	921	128	2.06%
NOLA.com Facebook Post	Oct. 5	53,122	25,784	797	N/A
NOLA.copm Homepage Feature	Oct. 5	104,997	1,059	40	.04%
Print Article	Oct. 8	N/A	N/A	N/A	

NOLA.com In-Article Display Ad	Oct. 8-Nov.7	1,604	N/A	11	.69%
New Orleans Tribune ½ Page Print	Oct Nov Dec	70,000	N/A	6	N/A

Table 22.32: Small Business Energy Assessment Top Zip Codes by Impression Delivery and Clicks

ZIP	IMPRESSIONS	CLICKS	CTR	REACH
70118	4,754	16	.34%	802
70117	3,780	10	.26%	712
70122	5,601	13	.23%	959
70126	3,856	6	.16%	724
70131	3,767	6	.16%	717
70115	4,422	5	.11%	876
70114	4,196	4	.10%	703
70130	3,982	4	.10%	663
70119	5,159	3	.06%	1,053
70125	6,383	2	.03%	1,362

Table 22.33: Small Business Energy Assessment Earned Media Results

PROGRAM PARTNER/MEDIA OUTLET	DATE
Chamber of Commerce News Releases	August 7
Downtown Development District Newsletter	August 11
StayLocal	August 14
The New Orleans Agenda Newsletter	August 16
WGNO	August 16
Biz New Orleans	August 17
NOLA Newswire	August 18
The Office of Resiliency & Sustainability Summer Newsletter	August 30

Q3/Q4 Campaign Details

The Q3/Q4 incentive bonus campaign launched in July with an email blast. Paid media launched August and ran through November and was supported with a mix of digital display, paid social, print, dedicated email campaigns with City Business Journal, Biz New Orleans and NOLA.com/Times-Picayune. After three months in market, the paid ads generated 1.56M total impressions, reached 199,000 people and received 7,661 total clicks.

Table 22.34: Q3/Q4 Email Campaign Results

IN-MARKET	IMPRESSIONS/SENDS	REACH/OPENS	OPEN RATE	CLICKS	CTR
July 18	11,075	3,905	36%	67	.6%
July 27	339	129	40.2%	16	5.0%
August 14	580	186	38.6%	65	13.8%
August 31	953	276	36.1%	14	1.9%
September 19	1,712	426	32.2%	31	2.3%
September 26	1,188	314	34.7%	18	2.0%
November 7	1,142	590	52.1%	27	2.4%
November 27	1,574	541	37.2%	40	2.7%
December 18	1,566	527	36.5%	37	2.6%

Table 22.35: Q3/Q4 Paid Media Campaign Results

TACTIC	IN-MARKET DATE	IMPRESSIONS/ SENDS	AUDIENCE REACH/ OPENS	CLICKS/LEADS	CTR
Digital Display	Aug. 11-Sept. 10	110,949	37,005	198	.18%
Paid Social: Up to 100% Creative	Aug. 11-Nov. 26	43,662	10,498	916	2.48%
Paid Social: Up to $200K Creative	Aug. 11-Nov. 26	77,228	21,658	1,884	2.43%
City Business Print Ad	Sept. 22	15,000	N/A	N/A	N/A
City Business Daily Alert Ads	Aug. 23-Aug. 25	49,419	N/A	16	.03%
	Aug. 28-Sept. 1	81,158		53	.07%
	Sept. 4-Sept. 8	66,670		66	.10%
	Oct. 2-Oct. 6	75,802		39	.05%
City Business Custom E-Blast – Up to $200K creative	Oct. 3	21,509	5,101	99	1.94%
Projects covered up to 100% creative	Oct. 25	21,390	5,116	115	2.25%
Times-Picayune Front Page Print Strip Ad	Sept. 10 Sept. 24				

	Oct. 22 Oct. 29 Nov. 5	N/A	31,999	N/A	N/A
NOLA.com On-Site Display	Nov. 1-Nov. 17	135,102	N/A	57	.04%
NOLA.com Home Page Super Billboard	Sept. 8-Oct. 31	141,074	N/A	87	.06%
NOLA.com Off-Site Digital Display	Sept. 11-Nov. 17	305,211	N/A	166	.05%
NOLA.com Dedicated E-Blast	Sept. 28 Nov. 21	33,600 2,242	5,166 490	799 36	2.38% 1.61%
Biz Dedicated E-Blast and Re-Drop	Oct. 12 Oct. 24	40,000 40,000	7,654 5,512	994 877	N/A N/A
Biz New Orleans ½ page print	Oct. 10	40,000	N/A	2	N/A
Biz New Orleans Afternoon Biz Newsletters	Sept. 14 Sept. 20 Sept. 21 Oct. 3 Oct. 4 Oct. 10 Oct. 12 Oct. 17 Oct. 18 Oct. 24 Oct. 26 Nov. 7 Nov. 8 Nov. 9 Nov. 14	14,732 14,719 14,716 14,719 14,721 14,714 14,708 14,691 14,690 14,678 14,671 14,657 14,657 14,650 14,653	4,265 4,215 3,979 4,045 4,087 4,021 4,514 4,279 4,324 4,278 4,392 4,071 4,231 4,067 4,303	29 30 24 16 32 22 83 24 28 42 26 24 36 25 18	N/A

Table 22.36: Q3/Q4 Earned Media Results

PROGRAM PARTNER/MEDIA OUTLET	DATE
New Orleans Mayor Office Energy Efficiency Day Press Release	Oct 5
WWL – Newell Norman Radio Show	September 13

Table 22.37: Trade Ally Newsletters and Emails

EMAIL CONTENT	IN-MKT	IMPRESSIONS/SENDS	REACH/OPENS	OPEN RATE	CLICKS	CTR
Kick-Off Meeting Email	January 10	185	100	54.9%	14	7.7%
Kick-Off Meeting Reminder Email	January 16	184	118	64.1%	22	12%
25% Bonus Incentive Email	January 27	223	131	62.1%	35	16.6%
Q1 2023 TA Quarterly Newsletter	March 20	65	36	55.4%	36	7.7%
Q2 2023 TA Quarterly Newsletter	May 11	154	60	39.5%	2	1.3%
25% Bonus Extension	July 27	339	129	40.2%	16	5.0%
Energy Efficiency Panel Discussion	September 7	327	92	37.7%	10	4.1%
Q3 2023 TA Quarterly Newsletter	September 8	178	69	41.6%	2	1.2%
$500 TA Bonus to Registered TA's	October 17	162	90	61.2%	4	2.7%
$500 TA Bonus to Non-Registered TA's	October 20	358	128	42.7%	21	.7%
Trends in Electrification Webinar	December 16	596	260	44.4%	11	1.9%
2024 TA Kick-Off & Awards Meeting Invite	December 18	183	76	42.5%	8	4.5%

Marketing Collateral

- C&I Overview
  - English
  - Spanish
- Prescriptive Incentive List
- Small Business Energy Assessment Overview
- Loews Hotel Case Study
- Andrew H. Wilson Case Study
- University of New Orleans Case Study
- Trade Ally Recruitment collateral: Become an Energy Smart Trade Ally
- Energy Smart Program Overview
- Redesigned window cling and accompanying Thank You note.
- New Online Marketplace 'Thank You' insert.
- Small Business Energy Assessment web content
- Compressed Air web content
- Compressed Air Overview
- Warehouse Sector Overview
- New Construction Overview
- Offering social posts and newsletter content
- Meeting invite template.

- Program presentations.

Marketing Tactics:

- Print ads
- Digital display ads
- Traditional radio with 30 and :15 radio spots
- Digital audio
- Social posts – paid and organic
- Email campaigns – owned and dedicated eblasts through paid media buys
- Press Releases/on-air media interviews
- Paid sponsorships
    - Love Your City
    - Downtown Development District
- Out of home through Public Awareness Campaign business themed ads
- Earned media
    - NOLA Newswire
    - StayLocal
    - Downtown Development District
    - Biz New Orleans
    - Entergy New Orleans
        - Organic social
        - Customer featured article posted on Newsroom
    - WWL on-air interview for Earth Day
    - WGNO
        - On-air coverage of SBEA offering
        - SBEA offering posted on WGNO homepage.
    - WWL/Newell Normande radio interview – guest of Michael Hecht, GNO, Inc.
    - The New Orleans Agenda
    - The Mayor's Office Energy Efficiency Day press release
    - Office of Resiliency & Sustainability Summer Newsletter

Customer Outreach

In PY13 the Energy Smart commercial outreach team conducted customer outreach with 360 large and small commercial customers. Customers came from a segment mix of hotels, universities, city government, economic development organizations, industrial service providers, contractors/real estate developers, food and beverage and retail stores. The Energy Smart team also participated in three Life City Keep It Clean NOLA events in PY13. On April 6, Energy Smart was a panelist at the Impact Officer Roundtable. On May 25, Energy Smart was one of four panelist at the Life City 'Keep It Clean NOLA Campaign' Kick-Off and lastly on June 28, the Energy Smart team was one of three presenters at the "Keep It Clean NOLA" event at Café Negril.

Table 22.38: Customer Outreach

DATE	CUSTOMER
1/6/2023	Tulane University
1/10/2023	Trane
1/12/2023	National World War II Museum
1/18/2023	Lakeview Christian Center

1/20/2023	General Services Administration
1/24/2023	University of New Orleans
1/24/2023	Louisiana Cancer Research Center
1/25/2023	Hyatt Regency New Orleans
1/25/2023	Highgate Properties
1/26/2023	Westin Hotel
1/30/2023	New Orleans Business Alliance
1/30/2023	Nice Guys Nola
1/31/2023	NO Board of Trade Building
2/1/2023	City of New Orleans
2/1/2023	Canal Place
2/1/2023	Nice Guys
2/1/2023	Union Ramen
2/3/2023	General Services Administration
2/6/2023	New Orleans & Company
2/6/2023	SWBNO
2/6/2023	SWBNO
2/7/2023	Louisiana Children's Museum
2/8/2023	Jonquil Wise
2/13/2023	GNO, Inc.
2/15/2023	NORA
2/15/2023	City Park Conservancy
2/16/2023	Kevin Alker
2/16/2023	City Park Conservancy
2/22/2023	14 Parishes
2/22/2023	Hotel Chloe
2/23/2023	Hilton Riverside
2/28/2023	Port NOLA
3/1/2023	LSU-IAC
3/1/2023	Volunteers of America
3/7/2023	Holy Name of Jesus Church
3/8/2023	Holy Name of Jesus Church
3/10/2023	Kevin Alker
3/15/2023	City of NO Property Mgmt Summit Meeting
3/16/2023	Kirk Williams
3/16/2023	Chester Development
3/17/2023	GSA - Ameresco
3/17/2023	National World War II Museum
3/21/2023	Hotel Chloe
3/22/2023	Kevin Alker
3/22/2023	Mercantile Hotel
3/22/2023	Hotel Monteleone
3/22/2023	St Vincent Hotel

3/22/2023	Wyndham La Belle Maison
3/22/2023	Sazerac House
3/22/2023	Roosevelt Hotel
3/23/2023	Touro Infirmary
3/24/2023	Isidore Newman School
3/24/2023	NOMMA,
3/24/2023	Sazerac House
3/24/2023	NOAC
3/24/2023	Cambria Hotel
3/27/2023	SWBNO
3/29/2023	M3 Design
3/29/2023	Kupperman Companies
3/29/2023	Hotel Chloe
3/30/2023	Marriott EBC
3/31/2023	General Services Administration
4/3/2023	Daniel Rich - PEC
4/3/2023	St Bernard Nursing and Rehab
4/3/2023	Kupperman Companies meeting
4/5/2023	LSUHSC
4/5/2023	Hotel Chloe
4/5/2023	St Bernard Nursing and Rehab
4/6/2023	Life City
4/6/2023	Abramson Sci Academy
4/6/2023	Nice Guys Nola
4/10/2023	GNO, Inc.
4/10/2023	Wisznia Architechts
4/13/2023	Second Line Stages
4/17/2023	Riley Foods
4/17/2023	JW Marriott
4/18/2023	Creole Cuisine Concepts
4/20/2023	Goodwill Industries
4/20/2023	Saenger Theater
4/24/2023	2701 Lawrence Street
4/25/2023	Textron
4/26/2023	Textron
4/26/2023	The Ritz Carlton
4/27/2023	Bernhard Capital Partners
5/2/2023	Kupperman
5/2/2023	Saenger Theater
5/8/2023	St.Bernard Nursing and Rehab
5/8/2023	Capital City Lighting
5/8/2023	Le Petit Theater
5/8/2023	Saenger Theater
5/8/2023	Harriet Tubman Montessori

5/8/2023	Mahalia Jackson Theater
5/8/2023	Ace Hotel
5/9/2023	Algiers Economic Development Foundation
5/9/2023	Harriet Tubman School
5/11/2023	Coliseum
5/12/2023	General Services Administration
5/16/2023	New Orleans & Co
5/16/2023	J. Landry-Harriet Tubman
5/17/2023	Rusty Nail
5/18/2023	Avenue Plaza Hotel
5/18/2023	St Bernard nursing
5/23/2023	Capital City Lighting
5/23/2023	RayGen Services
5/24/2023	Harriet Tubman Montessori
5/25/2023	Ruby Slipper
5/25/2023	EMR Group
5/25/2023	Brennan group
5/30/2023	Hampton Inn Convention Center
5/30/2023	Harriet Tubman
5/30/2023	Nice Guys Nola
5/31/2023	NBG LLC
5/31/2023	Liberty Bank
6/5/2023	St.Bernard Nursing and Rehab
6/6/2023	Ferrand ACS
6/7/2023	Creole Cuisine Concepts
6/7/2023	St. Bernard Nursing and Rehab
6/8/2023	K&B Plaza
6/12/2023	St. Bernard Nursing and Rehab
6/13/2023	Creole Cuisine Concepts
6/13/2023	Hotel Chloe
6/16/2023	Creole Cuisine Concepts
6/20/2023	EMR Group
6/21/2023	St Bernard Nursing and Rehab
6/22/2023	Automated Controls
6/23/2023	CNO Procurement Fair
6/26/2023	Ruby Slipper
6/28/2023	Joshua Blount
6/29/2023	House of Blues
6/29/2023	Dickie Brennans Steakhouse
6/29/2023	St. Bernard Nursing and Rehab with Automated Controls
7/5/2023	Reilly Foods
7/5/2023	Addis NOLA
7/6/2023	Total Community Action
7/6/2023	Fastest Labs
7/7/2023	GSA - Ameresco

7/7/2023	Creole Cuisine Concepts
7/10/2023	Riverwalk Mall
7/12/2023	EMR Group
7/17/2023	Damin's Menswear
7/17/2023	Creole Cuisine Concepts
7/19/2023	Classy Hair By Julie
7/19/2023	Creole Cuisine Concepts
7/19/2023	Riverwalk Mall
7/20/2023	NOCCA
7/21/2023	Tito's Ceviche & Pisco
7/21/2023	Prexus
7/21/2023	Ingersoll Rand
7/24/2023	Beurman Miller Fitzgerald
7/24/2023	Super Discount
7/24/2023	Palace Café
7/25/2023	Fixated Hair
7/25/2023	Homestead Title
7/25/2023	Loews Hotel
7/26/2023	KTS Insurance Agency
7/26/2023	Case IZ
7/26/2023	Palace Cafe
7/27/2023	Ochsner walkthrough
7/31/2023	AP Energy
8/2/2023	Reilly Foods
8/7/2023	Link NOLA
8/7/2023	Artecch
8/7/2023	New Orleans Adult Learning Center
8/8/2023	NOCCA
8/9/2023	Eat-Well Food Mart
8/9/2023	Matassa Market
8/9/2023	Porgy's
8/9/2023	Saint Charles Ave. Baptist Church
8/12/2023	Bourbon Vieux
8/14/2023	True Love Missionary Baptist Church
8/14/2023	Royal Castle Child Development
8/14/2023	Bourbon Vieux
8/14/2023	NOCCA
8/14/2023	Creole Cuisine Concepts
8/15/2023	Doerr Furniture & Warehouse
8/16/2023	Cuddly Bear Child Development Center
8/16/2023	Honey Baked Ham
8/17/2023	South Shore Donuts & Grill
8/17/2023	Tout De Suite
8/17/2023	Bell & McCoy
8/18/2023	GSA - Ameresco

8/21/2023	Graphite Galleries
8/21/2023	K&B Plaza
8/21/2023	Russell Bertucci
8/22/2023	Royal Sonesta
8/23/2023	EMR Group
8/23/2023	Folgers
8/24/2023	Set Wrap and Go Beauty Salon
8/24/2023	Aunt Sally's
8/24/2023	University Holy Cross
8/25/2023	Elysian Events LLC
8/28/2023	Pomelo's
8/28/2023	Bell & McCoy
8/28/2023	WYES
8/29/2023	Nostalgia
8/29/2023	Manifested Miracles Properties
8/29/2023	Miracles Event Hall
8/29/2023	NASA
8/30/2023	Entergy CSM Meeting
8/30/2023	Labmar Ferry
8/31/2023	Simply Fit
8/31/2023	Folgers
9/1/2023	Arabella Rental Investments LLC
9/1/2023	GSA - Ameresco
9/5/2023	David Band
9/5/2023	Tulane Memorial Baptist Church
9/6/2023	Bywater Brew Pub
9/6/2023	Ibrahim's Autoplex
9/6/2023	New Orleans Cold Storage
9/7/2023	NOLA Premier Injury Center
9/7/2023	Imani Dance Academy
9/7/2023	Federal Reserve Bank
9/11/2023	Urban South
9/11/2023	Creole Cuisine Concepts
9/12/2023	Standard Lines Brokerage
9/12/2023	St. George's Episcopal
9/13/2023	St. Bernard Project
9/14/2023	Union Gallery
9/14/2023	Gallery X
9/14/2023	NOLABA
9/14/2023	Bernhard
9/14/2023	LCTCS Event with NASA @ Delgado River City
9/14/2023	Lowes
9/14/2023	Riverwalk Mall
9/15/2023	WYES
9/15/2023	Loews Hotel

9/15/2023	Entergy CSM
9/15/2023	K&B Plaza
9/18/2023	Station 432 Holding LLC
9/18/2023	Dillard University
9/18/2023	K&B Plaza
9/19/2023	Jackson Barracks
9/19/2023	NO & Co.
9/20/2023	Mainstreet Event Hall
9/20/2023	Gilda's Childcare
9/20/2023	Reilly Foods
9/20/2023	K&B Plaza
9/20/2023	Creole Cuisine Concepts
9/21/2023	Dream House Lounge
9/22/2023	Craig Tracy Gallery
9/22/2023	Algiers Charter Schools
9/22/2023	Firstline Schools
9/22/2023	NOCCA
9/25/2023	Wakin Bakin
9/25/2023	New Orleans School of Glassworks
9/26/2023	Universal Printing
9/26/2023	NOCCA
9/26/2023	Nola LED
9/27/2023	Liberty Bank
9/27/2023	OPSB
9/27/2023	NOLA Public School
9/27/2023	Algiers Charter Schools
9/28/2023	Marriott
9/28/2023	WYES
9/29/2023	GSA - Ameresco
10/2/2023	Saint Bernard Baptist Church
10/2/2023	Trane Commercial
10/2/2023	Isidore Newman
10/2/2023	WYES
10/2/2023	Trane Commercial
10/3/2023	Algiers Charter Schools - LB Landry
10/3/2023	Algiers Charter Schools
10/4/2023	Audubon Institute
10/5/2023	Energy Smart Panel Discussion
10/5/2023	Fairgrounds
10/9/2023	South Property Investments LLC
10/9/2023	NOLA LED
10/9/2023	Sheraton Hotel
10/10/2023	Mattress By Appointment
10/10/2023	Hyatt Hotel
10/10/2023	Entergy CSM Amy Baham

10/10/2023	Entergy CSM Walter Maples
10/11/2023	St. Roch Market
10/11/2023	City Park Physical Therapy
10/11/2023	Folgers
10/12/2023	Law Office of Jacqueline Mae Goldberg
10/12/2023	Mid-City Animal House
10/12/2023	Creole Cuisine Concepts
10/12/2023	Fairgrounds
10/13/2023	Anytime Fitness
10/13/2023	GSA - Ameresco
10/16/2023	NOCCA Foundation
10/16/2023	NOCCA
10/16/2023	Fairgrounds
10/16/2023	Entergy CSM Tomekia
10/17/2023	Elite Air Systems
10/17/2023	LB Landry
10/18/2023	Gemini Chiropractic and Rehab
10/19/2023	Undergrowth Coffee
10/19/2023	WWL TV
10/20/2023	1st Lady Novelties
10/20/2023	K&B Plaza
10/23/2023	Saint Peter Apartments
10/23/2023	Foundation Prep
10/23/2023	WWL TV
10/24/2023	Homedale Inn Bar
10/24/2023	Hyatt Regency
10/24/2023	Entergy CSM Amy Baham
10/25/2023	Orleans Brothers LLC
10/25/2023	Beaucoup Media
10/25/2023	Johnson Controls
10/25/2023	Xavier University
10/27/2023	Family Resources of New Orleans
10/27/2023	Xrunn LLC
10/30/2023	Link Restaurant Group
10/31/2023	The Mumphrey Group
10/31/2023	Irish Channel Christian Fellowship
11/1/2023	Economic Development
11/1/2023	NASA
11/1/2023	Riverwalk Mall
11/2/2023	NOLA LED
11/3/2023	Melba's Tulane
11/6/2023	Unique Place
11/7/2023	Theo's Pizza
11/8/2023	Louie's Kitchen
11/8/2023	Neo Fabrics & Supply Co.

11/8/2023	Stuart Hall School For Boys
11/8/2023	Creole Cuisine Concepts
11/8/2023	CANO
11/8/2023	La Belle Maison
11/9/2023	New Orleans Healing Center
11/9/2023	NASA
11/13/2023	Proper Attention Hair Studio
11/13/2023	NOLA LED
11/14/2023	NOCCA Foundation
11/15/2023	Totally Fit Physique
11/15/2023	E Kraemer LLC
11/15/2023	Sheraton New Orleans
11/16/2023	Grace Pilates + Yoga
11/16/2023	Broadway Mission Baptist Church
11/20/2023	CANO
11/27/2023	Healthy NOLA
11/27/2023	Hertz Property Management
11/29/2023	NOLA LED
11/30/2023	Good Catch
12/1/2023	Foundation Prep
12/4/2023	Revolution Realty
12/4/2023	Prytania Properties
12/5/2023	Natal's A/C and Electrical
12/6/2023	Economic Development
12/7/2023	Who Dat Wings
12/7/2023	Alonse` Salon
12/7/2023	Sara Beauty Supply
12/8/2023	Holy Trinity Greek Orthodox Cathedral
12/8/2023	Cornerstone United Methodist Church
12/8/2023	GSA - Ameresco
12/11/2023	Perla Orihuela
12/12/2023	Sports Zone
12/12/2023	Black & Gold Wash & Fold
12/18/2023	Central Home Health
12/18/2023	Trinity Episcopal
12/19/2023	New Orleans African American Museum
12/19/2023	Crescent Office
12/19/2023	NOLA Public Schools
12/19/2023	Parish Energy
12/20/2023	K&B Plaza
12/21/2023	Who Dat Wings
12/21/2023	Exclusive Nola Boutique
12/21/2023	UNO
12/21/2023	Marriott

Planned/Proposed Changes

Several changes are planned for PY14. Resources will be allocated to update the Energy Smart website to simplify and enhance the customer journey experience. Customer testimonial videos will be produced for the website in addition to edutainment animated video on the small business energy assessment offering. The Energy Smart team will discontinue marketing support for the small business online marketplace and shift those dollars to support the small business energy assessment offering. Media strategy in PY14 will include paid search to drive small business assessments and project submissions; site-retargeting ads to business customers to improve conversion rates and retain customers with cross promotional ads; pre-roll digital ads utilizing the small business energy assessment animated videos; streaming TV and paid media sponsorships with Biz New Orleans and NOLA.com that will include sponsored content articles; print ads, dedicated eblasts, digital ads in e-newsletters and high impact digital banner ads on their homepages.

Trade Allies

Overview

The overall mission of the Trade Ally Network is to develop and increase the local residential, commercial, and industrial contractor base by facilitating training and marketing engagement opportunities, aiding with program participation and providing support with obtaining supplier diversity certifications.

Engaging the registered Trade Ally Network is a key factor in the success of the Energy Smart program as trade allies bring in a substantial portion of program savings.

Table 23.1: C&I Trade Ally Tiers

TIER	# OF TRADE ALLIES
Platinum	90
Gold	3
Silver	6
General	24

Commercial & Industrial Trade Ally Network

In Q1 the Energy Smart team updated the Commercial & Industrial trade ally tier system based on trade ally participation in the prior program year. The designations of Platinum, Gold, Silver or General correspond to benefits such as the option to co-brand marketing materials. Trade allies learned their status at the Trade Ally kickoff meeting. Energy Smart also hosted one online training, focused on utility bills.

In Q2 the Energy Smart team hosted multiple online trainings as well as an in-depth sales training. The online trainings centered on understanding power factor's role in efficiency and comprehending updates to the state's building code. The sales training was conducted in-person by a nationally renowned instructor.

In Q3 the Energy Smart team introduced the small business energy assessment. Conducted by program staff, these assessments will provide leads for trade allies focusing on assisting small businesses. The team also hosted the Retro-commissioning training administered by Harris Energy Solutions.

In Q4 the Energy Smart team announced the trade ally bonus and hosted the Energy Efficiency Panel Discussion.

Residential Trade Ally Network

The Residential Trade Ally Network held the Trade Ally Kick-Off and Awards on January 17, which served as the Q1 TAAG meeting.

- Review of PY13
- Overview of budget and goals PY14
- Summary of technical training opportunities throughout the year.
- Workforce guest speakers from the city of New Orleans and from New Orleans Career Center.
- Best practices for rebate technology and referrals.
- Referral management.

- Quality initiatives and equipment calibration

Energy Smart provided the following awards to trade allies:

- Lighting Trade Ally of the Year
- Building Automation Trade Ally of the Year
- Retro-commissioning Trade Ally of the Year
- Small Business Trade Ally of the Year
- Customer Service Trade Ally of the Year

On June 14 the team hosted the Mid-Year Residential Trade Ally Advisory Group meeting. Program staff covered:

- The program status of goals and budget.
- Review of Trade Ally assignments in the Navigator tool and training.
- Review of best practices focused on calibration of equipment.
- Invitation to Advanced Weatherization Techniques Training.

On October 11 the team hosted the Q4 Trade Ally Advisory Group meeting. Program staff covered:

- The project pipeline and program status of goals and budget.
- Review of Trade ally assignments in the Navigator tool and training.
- Introduction of the Trade Ally referral addition to the self scheduling tool that allows trade allies to schedule their own customers.
- Invitation to the Trade Ally portal.

Commercial & Industrial Trade Ally Advisory Group

Energy Smart hosted the Commercial & Industrial Trade Ally Kick-Off and Awards Ceremony. Program staff reviewed the following topics:

- Review of PY12
- Overview of budget and goals PY13
- Program Year 13 Bonus for projects submitted by June 30 and installed by September 30.
- Directions on how to fill out the updated Excel workbook applications.
- Summary of program outreach efforts to small and large commercial customers.
- Reminders of lighting requirements related to DLC and Energy Star.
- Updated PY13 trade ally tier rankings and the benefits associated with the tiers.
- Summary of technical training opportunities throughout the year.
- The opportunity to record audio/video descriptions of trade ally job descriptions which would be promoted within the workforce network.

Energy Smart provided the following awards to trade allies:

- Lighting Trade Ally of the Year
- Building Automation Trade Ally of the Year

- Retro-commissioning Trade Ally of the Year
- Small Business Trade Ally of the Year
- Customer Service Trade Ally of the Year

On June 13 the team hosted the Mid-Year C&I Trade Ally Advisory Group meeting. Program staff covered:

- The project pipeline and program status of goals and budget.
- The leaderboard of trade ally participation to that point in the year.
- Adjustments to offerings such as compressed air and continuous commissioning.
- Workforce development and training opportunities.
- Reminders about the project submission process.
- Emphasis on Q1 &Q2 bonus.

On October 10 the team hosted the Q4 Trade Ally Advisory Group meeting. Program staff covered:

- The project pipeline and program status of goals and budget.
- The leaderboard of trade ally participation to that point in the year.
- The trade ally bonus and its requirements.
- Workforce development and training opportunities.
- The city of New Orleans Climate Action Plan and building performance standards.

Contractor Engagement

Engagement is defined as contractors who have applied and been approved to become Registered Residential Trade Ally and/or Registered Commercial & Industrial trade ally. Contractors who register with both are counted in both totals.

Table 23.2: Contractor Engagement

CATEGORY	# OF TRADE ALLIES
C&I Network	90
Residential Network	14
Total Engagement	**104**

Contractor Participation

Participation is defined as registered trade allies who have completed and closed out projects in the current program year.

Table 23.3: Contractor Participation

CATEGORY	# OF COMPANIES
C&I Network	24
Residential Network	14
Total Engagement	**38**

Planned or Proposed Changes

Energy Smart has proposed the following changes for Program Year 14:

- Increase lead distribution through the small business assessment offering.
- Partner with LSU Sales Institute to lead sales training and provide trade allies connections to potential applicants.
- Facilitate an Energy and Water Conservation Summit consisting of panelists and expert speakers, focusing on facility directors and sustainability coordinators.
- Work with the Association of Energy Engineers (AEE) to create a local AEE chapter.
- Present a webinar to trade allies on the topic of lightbulb recycling.
- Partner with Harris Energy Solutions to lead a training on retro-commissioning.

The program plans to build upon its efforts in workforce development. Energy Smart staff will:

- Continue as an official member of the LA Green Corps Employee Advisory Council.
- Collaborate with Delgado Community College on the creation of a building automation certification.
- Introduce trade allies directly to local workforce development partners such as the New Orleans Career Center.
- Facilitate one-on-one conversations between trade allies and workforce groups who can supply applicants.

Program Training

Audiences Trained

Energy Smart provided technical training to:

- Commercial & industrial trade allies
- Residential trade allies
- Facility directors
- Architecture firms
- Commercial business owners
- Workforce agency staff and students
- Program staff

Training Topics

Energy Smart provided onboarding training to 31 new Commercial & Industrial trade allies in Program Year 13. The onboarding of individual Commercial & Industrial trade allies consisted of the following overview of the application process:

- Instructions on using the incentive application.
- An overview of the items required for project submission, such as a utility bill and a verification the equipment meets industry specifications.
- A review of the custom and prescriptive measure incentive rates.
- Training on communicating effectively about all Energy Smart offerings, including services which the individual trade allies do not offer themselves.

On March 22 Energy Smart welcomed energy engineer Adil Khan, senior member of the Association of Energy Engineers, to lead the training 'Unlocking the Mystery of Utility Bills' on the following topics:

- Line items that determine overall utility bill price
- Demand charge, energy charge and reactive power charge
- Purchased power cost
- Base rate charges
- Riders
- Franchise fees
- Active power and apparent power
- Power quality and power factor

On April 11 Energy Smart welcomed David Bonaventure, PE, CEM, to lead a discussion with trade allies about updates to the state Building Energy Code. Bonaventure was the past president of the Baton Rouge Chapter of ASHRAE. The training covered how the state's Energy Code would impact:

- New insulation levels
- Building envelope construction
- HVAC equipment efficiencies
- Building ventilation changes
- Energy recovery
- Lighting controls
- Mechanical and electrical commissioning

On April 26 Energy Smart provided the webinar “Power Factor: Back to the Basics” which included:

- Understanding Power Factor
- How non-linear loads or equipment affect the Power Factor in buildings.
- How Power Factor impacts watts per square feet in a building.
- How Power Factor affects power quality.
- How improving the Power Factor of electrical panels and equipment can improve overall building Power Factor.
- How energy inefficiencies in commercial buildings increase total power demand and consumption.

On July 19 Energy Smart partnered with Harris Energy Solutions to offer a retro-commissioning training, specifically focusing on measurement and verification. The following topics were addressed:

- Tasks involved in the processes of retro-commissioning and measurement and verification.
- Equipment needed to collect measurements of building systems.
- How to apply measurement and verification procedures to real-life scenarios.
- How to leverage incentives and rebates to maximize the financial savings.

The presentation provided a comprehensive overview of the Retro-Commissioning (RCx) process, spanning through different key phases. The introductory section delves into the definition of RCx, highlighting its associated benefits and goals, and outlines the potential performers of RCx. Moving into the RCx Planning Phase, the focus is on confirming the site and project scope, initiating a kick-off meeting, identifying current facility requirements, and finalizing the RCx plan. The subsequent RCx Investigation Phase involves activities such as an initial site visit, equipment data collection, evaluation of building control systems, obtaining utility information for baseline performance, and the creation and execution of a performance testing plan. This phase also includes the identification of Retro-Commissioning Measures (RCMs) and the generation of a comprehensive RCx report, detailing findings, recommendations, and economic analysis, along with insights from lessons learned.

The RCx Implementation Phase discusses strategies for implementing recommendations, considering options like in-house or contractors, providing assistance during implementation, and ensuring the verification of completion and closure of the Issues Log. Training support, if needed, is also covered in this phase. Following implementation, the RCx Verification Phase focuses on the development and execution of a Measurement & Verification Plan, along with exploring various International Performance Measurement and Verification Protocol (IPMVP) options for different RCMs.

Additionally, the presentation included a practical field visit to the Mechanical Equipment Room, providing a hands-on perspective. Throughout the entire process, the importance of learning from experiences and continuous improvement is highlighted through the integration of "Lessons Learned" at each stage of the RCx journey.

On December 12 Energy Smart partnered with Harris Energy Solutions to present a panel discussion on electrification. Moderator Jess Harris welcomed panelists Deng Lin of Harris Energy Solutions, Saverio Gross of Opt-in Consultants, Amanda Cambre of Western Washington University and Adam Webb of Entergy eTech to discuss:

- An overview of electrification's significance for Louisiana's climate goals
- Heat pump technology
- Incentives for electric equipment
- Industry trends in electrification

24.1: Training by Investment by Audience Type

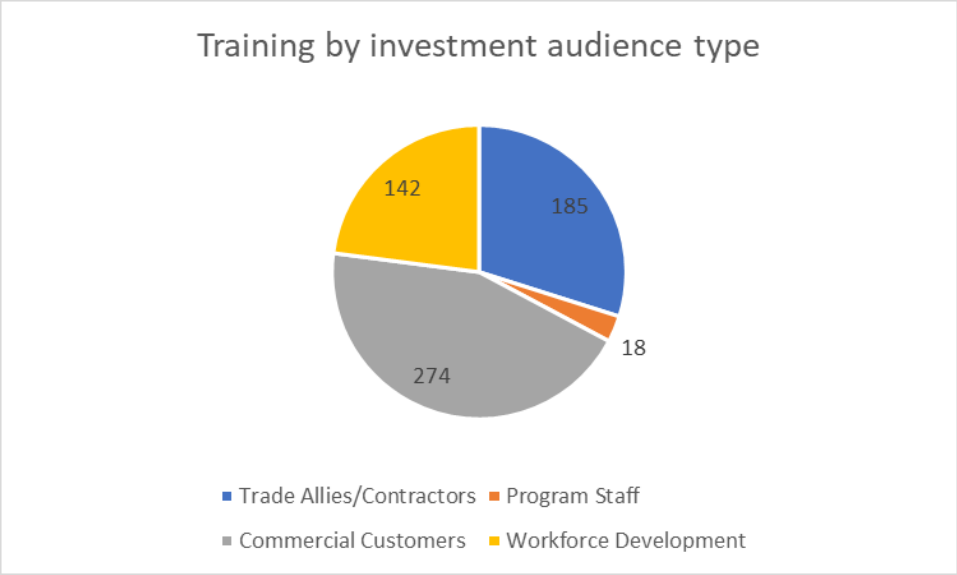
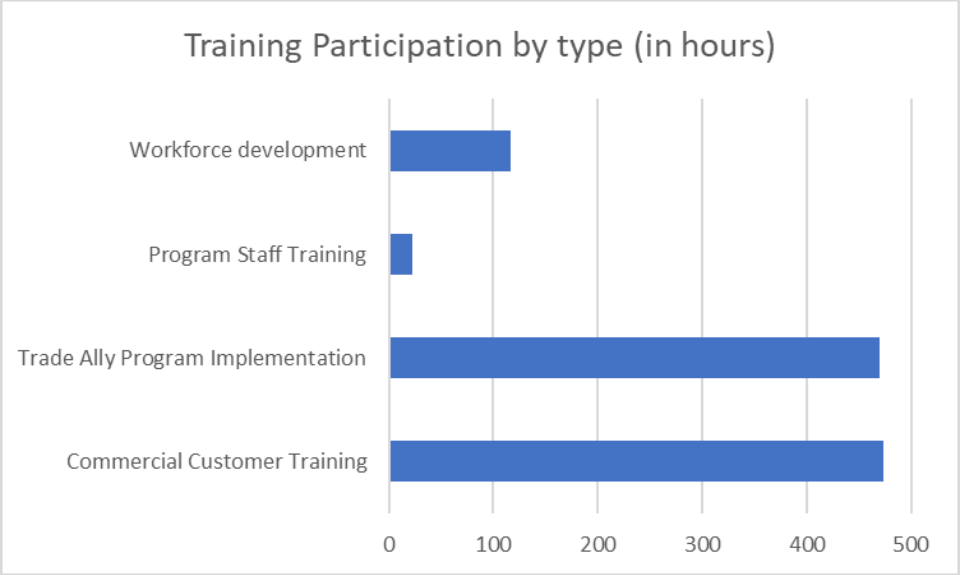


Chart 24.2: Training by Participation Type



Market Segmentation Training Highlights

Program staff focused its training evenly on commercial customers and trade allies. Customer training consisted of program overviews to a wide variety of stakeholders: church pastors, restaurant owners, health providers, facility directors, and corporate executives. Whereas larger commercial properties were typically familiar with the program in advance, the smaller businesses typically discovered the program's benefits through direct outreach that program staff conducted. Customers reviewed the steps to submit a project and receive incentives, as well as how to connect with trade allies. Trade ally training consisted of individual meetings with trade allies to review specific or potential projects, quarterly advisory group meetings and technical training.

Training Objective

The objective of commercial trade ally training is to review the steps for customers to submit projects to the program, understand the timeline for incentives and to assist commercial customers in securing products and services from trade allies. The objective of trade ally training is to ensure that trade allies are confident in their ability to communicate accurately and effectively about the program and to submit projects efficiently with the appropriate documentation.

Initiatives

Supplier Diversity & Inclusion

Energy Smart partners with multiple small, diverse and local businesses to help deliver the program. These partners create a dynamic and diverse program delivery model. Energy Smart invests in the development of these businesses, providing them with necessary experience to thrive and grow in the energy efficiency sector. These small, minority, and/or disadvantaged businesses that supported Energy Smart are meaningful contributors to the program design and delivery. Their scopes are developed to increase their skills and capabilities in the energy efficiency field. In total, Energy Smart spent over $2.4 million of non-incentive program funds on diverse suppliers in 2023.

Workforce Development

A key component of Energy Smart's delivery model is to continuously improve and elevate trade ally skills and capabilities through training and workforce development initiatives. Energy Smart's core training and workforce development partner is the Urban League of Louisiana (ULLA), a national organization with significant experience with workforce development and training initiatives.

The ULLA serves an integral role in the New Orleans community as an advocate, a service provider and a trusted source of information for communities of color and underserved populations on a variety of topics. As such, the ULLA plays a pivotal role in engaging these communities on behalf of Energy Smart, reaching minority contractors to prepare them to provide energy efficiency services for clients and to prepare them for green industry opportunities in the region. Additionally, ULLA's Contractor Resource Center provides support and training to local contractors who may not have previous experience performing energy efficiency upgrades or who haven't worked with a utility incentive program in the past.

In addition to the partnership with the ULLA, Energy Smart team coordinates with other local workforce development agencies, including:

- Delgado Community College
- Nunez Community College
- New Orleans Career Resource Center
- New Orleans Business Alliance
- Louisiana Green Corps
- Vietnamese Initiatives in Economic Training
- LA Workforce Commission

In Program Year 13 Energy Smart worked with trade allies on several workforce objectives:

- Energy Smart staff facilitated connections between workforce organizations and the trade allies who were open to consider internships and entry-level employees.
- Energy Smart exhibited at the Junior Achievement Career Expo on March 7. This festival showcased tech jobs, training opportunities, and business ventures to high school students.
- Energy Smart met with several members of the LA Workforce Commission and employment agency within the City of New Orleans on July 6.
- Energy Smart represented trade ally career paths at the New Orleans Apprenticeship Administrators and Directors meeting on August 31.
- Energy Smart met in September with career counselors at all universities in New Orleans about career paths in energy efficiency.
- Energy Smart met with the workforce and innovation team of Greater New Orleans, Inc., regarding career paths in commercial energy efficiency.
- Energy Smart hosted a Clean Energy Career Fair on September 27 at Tulane Memorial Baptist Church.
- Energy Smart staff represented commercial trade allies at a Green Jobs Meetup on October 12, providing overviews of career paths within the Trade Ally Network.
- Energy Smart presented on October 26 at the U.S. Green Building Council Forward Conference about careers in clean energy.

FINANCIAL PERFORMANCE

Incentive Budget Highlights

Table 26.1

OFFERING	INCENTIVES	BUDGET*	% TO BUDGET
Small Commercial & Industrial Solutions	$292,395	$711,293	41%
Large Commercial & Industrial Solutions	$2,346,572	$4,037,813	58%
Publicly Funded Institutions	$307,720	$1,486,165	21%
Commercial & Industrial Construction Solutions	$31,856	$132,300	24%
Large C&I Automated Demand Response	$208,581	$418,200	50%
Home Performance with ENERGY STAR	$1,446,570	$1,929,175	75%
Retail Lighting & Appliances	$634,564	$1,143,327	56%
Multifamily Solutions	$717,113	$677,241	106%
Income Qualified Weatherization	$1,971,880	$1,850,412	107%
A/C Solutions	$568,439	$999,341	57%
Appliance Recycling & Replacement Pilot	$85,100	$221,737	38%
School Kits & Community Outreach	$94,000	$98,600	95%
Behavioral Energy Efficiency	$0	$0	N/A
EasyCool BYOT	$230,725	$355,000	65%
Peak Time Rebate Pilot	$12,880	$48,275	27%
EV Charging Pilot	$3,458	$29,100	12%
Residential Battery Pilot	$9,350	$18,500	51%
TOTAL	**$8,961,205**	**$14,156,479**	**63%**

**Budgets are reflective of the Energy Smart Implementation Plan PY13-PY15.*

Summary table shows energy efficiency incentive spend from January 1, 2023 through December 31, 2023.

Table 26.2

ENERGY SMART EXPENSES/INVOICES						FUNDING SOURCES	
YEAR	Month	Program Year 12	Program Year 13	Program Year 14	Total	EECR	Total Ending Balance
2023	January	$1,857,381			$1,857,381	$1,413,564	($6,667,203)
2023	February	$68,094			$68,094	$1,208,735	($7,807,845)
2023	March		$1,920,487		$1,920,487	$1,244,079	($7,131,437)
2023	April	$674,911	$1,908,053		$2,582,964	$1,217,807	($5,766,280)
2023	May	$380,298	$1,250,753		$1,631,051	$1,314,890	($5,450,120)
2023	June	$17,718	$2,326,116		$2,343,834	$1,587,406	($4,693,692)
2023	July		$1,116,883		$1,116,883	$1,828,572	($5,405,381)
2023	August	$44,537	$2,094,277		$2,138,814	$1,968,707	($5,235,274)
2023	September	$13,444	$1,287,566		$1,301,010	$1,960,402	($5,894,666)
2023	October		$743,321		$743,321	$1,514,872	($6,666,218)
2023	November		$3,012,958		$3,012,958	$1,225,348	($4,878,607)
2023	December		$913,967		$913,967	$1,210,571	($5,175,212)
2024	January		$536,958	$1,144,211	$1,681,169	$1,651,416	($5,145,458)
2024	February		$203,174		$203,174	$1,519,089	($6,461,374)
2024	March		$228,619	$1,237,419	$228,619	$1,351,106	($7,583,861)
2024	April		$592,346	$2,347,813	$2,940,158	$1,341,982	($5,985,685)
2024	May		$482,429	$369,357	$851,786	$1,592,513	($6,726,412)
2024	June		$57,342		$57,342		

Net Savings Summary

Entergy's Third-Party Evaluator, ADM Associates, conducted the program evaluation to verify the gross energy savings of each offering. Additionally, ADM estimated program net-to-gross ratios (NTGRs) through evaluation of free-ridership and spillover effects.

The Energy Smart program achieved 57,640,926 in Net kWh savings and 17,915 in Net kW reductions. These values represent savings net-of-free-ridership, compared to the filed goals.

Table 26.3

	NET kWh SAVINGS**	kWh GOAL*	% TO SAVINGS GOAL	NET kW REDUCTIONS**	kW TARGET*	% TO kW TARGET
Small Commercial & Industrial Solutions	2,400,157	4,925,994	49%	296.19	949	31%
Large Commercial & Industrial Solutions	20,050,863	35,008,874	57%	3,243.29	6,475	50%
Publicly Funded Institutions	2,671,103	10,799,767	25%	305.35	409	75%
Commercial & Industrial Construction Solutions	141,407	3,512,971	4%	31.23	806	4%
Large C&I Automated Demand Response	72,445	N/A	N/A	3,019.95	6,970	43%
Home Performance with ENERGY STAR	10,106,743	16,461,506	61%	809.52	883	92%
Retail Lighting & Appliances	4,929,492	7,997,811	62%	735.80	1,110	66%
Multifamily Solutions	2,519,333	2,678,475	94%	650.65	142	458%
Income-Qualified Weatherization	4,355,709	3,817,679	114%	1,986.43	108	1,839%
A/C Solutions	3,155,116	2,848,496	111%	1,334.21	1,239	108%
Appliance Recycling & Replacement	59,289	1,701,810	3%	7.39	25	30%
School Kits & Community Outreach	712,976	797,088	89%	89.86	N/A	N/A
Behavioral Energy Efficiency	6,466,294	14,067,914	46%	1,091.12	N/A	N/A
EasyCool BYOT	-	N/A	N/A	3,984.08	9,600	42%
Peak Time Rebate Pilot	-	N/A	N/A	200.46	714	28%
EV Charging Pilot	-	N/A	N/A	49.42	525	9%
Residential Battery Pilot	-	N/A	N/A	80.27	135	59%
Total	**57,640,926**	**104,618,385**	**55%**	**17,915.22**	**30,090**	**60%**

** Goals are reflective of the Energy Smart Implementation Plan PY13-15.*

***Savings reflect verified net energy savings as documented in TPE's Evaluation, Measurement and Verification (EM&V) report.*

The Energy Smart program achieved a Net-to-Gross Ratio (NTGR) of 84% in Net kWh savings relative to the verified gross kWh savings and a kW NTGR of 95%.

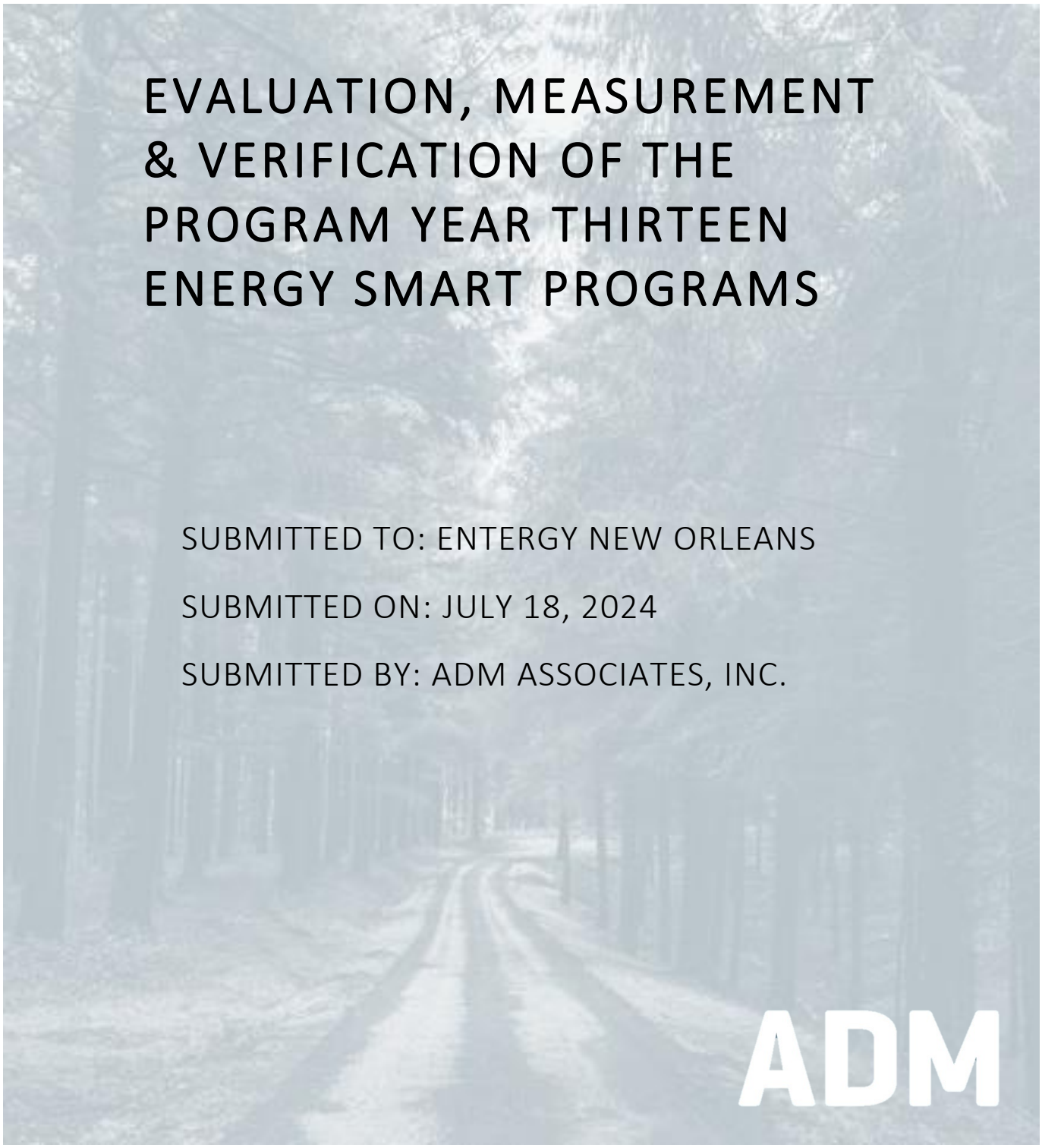
Table 26.4

	VERIFIED GROSS KWH	NET KWH SAVINGS*	KWH NTGR	VERIFIED GROSS KW	NET KW REDUCTION*	KW NTGR
Small Commercial & Industrial Solutions	2,400,157	2,400,157	100%	296.19	296.19	100%
Large Commercial & Industrial Solutions	20,886,316	20,050,863	96%	3,378.43	3,243.29	96%
Publicly Funded Institutions	2,935,278	2,671,103	91%	335.55	305.35	91%
Commercial & Industrial Construction Solutions	261,865	141,407	54%	57.84	31.23	54%
Large C&I Automated Demand Response	72,445	72,445	100%	3,019.95	3,019.95	100%
Home Performance with ENERGY STAR	16,643,910	10,106,743	61%	1,014.48	809.52	80%
Retail Lighting & Appliances	6,926,676	4,929,492	71%	1,057.33	735.80	70%
Multifamily Solutions	2,971,658	2,519,333	85%	769.32	650.65	85%
Income-Qualified Weatherization	4,355,709	4,355,709	100%	1,986.43	1,986.43	100%
A/C Solutions	3,538,524	3,155,116	89%	1,498.68	1,334.21	89%
Appliance Recycling & Replacement Pilot	113,457	59,289	52%	14.10	7.39	52%
School Kits & Community Outreach	712,976	712,976	100%	89.86	89.86	100%
Behavioral Energy Efficiency	6,466,294	6,466,294	100%	1,091.12	1091.12	100%
EasyCool BYOT	-	-	N/A	3,984.08	3,984.08	100%
Peak Time Rebate Pilot	-	-	N/A	200.46	200.46	100%
EV Charging Pilot	-	-	N/A	49.42	49.42	100%
Residential Battery Pilot	-	-	N/A	80.27	80.27	100%
Total	**68,285,264**	**57,640,926**	**84%**	**18,923.50**	**17,915.22**	**95%**

**Net savings as documented in TPE's Evaluation, Measurement and Verification (EM&V) report.*

Appendices

Appendix A: School Kits & Education Summary
Appendix B: Community Outreach Summary
Appendix C: Training and Education
Appendix D: Marketing Assets



EVALUATION, MEASUREMENT & VERIFICATION OF THE PROGRAM YEAR THIRTEEN ENERGY SMART PROGRAMS

SUBMITTED TO: ENTERGY NEW ORLEANS

SUBMITTED ON: JULY 18, 2024

SUBMITTED BY: ADM ASSOCIATES, INC.

ADM Associates, Inc.
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ACRONYMS/ABBREVIATIONS

TABLE 1 ACRONYMS/ABBREVIATIONS

Acronym	Term
AC	Air Conditioner
AOH	Annual operating hours
APS	Advanced Power Strip
AR&R	Appliance Recycling & Replacement
BP	Behavioral Program
BYOT	Bring Your Own Thermostat
C&I	Commercial and Industrial
CEE	Consortium for Energy Efficiency
CF	Coincidence factor
CFL	Compact fluorescent lamp (bulb)
CFM	Cubic feet per minute
CRE	Commercial Real Estate
DI	Direct install
DLC	Direct Load Control
DLC	Design Lights Consortium
EER	Energy efficiency ratio
EFLH	Equivalent full-load hours
EISA	Energy Independence and Security Act
EL	Efficiency loss
EM&V	Evaluation, Measurement, and Verification
ES	ENERGY STAR®
EUL	Estimated Useful Life
GPM	Gallons per minute
HDD	Heating degree days
HID	High intensity discharge
HOU	Hours of Use
HP	Heat pump
HPwES	Home Performance with ENERGY STAR
HSPF	Heating seasonal performance factor
HVAC	Heating, Ventilation, and Air Conditioning
IEER	Integrated Energy Efficiency Ratio
IEF	Interactive Effects Factor
IPLV	Integrated part load value
IQW	Income Qualified Weatherization
ISR	In-Service Rate
kW	Kilowatt

Acronym	Term
kWh	Kilowatt-hour
LCA	Lifecycle Cost Adjustment
LED	Light Emitting Diode
M&V	Measurement and Verification
MFS	Multifamily Solutions
MW	Megawatt
MWh	Megawatt-hour
NC	New Construction
NTG	Net-to-Gross
PCT	Participant Cost Test
PFI	Publicly Funded Institutions
PY	Program Year
QA	Quality Assurance
QC	Quality Control
RCA	Refrigerant charge adjustment
RIM	Ratepayer Impact Measure
RLA	Retail Lighting and Appliances
ROB	Replace on Burnout
RR	Realization Rate
RUL	Remaining Useful Life
SEER	Seasonal Energy Efficiency Ratio
SK&E	School Kits and Education
TA	Trade Ally
TRC	Total Resource Cost Test
TRM	Technical Reference Manual
UCT	Utility Cost Test
VFD	Variable Frequency Drive

SAVINGS TYPES

TABLE 2 SAVINGS TYPES

Savings Types	Definition
Energy Savings (kWh)	The change in energy (kWh) consumption that results directly from program-related actions taken by participants in a program.
Demand Reductions (kW)	The time rate of energy flow. Demand usually refers to electric power measured in kW (equals kWh/h) but can also refer to natural gas, usually as Btu/hr., kBtu/hr., therms/day, etc.
Expected / *Ex Ante* Gross	The change in energy consumption and/or peak demand that results directly from program-related actions taken by participants in a program, regardless of why they participated.
Verified / *Ex Post* Gross	Latin for "from something done afterward" gross savings. The energy and peak demand savings estimates reported by the evaluators after the gross impact evaluation and associated M&V efforts have been completed.
Net / *Ex Post* Net	Verified / *Ex Post* gross savings multiplied by the net-to-gross (NTG) ratio. Changes in energy use that are attributable to a particular program. These changes may implicitly or explicitly include the effects of free-ridership, spillover, and induced market effects.
Annual Savings	Energy and demand savings expressed on an annual basis, or the amount of energy and/or peak demand a measure or program can be expected to save over the course of a typical year. The TRM provides algorithms and assumptions to calculate annual savings and are based on the sum of the annual savings estimates of installed measures or behavior change.
Lifetime Savings	Energy savings expressed in terms of the total expected savings over the useful life of the measure. Typically calculated by multiplying the annual savings of a measure by its EUL. The TRC Test uses savings from the full lifetime of a measure to calculate the cost-effectiveness of programs.

1 EXECUTIVE SUMMARY

1.1 Overview

This report provides a summary of the evaluation effort of the 2023 ("Program Year 13" or "PY13") Energy Efficiency (EE) and Demand Response (DR) portfolio by Entergy New Orleans (ENO). The Energy Smart Programs are administered between January 01, 2023, and December 31, 2023. The evaluation was led by ADM Associates Inc. (herein known as "ADM", or "the Evaluators").

1.2 Evaluation Objectives

The following activities were performed through the PY13 EM&V effort:

- Verify program tracking data and correctly apply the New Orleans Technical Reference Manual Version 6.1 (NO TRM V6.1) to calculate savings and estimate PY13 gross and net energy and demand impacts at the high impact measure, program, and portfolio levels.
- Adjust program-reported gross savings using the results of evaluation research, relying primarily on tracking system and engineering desk reviews, metered data analysis, on-site verification, and equipment metering and achieve a minimum precision of ±10% of the gross realized savings estimate with 90% confidence;
- In consultation with the Advisors, estimate net-to-gross (NTG) ratio values, which was performed following the NO TRM V6.1 and provide complete documentation and transparency of all evaluated savings estimates, and where relevant, compare with TRM calculations, as recommended;
- Provide ongoing technical reviews and guidance to implementers and ENO throughout the evaluation cycle and review tracking system data to assess data captured for new measure offerings following TRM protocols;
- Conduct EM&V research to support possible updates for the next version of the TRM, which may include information on commercial and residential envelope measures, business type lighting hours of use, and persistence of behavioral savings; and
- Complete a full process evaluation of the energy efficiency programs, but no process evaluation of the demand and behavioral programs in PY13.

1.3 Energy Smart Portfolio Overview

In PY13, the ENO Energy Smart portfolio included the following programs. The table below shows each programs' sector, type and who implemented the program for ENO.

TABLE 1-1 PY13 ENERGY SMART PORTFOLIO OF PROGRAMS

Program Name	Found in the Report As	Sector	Type	Third-Party Implementor
Home Performance with ENERGY STAR®	HPwES	Res	EE	Franklin
Income Qualified Weatherization	IQW	Res	EE	Franklin
Multifamily Solutions	MF Solutions	Res	EE	Franklin
A/C Solutions	A/C Solutions	Res	EE	Franklin
Retail Lighting and Appliances	RLA	Res	EE	Franklin
School Kits and Education	SK&E	Res	EE	National Theatre for Children
Appliance Recycling & Replacement	AR&R	Res	EE	Legacy Professional Services
Behavioral	Behavioral	Res	EE	Franklin
EasyCool Bring Your Own Thermostat	BYOT	Res	DR	Energyhub
Peak Time Rebate	PTR	Res	DR	Bidgely
Battery Energy Storage System Pilot	BESS	Res	DR	Honeywell
Electric Vehicle Charging Pilot	EV Charging	Res	DR	Sagewell
Small C&I Solutions	Small C&I	C&I	EE	APTIM
Large C&I Solutions	Large C&I	C&I	EE	APTIM
Publicly Funded Institutions	PFI	C&I	EE	APTIM
C&I Construction Solutions	C&I NC	C&I	EE	APTIM
Large C&I Automated Demand Response	Large C&I DR	C&I	DR	Honeywell

In PY13, ENO offered a portfolio of 17 programs; five demand responses (DR) and 12 energy efficiency programs which provided a comprehensive range of customer options focused on energy efficiency, demand reduction, and educational options.

ENO designed its programs to achieve the following objectives:

- PY13 *ex post* gross energy savings (kWh) goal of 104,618,385 kWh and a demand reduction (kW) target of 17,944 kW;[1]
- Significant energy-savings opportunities for all customers and market segments; and
- Broad ratepayer benefits.

The Evaluators calculated the results for PY13 for each C&I and residential program. Those programs are described below.[2]

- **Home Performance with ENERGY STAR® (HPwES):** This offering will achieve long-term, significantly cost-effective electric savings using local auditors and trade allies who will help residential customers analyze their energy use and identify opportunities to improve efficiency, install low-cost energy-saving measures, and identify and implement more comprehensive home efficiency projects.

[1] These goals represent first-year energy and demand savings at the meter.

[2] The program descriptions below align with the ENO Application for Approval of the Implementation Plan for PY13 through PY14 of the Energy Smart Program. Filed July 29, 2022, in Docket Nos. UD-20-02 and UD-08-02.

HPwES will offer three levels of home energy audits. The Assessment will include a "walk-through" inspection and direct installation of low-cost measures, such as LEDs and water conservation measures. To generate additional savings at the time of the audit, demand response enabled smart thermostats to have been added as a direct install measure.

- **Retail Lighting and Appliances (RLA):** The objective of this offering is to increase the awareness and sales of efficient lighting and appliances to ENO's residential population. The offering will provide customers with the opportunity to purchase a variety of discounted products that are ENERGY STAR qualified or better. The two main program activities include (1) retailer recruitment and merchandizing and 2) administration of the incentive process (including program tracking).
- **Multifamily Solutions (MF Solutions):** This offering targets multifamily property owners (landlords) and managers, as well as apartment and condo renters. The offering will address these customers' unique needs through a combination of incentives for both direct install and prescriptive measures, and through property owner and tenant education.
- **Income Qualified Weatherization (IQW):** This offering is designed to offer qualifying customers free energy efficiency projects ranging from direct install measures, such as LED bulbs and water savings measures, to demand response enabled smart thermostats and comprehensive envelope measures.
- **A/C Solutions:** This offering will provide residential customers with a more comprehensive set of options to lower the energy consumption and cost associated with keeping their homes cool and comfortable in the summer. Customers with functioning ACs can improve the efficiency of their units with the help of a comprehensive AC tune-up or replacement. The offering will also include DR-enabled smart thermostats. The program will build capacity within the territory's HVAC trade ally network to provide value-added services to its customers.
  These services are eligible to be incentivized because they go above and beyond the standard industry practices and offerings in the marketplace.
- **School Kits and Education (SK&E):** This offering will continue to target middle school students in the New Orleans area. The program will work with local schools to enhance energy efficiency lessons and provide students with energy efficiency kits that they will install in their homes. The School Kit & Education offering will continue to provide the students with kits containing energy efficient items and the students will be able to use these items in their homes and track their energy savings.
- **Appliance Recycling and Replacement (AR&R):** This offering encourages early recycling of low efficiency appliances, such as refrigerators and freezers, for residential customers. The will also offer a refrigerator replacement option for income-qualified residential customers. This new offering will go beyond federal recycling requirements using environmentally friendly best practices for recycling all components of each appliance.
- **Behavioral:** Residential customers will receive a monthly Home Utility Report that compares them to similar and efficient households, shows their usage over time, provides tips for saving energy, and directs them to other program offerings.
- **EasyCool – Bring Your Own thermostat (BYOT):** This offering, in which residential customers purchase and install qualifying connected thermostats from device manufacturers on their own, voluntarily enroll those devices in the offering.

This offering will leverage EnergyHub's Mercury Distributed Energy Resource Management System ("DERMS"), which enables enrollment, monitoring, and load control of connected devices from the leading thermostat manufacturers and connected-home security providers.

- **Peak Time Rebate Pilot (PTR):** This offering provides incentives to residential customers for reducing their energy usage during short periods of high electricity usage. The offer was made available on a limited basis to the first customers to sign up during the Pilot phase.
- **Battery Energy Storage System Pilot (BESS):** This offering allowed customers to earn an incentive for enrollment and by participating in peak demand events. During these events, Entergy New Orleans, LLC (ENO) accessed stored energy from a home battery system to help provide more reliable power to the grid. The program allowed customers the ability to opt out without penalties. Participation was free with an eligible battery system. The program was limited to the first 30 customers who enrolled and met system qualifications. Customers qualified if they had a compatible solar photovoltaic system-connected BESS.
- **Electric Vehicle Charging Pilot (EV Charging):** This demand response pilot seeks to shift EV charging load to off-peak hours using a predetermined charging schedule. Sagewell uses software to identify potential EV chargers and invites them to participate in the program. Customers receive a monthly incentive for participating in the program. To qualify, customers must charge their car during off-peak hours at least three times a month and cannot override the charging schedule more than four times a month.
- **Small C&I Solutions:** This offering will provide small businesses (100 kW demand or less) and other qualified non-residential customers with the opportunity to achieve electricity savings through strategies designed specifically for this sector. This offering will help small business customers analyze facility energy use and identify energy efficiency improvement projects.
- **Large C&I Solutions:** The primary objective of this offering is to provide solutions for larger (greater than 100 kW demand) non-residential customers interested in energy efficiency through a prescriptive or custom approach. The Large C&I offering is designed to generate significant energy savings, as well as a longer-term market penetration by nurturing delivery channels, such as design professionals, distributors, trade allies, and Energy Service Companies (ESCOs).
- **Publicly Funded Institutions (PFI):** This offering is targeted at local publicly funded institutions. The offering will assist end use customers in overcoming barriers that are specific to publicly funded groups. Through hands-on expertise and consulting, the program benchmarks the institution's energy use and identifies a roadmap to success. Customers will be given guidance throughout their engagement with the program.
- **C&I Construction Solutions (C&I NC):** This offering will encourage customers to design and construct higher efficiency facilities than required by building codes or planned designs. This offering will be available to ground-up construction, additions, or expansions, building repurposing and commercial building restorations. The new construction offering will provide incentives for design assistance, prescriptive measures, and custom upgrades tailored to the customer's building operations.

- **Large C&I Demand Response (Large C&I DR):** This offering will be implemented by Honeywell. The objective of the program is to secure curtailable capacity from large C&I facilities. Honeywell, in coordination with ENO, will recruit, enroll, conduct DR Surveys, and install control equipment at customer sites to provide a turn-key solution for ENO Commercial customers. Specific load control shed measures are tailored to the individual customer facility and their operations.

Through its portfolio, ENO also seeks to provide customers with easy program entry points, flexible options for saving energy and ongoing support for those who want to pursue deeper energy savings (kWh) or demand reduction (kW). The table below shows a list of the programs with their PY13 e*x post* gross goal.

TABLE 1-2 ENERGY SAVINGS (KWH) GOALS AND DEMAND REDUCTION (KW) TARGETS BY PROGRAM

Program	*Ex Post* Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh) Goal	% of kWh Goal	*Ex Post* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW) Target	% of kW Target
HPwES	16,643,910	16,461,506	101%	1,014.48	NA	NA
RLA	6,926,676	7,997,811	87%	1,057.33	NA	NA
MF Solutions	2,971,658	2,678,475	111%	769.32	NA	NA
IQW	4,355,709	3,817,679	114%	1,986.43	NA	NA
A/C Solutions	3,538,524	2,848,496	124%	1,498.68	NA	NA
SK&E	712,976	797,088	89%	89.86	NA	NA
AR&R	113,457	1,701,810	7%	14.10	NA	NA
Behavioral	6,466,294	14,067,914	46%	1,091.12	NA	NA
EasyCool (BYOT)	0	NA	NA	3,984.08	9,600.00	42%
Peak Time Rebate Pilot	0	NA	NA	200.46	714.00	28%
BESS Pilot	0	NA	NA	0.00	135.00	0%
Small C&I Solutions	2,400,157	4,925,994	49%	296.19	NA	NA
Large C&I Solutions	20,886,316	35,008,874	60%	3,378.43	NA	NA
PFI	2,935,278	10,799,767	27%	335.55	NA	NA
C&I NC Solutions	261,865	3,512,971	7%	57.84	NA	NA
Large C&I Automated DR	72,445	NA	NA	3,019.95	6,970.00	43%
EV Charging Pilot (BYOC)	0	NA	NA	0.00	525.00	0%
Total	**68,285,264**	**104,618,385**	**65%**	**18,793.81**	**17,944.00**	**105%**

Sums may differ due to rounding.

1.4 Sections of the Report

This report is structured as shown below:

- Section 1 Executive Summary;
- Section 2 Evaluation Findings;
- Section 3 Evaluation Methodology;
- Section 4 Home Performance with ENERGY STAR Program;
- Section 5 Income-Qualified Weatherization Program;
- Section 6 Retail Lighting and Appliances Program;
- Section 7 Multifamily Solutions Program;
- Section 8 A/C Solutions Program;
- Section 9 School Kits and Education Program;
- Section 10 Appliance Recycling & Replacement Program;
- Section 11 Behavioral Program;
- Section 12 EasyCool - Bring Your Own Thermostat Program;
- Section 13 EasyCool for Business Program;
- Section 14 Large Commercial & Industrial Demand Response Program;
- Section 15 Small Commercial & Industrial Solutions Program;
- Section 16 Large Commercial and Industrial Solutions Program;
- Section 17 Commercial & Industrial Construction Solutions Program;
- Section 18 Publicly Funded Institutions Program;
- Appendix A – Commercial Site Reports;
- Appendix B – Cost-Effectiveness Evaluation; and
- Appendix C – Behavioral Program Model Output.

2 EVALUATION FINDINGS

The following subsections provide a summary of the portfolio-level findings and any cross-cutting evaluation activities that occurred over the course of the PY13 EM&V effort. Specifically, this includes:

- A summary of EM&V activities and expenditures;
- A summary of program and portfolio performance; and
- High-level findings that cut across programs.

2.1 Summary of Evaluation Effort

The table below summarizes the total EM&V expenditures and total program expenditures.

TABLE 2-1 PORTFOLIO EM&V EXPENDITURES

Total PY13 EM&V Expenditures	Total PY13 Program Expenditures	EM&V as % of Expenditures
$981,824	$18,678,943	5%

Sums may differ due to rounding.

To facilitate a thorough evaluation, the Evaluators conducted several primary research and data collection activities, including site visits, interviews with program and implementer staff, customer surveys, and market actor interviews. The Evaluators conducted participant surveys for programs using the collected self-reported data to inform net impacts for those programs. The results of these analyses informed our calculation of NTG values.

The Evaluators followed the NO TRM V6.1 in designing both the focus and level of effort for each process evaluation. For all programs, the Evaluators performed telephone discussions with the primary program staff and the primary implementation staff for most programs.

2.1.1 SUMMARY OF DATA COLLECTION

The tables below provide an overview of site visits and surveys in PY13.

TABLE 2-2 SURVEY AND INTERVIEW DATA COLLECTION OVERVIEW

Program	Type of Survey	Mode	Number of Times Contacted	Population Targeted	Completed Surveys	Response Rate	Precision
HPwES	Participant	Email	3	1,764	100	5.7%	8%
IQW	Participant	Email	3	1,665	72	4.3%	10%
RLA	Participant	Email	3	550	30	5.5%	15%
MF Solutions	Property Manager	Phone	3	11	2	18.2%	53%
A/C Solutions	NA	NA	NA	NA	NA	NA	NA
SK&E	NA	NA	NA	NA	NA	NA	NA
AR&R	NA	NA	NA	NA	NA	NA	NA
Behavioral	NA	NA	NA	NA	NA	NA	NA
EasyCool BYOT	Participant	Email	3	5,141	511	9.9%	4%
PTR Pilot	NA	NA	NA	NA	NA	NA	NA
BESS Pilot	NA	NA	NA	NA	NA	NA	NA
Small C&I Solutions	Participant	Email/Phone	3	77	1	1.3%	36%
Large C&I Solutions	Participant	Email/Phone	3	35	2	5.7%	36%
PFI	Participant	Email/Phone	3	7	1	14.3%	36%
C&I NC Solutions	Participant	Email/Phone	3	4	1	25.0%	36%

TABLE 2-3 SITE VISIT DATA COLLECTION OVERVIEW

Program	Sample Design Quota	Recruitment Mode	Number of Times Contacted	Total Population	Population Targeted	Scheduled Site Visits	Response Rate	Number of Site Visits Completed	Precision
HPwES	68	Phone	1	2,477	622	27	13%	26	16%
IQW	68	Phone	1	1,524	1,177	44	11%	34	14%
MF Solutions	25	Phone	3	2,055	985	0	0%	16	20%
A/C Solutions	25	Phone	1	1,257	533	0	13%	3	47%
Small C&I Solutions	27	Phone	1	94	27	7	10%	7	36%
Large C&I Solutions	40	Phone	1	121	40	3	10%	3	36%
PFI	10	Phone	1	19	10	2	9%	2	36%
C&I NC Solutions	4	Phone	1	5	4	2	10%	2	36%
Total	**267**			**3,398**	**3,398**	**85**		**93**	**0**

TABLE 2-4 SUMMARY OF PROCESS DATA COLLECTION

Stratification Approach	Respondent Group	Data Collection	Frame Source	Mode	Sample Size	Timing
HPwES	Participant	Program influence / NTG, home characteristics, experience, demographic data	Program Tracking Data	Web Survey	Census (goal: 68)	Oct-Dec 2023
IQW	Participant			Web Survey	Census (goal: 68)	Oct-Dec 2023
MF Solutions	Participant			Phone Survey	Census	Jan-Feb 2024
Retail Lighting	Participant			Web Survey	Census (goal: 68)	Oct-Dec 2023
EasyCool BYOT	Participant			Web Survey	Census (goal: 68)	Jan-Feb 2024
Small C&I Solutions	Participant	Program influence / NTG, business characteristics, experience, firmographic data	Program Tracking Data	Web/Phone Survey	Census	Jan-Feb 2024
Large C&I Solutions	Participant			Web/Phone Survey	Census	Jan-Feb 2024
PFI	Participant			Web/Phone Survey	Census	Jan-Feb 2024
C&I NC Solutions	Participant			Web/Phone Survey	Census	Jan-Feb 2024

PY13 also included a non-participant survey and two focus groups with residential and commercial trade allies.

2.1.1.1 Impact Data Collection

The Evaluators collected and verified project data through residential site visits in PY13. Site visits were scheduled via telephone outreach efforts, reaching out to customers and property managers that participated in residential programs.

In PY13, a total of 79 residential site visits were completed to verify project measures. Among the site visits completed, 26 were for the HPwES program, 34 were for IQW program, 16 were for MF Solutions program, and three (3) were for the AC Solutions program. In addition to these site visits, the Evaluators completed three (3) ride-along assessments to accompany the third-party implementer (TPI) that administered the AR&R program. The ride-along served to gather insights into the AR&R program.

The primary goal of these site visits was to verify the installation and accuracy of information collected on the application, with an emphasis on achieving 90% confidence and 10% precision. A random sampling process, with a focus on high-impact measures (HIM), determined the selected sites. The Evaluators executed the residential site visits between November 2023 and January 2024.

This denotes twelve property managers that managed apartment complexes accounting for 985 participants.

For the MF Solutions program, the Evaluators attempted to contact four (4) different property managers via telephone and via email communication, however, only two (2) responded to our outreach efforts. Ultimately, due to scheduling conflicts, only one of the property managers was available to accommodate a week's worth of site visits. In total, the Evaluators completed 16 site visits within one apartment complex in late January 2024.

Overall, the residential site visits achieved a precision of ± 9.0%.

More details about commercial site visits can be found in Section 3.4.1. The commercial site visits achieved a precision of ± 36.1%.

2.1.1.2 Process Data Collection

The Evaluators completed surveys with customers and active trade allies as part of the PY13 evaluation to collect information for use in verifying participation, assessing net savings, assessing the customer experience and satisfaction with programs, and levels of program awareness.

Evaluators performed 18 staff and implementer interviews with two program staff and nine implementer staff. Staff interviews with program staff provided insight into program management and operations.

The Evaluator also collected program-related information onsite. Site visits are intended to detail measure installation practices, customer experience, trade ally processes, and condition details. Where site visits cannot be performed, in-depth desk reviews can provide similar details without going onsite. Site visits were not impacted by the pandemic in PY13. These activities collect process and gross impact information.

To supplement findings from site visits, the Evaluators will also perform participant surveys. In some cases, such as with large commercial participants, surveys are replaced with phone interviews. In the case of multifamily participants, instead of surveying tenants, property manager interviews were performed. These activities collect process, net and gross impact information.

The table below shows the number of surveys, interviews, site visits and desk reviews performed.

TABLE 2-5 SUMMARY OF IMPACT PRIMARY DATA COLLECTION

PY13 Programs	Project Desk Reviews	Site Visits	# Participant Surveys	# Staff Interviews	# Property Manager Interviews	# Trade Ally Interviews
HPwES	Census	27	100	4	x	X
RLA		NA	30	4	x	x
MF Solutions		16	2	4	1	3
IQW		34	72	4	x	x
A/C Solutions		3	0	4	x	2
SK&E		NA	0	4	x	x
AR&R		TA Ride-along	0	4	x	x
Behavioral	Census	NA	0	4	x	x
EasyCool BYOT	Census	NA	511	4	x	x
PTR	Census	NA	0	4	x	x
BESS	Census	NA	0	4	x	x
EV Pilot	Census	NA	0	3	x	x
C&I NC	1		1	4	x	2
Small C&I Solutions	72		1	4	x	6
Large C&I Solutions	20		2	4	x	8
PFI	8		1	4	x	2
Large C&I DR	Census	NA	0	4	x	x

The table below outlines the scale of staff interviews in PY13.

TABLE 2-6 SUMMARY OF STAFF INTERVIEWS

Programs	Organization	Interviewed Staff Roles	# Staff Interviewed
HPwES	ENO, APTIM, & Franklin,	ENO Energy Efficiency Project Manager, ENO DSM Manager, APTIM Program Director, Franklin Program Manager	4
RLA			
MF Solutions			
IQW			
A/C Solutions			
SK&E	ENO, APTIM, & NCT	ENO Energy Efficiency Project Manager, ENO DSM Manager, APTIM Program Director, National Children's Theater	4
AR&R	ENO, APTIM, & Legacy Professional Services	ENO Energy Efficiency Project Manager, ENO DSM Manager, APTIM Program Director, Legacy Professional Services Principal	5
EasyCool BYOT	ENO, APTIM, EnergyHub	ENO EE Project Manager, ENO DSM Manager, EnergyHub Associate Director, APTIM Program Director	4
PTR	ENO & APTIM	ENO EE Project Manager, ENO DSM Manager, APTIM Program Director	3
BESS	ENO & Honeywell	ENO EE Project Manager, ENO DSM Manager, Honeywell District Manager, Honeywell Outreach Manager	4
EV Pilot	ENO & Sagewell	ENO EE Project Manager, ENO DSM Manager, Sagewell Project Manager	3

C&I NC	ENO & APTIM	ENO EE Project Manager, ENO DSM Manager, APTIM Program Director, APTIM Commercial Program Manager,	4
Small C&I Solutions			
Large C&I Solutions			
PFI			
Large C&I DR	ENO & Honeywell	ENO EE Project Manager, ENO DSM Manager, Honeywell Program Manager, Honeywell Energy Products Manager	4

The table below outlines survey timing and results. Additionally, information on incentives provided to survey participants. Effective contact information was limited in many cases.

TABLE 2-7 RESPONSE RATE INFORMATION

Program	Mode	Time Frame	Unique Contacts	# Complete	Incentive Paid ($)
HPwES	Email	Sep-Oct '23	1764	100	$2,500
IQW	Email	Sep-Oct '23	1665	72	$1,800
RL	Email	Sep-Oct '23	550	30	$750
MF Solutions	Phone	Sep-Oct '23	11	2	$50
EasyCool BYOT	Email	Sep-Oct '23	5141	511	5,110
Small C&I Solutions	Email/Phone	Sep-Oct '23	77	1	$25
Large C&I Solutions	Email/Phone	Sep-Oct '23	35	2	$50
PFI	Email/Phone	Sep-Oct '23	7	1	$25
C&I NC Solutions	Email/Phone	Sep-Oct '23	4	1	$25

2.1.2 IMPACT EVALUATION FINDINGS

The Energy Smart portfolio achieved 65% of planned *ex post* gross energy (kWh) savings and 105% of planned *ex post* gross demand reduction (kW). In addition to verifying the savings reported by ENO, the Evaluators calculated lifetime impacts. As part of this process, in the body of the report we refer to the impacts (energy savings (kWh) or peak demand reduction (kW)) accrued during the program year being evaluated (PY13) as "first year" impacts.

The tables below show the ENO goals, first year *ex ante* gross energy savings (kWh) (75,666,436 kWh) and *ex ante* gross demand reductions (18,360.08 kW), gross realization rates (90% for kWh, 63% for kW), net impacts (57,640,926 kWh and 10,581.04 kW), net-to-gross (NTG) ratios, and *ex post* gross (606,507,345 kWh) and *ex post* net (555,967,222 kWh) lifetime impacts.[3] The levelized cost of energy savings (kWh) for the PY13 portfolio is $0.0483 ($/kWh).

The figure below summarizes energy savings for each program in the portfolio.

[3] Lifetime impacts are the sum of energy savings over the course of the measure's effective useful life (EUL) and the weighted average demand reduction across the lifetime of the measure divided by the EUL (in years).

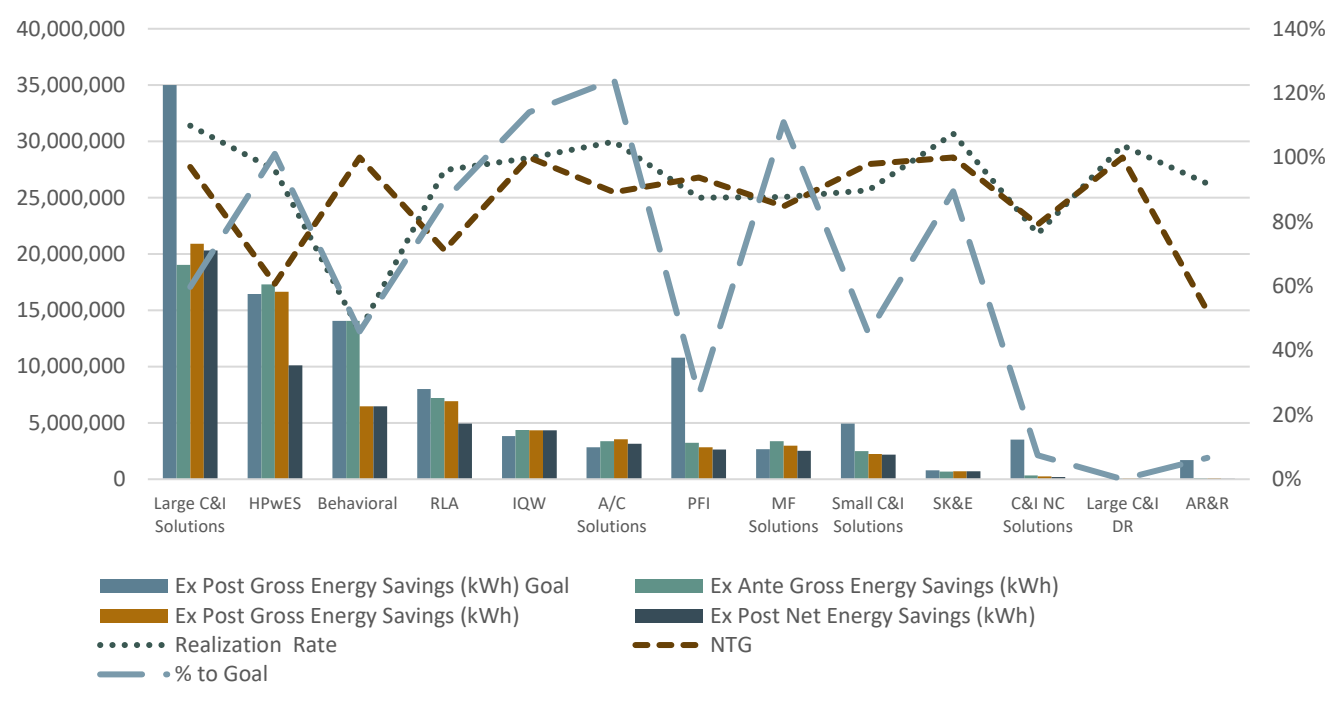


FIGURE 2-1 ENERGY SAVINGS (KWH) SUMMARY BY PROGRAM

TABLE 2-8 PORTFOLIO ENERGY SAVINGS (KWH) RESULTS

PY13 Programs	*Ex Ante* Energy (kWh)	*Ex Post* Gross Energy (kWh)	*Ex Post* Net Energy (kWh)	*Ex Post* Gross Energy (kWh) Goal	RR	NTG Ratio	% to kWh Goal
HPwES	17,302,866	16,643,910	10,106,743	16,461,506	96%	61%	101%
RLA	7,213,086	6,926,676	4,929,492	7,997,811	96%	71%	87%
MF Solutions	3,389,330	2,971,658	2,519,333	2,678,475	88%	85%	111%
IQW	4,363,127	4,355,709	4,355,709	3,817,679	100%	100%	114%
A/C Solutions	3,373,191	3,538,524	3,155,116	2,848,496	105%	89%	124%
SK&E	663,786	712,976	712,976	797,088	107%	100%	89%
AR&R	123,544	113,457	59,289	1,701,810	92%	52%	7%
Behavioral	14,067,914	6,466,294	6,466,294	14,067,914	46%	100%	46%
EasyCool (BYOT)	0	0	0	NA	NA	NA	NA
PTR Pilot	0	0	0	NA	NA	NA	NA
BESS Pilot	0	0	0	NA	NA	NA	NA
Small C&I Solutions	2,486,454	2,400,157	2,400,157	4,925,994	97%	100%	49%
Large C&I Solutions	19,036,327	20,886,316	20,050,863	35,008,874	110%	96%	60%
PFI	3,233,597	2,935,278	2,671,103	10,799,767	91%	91%	27%
C&I NC Solutions	343,381	261,865	141,407	3,512,971	76%	54%	7%
Large C&I DR	69834	72,445	72,445	NA	104%	100%	NA
EV Charging Pilot	0	0	0	NA	NA	NA	NA
Total	**75,666,436**	**68,285,264**	**57,640,926**	**104,618,385**	**90%**	**84%**	**65%**

Sums may differ due to rounding.

TABLE 2-9 PORTFOLIO DEMAND REDUCTIONS (KW) RESULTS

PY13 Programs	*Ex Ante* Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	*Ex Post* Net Savings (kW)	*Ex Post* Gross Savings (kW) Target	RR	NTG Ratio	% to kW Target
HPwES	1,015.77	1,014.48	809.52	NA	100%	80%	NA
RLA	1,087.39	1,057.33	735.80	NA	97%	70%	NA
MF Solutions	874.54	769.32	650.65	NA	88%	85%	NA
IQW	2,019.07	1,986.43	1,986.43	NA	98%	100%	NA
A/C Solutions	1,441.94	1,498.68	1,334.21	NA	104%	89%	NA
SK&E	82.04	89.86	89.86	NA	110%	100%	NA
AR&R	13.97	14.10	7.39	NA	101%	52%	NA
Behavioral	0.00	1,091.12	1,091.12	NA	NA	100%	NA
EasyCool (BYOT)	5,346.79	3,984.08	3,984.08	9,600.00	75%	100%	42%
PTR Pilot	0.00	200.46	200.46	714.00	NA	100%	28%
BESS Pilot	86.21	80.27	80.27	135.00	93%	100%	59%
Small C&I Solutions	277.21	296.19	296.19	NA	107%	100%	NA
Large C&I Solutions	2,083.99	3,378.43	3,243.29	NA	162%	96%	NA
PFI	253.52	335.55	305.35	NA	132%	91%	NA
C&I NC Solutions	57.44	57.84	31.23	NA	101%	54%	NA
Large C&I DR	3,720.21	3,019.95	3,019.95	6,970.00	81%	100%	43%
EV Charging Pilot	0.00	49.42	49.42	525.00	NA	100%	9%
Total	**17,944.00**	**18,360.08**	**18,923.50**	**17,915.22**	**103%**	**95%**	**102%**

Sums may differ due to rounding.

TABLE 2-10 PORTFOLIO LIFETIME ENERGY SAVINGS (KWH) RESULTS

PY13 Programs	*Ex Post* Gross Energy Savings (kWh)	*Ex Post* Net Energy Savings (kWh)	EUL	*Ex Post* Gross Lifetime Energy Savings (kWh)	*Ex Post* Net Lifetime Energy Savings (kWh)
HPwES	16,643,910	10,106,743	4	61,987,778	44,824,162
RLA	6,926,676	4,929,492	3	23,560,592	17,653,686
MF Solutions	2,971,658	2,519,333	14	40,334,824	34,372,520
IQW	4,355,709	4,355,709	15	63,916,360	63,916,360
A/C Solutions	3,538,524	3,155,116	10	33,824,246	30,425,527
SK&E	712,976	712,976	8	5,415,907	5,415,907
AR&R	113,457	59,289	17	1,902,364	992,990
Behavioral	6,466,294	6,466,294	1	6,466,294	6,466,294
EasyCool (BYOT)	0	0	1	0	0
PTR Pilot	0	0	1	0	0
BESS Pilot	0	0	1	0	0
Small C&I Solutions	2,400,157	2,400,157	13	30,097,497	30,097,497
Large C&I Solutions	20,886,316	20,050,863	14	294,672,064	282,885,182
PFI	2,935,278	2,671,103	14	40,394,288	36,758,802
C&I NC Solutions	261,865	141,407	15	3,862,686	2,085,851
Large C&I DR	72,445	72,445	1	72,445	72,445
EV Charging Pilot	0	0	1	0	0
Total	**68,285,264**	**57,640,926**	**9**	**606,507,345**	**555,967,222**

Sums may differ due to rounding.

Each bar in the figure below shows the contributions to *ex ante* gross energy savings (kWh) for each measure in the commercial sector. LED lighting (51%), building automation software (23%), and HVAC (18%) were the high impact measures, and equal to 92% of C&I *ex post* energy savings.

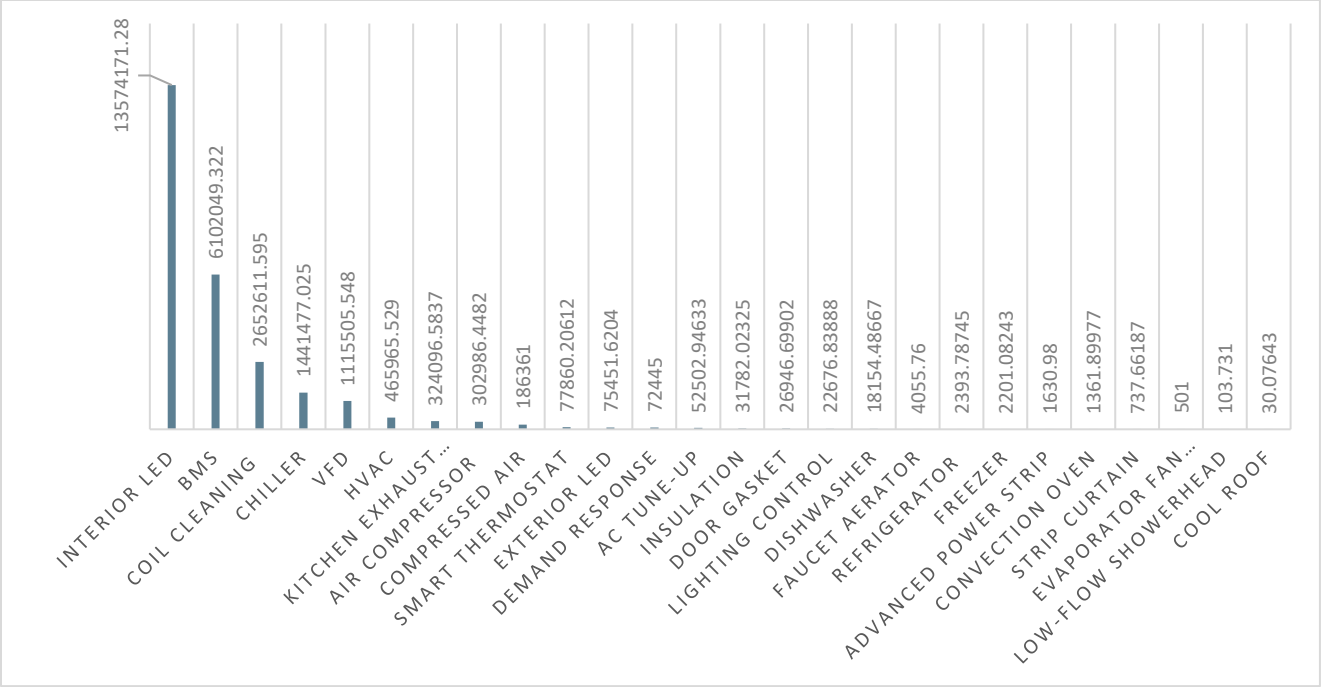


FIGURE 2-2 C&I *EX POST* KWH BY MEASURE

Each bar in the figure below shows the contributions to energy savings for each measure in the residential sector. LED lamps (54%), duct sealing (21%), and behavioral (15%) are the high impact measures, and equal to 91% of residential *ex post* energy savings.

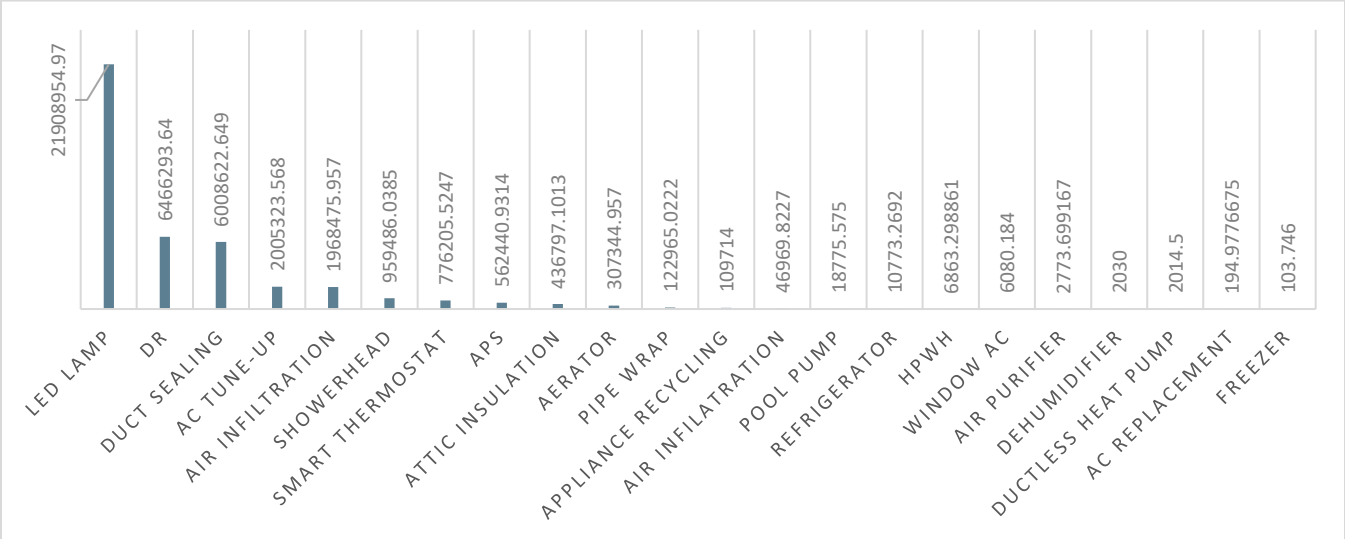


FIGURE 2-3 RESIDENTIAL *EX POST* BY MEASURE

A summary of participation and gross incentive spent by program can be found in the table below.

TABLE 2-11 PARTICIPATION AND INCENTIVE SPEND BY PROGRAM

Program	Count of Participants	Gross Incentive Expenditures ($)
HPwES	217,845	$1,446,570
RLA	204,744	$634,564
MF Solutions	20,119	$717,113
IQW	16,242	$1,971,880
A/C Solutions	3,145	$568,439
SK&E	41,020	$94,346
AR&R	202	$85,100
Behavioral	76,778	$0
EasyCool (BYOT)	6,126	$230,725
PTR Pilot	2,572	$12,880
BESS Pilot	17	$9,350
Small C&I Solutions	9,716	$292,395
Large C&I Solutions	79,978	$2,346,572
PFI	24,728	$307,720
C&I NC Solutions	114	$31,856
Large C&I DR	18	$186,011
EV Charging Pilot	102	$3,458
Total	**703,466**	**$8,938,981**

Sums may differ due to rounding.

Budgets and expenditures are summarized in the table below.

TABLE 2-12 BUDGETS AND ACTUAL SPEND SUMMARY

Program	Budgeted Expenditures	Actual Expenditures	Spending (% of Budget)	Energy Savings (% of Goal)	Levelized ($ per kWh)
HPwES	$2,533,365	$2,074,409	82%	101%	$0.051
RLA	$1,632,415	$1,098,581	67%	87%	$0.084
MF Solutions	$977,319	$1,030,305	105%	111%	$0.045
IQW	$2,544,729	$2,680,505	105%	114%	$0.076
A/C Solutions	$1,223,882	$792,747	65%	124%	$0.041
SK&E	$319,682	$316,944	99%	89%	$0.076
AR&R	$559,357	$362,820	65%	7%	$0.237
Behavioral	$607,174	$556,195	92%	46%	$0.086
EasyCool (BYOT)	$923,098	$788,142	85%	NA	$0.000
PTR Pilot	$276,920	$240,698	87%	NA	$0.000
BESS Pilot	$79,864	$66,742	84%	NA	$0.000
Small C&I Solutions	$1,105,876	$653,896	59%	49%	$0.036
Large C&I Solutions	$7,221,218	$5,311,455	74%	60%	$0.029
PFI	$2,616,243	$1,295,405	50%	27%	$0.041
C&I NC Solutions	$898,380	$669,638	75%	7%	$0.182
Large C&I DR	$914,821	$616,617	67%	NA	$8.512
EV Charging Pilot	$198,756	$123,846	62%	NA	$0.000
Total	**$24,633,099**	**$18,678,943**	**76%**	**65%**	**$0.047**

Sums may differ due to rounding.

2.1.3 PROCESS EVALUATION FINDINGS

The process evaluation for the residential and commercial and industrial (C&I) programs encompassed a wide array of activities aimed at comprehensively assessing program efficacy and operational processes. These activities included:

- Staff Interviews: Engaging program staff in interviews to gain insights into program implementation, challenges, and successes, as well as to gather perspectives on areas for improvement.
- Site Visits: Conducting on-site visits to program locations to observe operations, assess program delivery, and gather firsthand information on program execution and impact.
- Participant Surveys: Administering surveys to program participants to solicit feedback on their experiences, satisfaction levels, and perceptions of program effectiveness.
- Trade Ally Interviews: Interviewing trade allies involved in program delivery to understand their perspectives, challenges, and recommendations for enhancing collaboration and program outcomes.
- Property Manager Interviews: Interviewing property managers to gather insights into their engagement with the program, experiences with program implementation, and suggestions for program improvement.
- Review of Program Documentation: Thoroughly reviewing program documentation, including program guidelines, protocols, and procedural documents, to assess program structure and alignment with objectives.
- Review of Forward-Facing Materials: Analyzing forward-facing materials such as program brochures, websites, and promotional materials to evaluate their effectiveness in communicating program offerings and engaging stakeholders.

By undertaking these comprehensive evaluation activities across various program components and stakeholder groups, the evaluation team was able to gain a multifaceted understanding of program dynamics, strengths, and areas for enhancement. This holistic approach facilitated the generation of actionable insights and recommendations to inform program refinement and optimization efforts.

2.1.3.1 Residential Special Study Findings and Recommendations

2.1.3.1.1 *Cross Program Participant Findings*

The evaluation yielded key findings and conclusions that shed light on the motivations and impacts of residential energy efficiency programs:

- Cost Savings Motivation: Participants across residential programs consistently cited cost savings as a primary motivation for engaging with the program. The promise of reduced energy bills emerged as a compelling incentive for customers, underlining the significance of financial benefits in driving participation and adoption of energy-efficient measures.
- Impact of Program Incentives: Survey respondents highlighted the critical role of incentives and assistance in facilitating major energy conservation measures. Many of these measures, while essential for energy conservation, were often financially prohibitive for customers without external support. The programs were instrumental in bridging this gap by providing incentives and affordable solutions,

thereby enabling customers to implement necessary improvements that they may have otherwise deemed unattainable.

- These findings underscore the pivotal role played by residential energy efficiency programs in empowering customers to achieve energy savings, mitigate costs, and implement impactful conservation measures. By addressing financial barriers and providing accessible solutions, these programs effectively facilitate the adoption of energy-efficient practices, contributing to both economic savings and environmental sustainability.

2.1.3.1.2 *Cross Program Participant Recommendations*

Following the completion of the evaluation, the following key recommendations have been identified to optimize program effectiveness and customer engagement:

- Leverage Email Communication: Given the high responsiveness of customers to email communications about the program, it is recommended to continue prioritizing email as a primary communication channel. Consistent and targeted email campaigns can effectively reach and engage customers, maximizing program visibility and participation.
- Provide Comprehensive Program Details: It is imperative to ensure that program communications deliver accurate and comprehensive information regarding program details, requirements, and potential savings. Customers are primarily motivated by the prospect of saving money on their energy bills, thus emphasizing the tangible benefits and practical steps required to realize these savings will enhance program appeal and encourage participation. Additionally, providing tips and assistance related to achieving energy bill savings can further empower customers in their energy efficiency efforts.

By adhering to these recommendations, the program can enhance its communication strategies, foster greater customer understanding and engagement, and ultimately achieve its objectives of promoting energy efficiency and cost savings for participants.

2.1.3.1.3 *Residential Non-Participant Survey*

Evaluators conducted a survey of residential customers who had not participated in an Energy Smart program to gain insight into the awareness of Entergy New Orleans residential energy-efficiency programs, willingness to participate in those programs, the perception of energy-efficiency, and the perception of Entergy New Orleans more generally. Hundreds of Entergy New Orleans customers were initially contacted to complete the online survey (Table 2-13). Of the total emails sent (including reminders), about half opened the emails; however, under one in ten completed the survey. To help increase the number of respondents, respondents who had not completed the survey, had not opened the survey, or had a different email listed were then contacted via phone through a market research firm, NOLA perspectives, to complete the survey. A further 25 respondents were gathered via phone survey. A $25 incentive was offered to customers who completed the survey.

TABLE 2-13 NON-PARTICIPANT SURVEY RESPONSE BREAKOUT

Distribution Type	n
Email	
Email Completes	191
Email Incompletes	202
Email Disqualified	51
Total Email Survey Starts	444
Phone Calls	
Phone Call Completes	25
Phone Call Incompletes	29
Phone Call Disqualified	11
Phone Calls Started Survey	65

2.1.3.1.3.1 Satisfaction

Among those customers who had not participated in an Energy Smart program, slightly more respondents are dissatisfied with the brand than satisfied. Half of non-participants would be somewhat or very likely to switch electric utility companies if one were available.

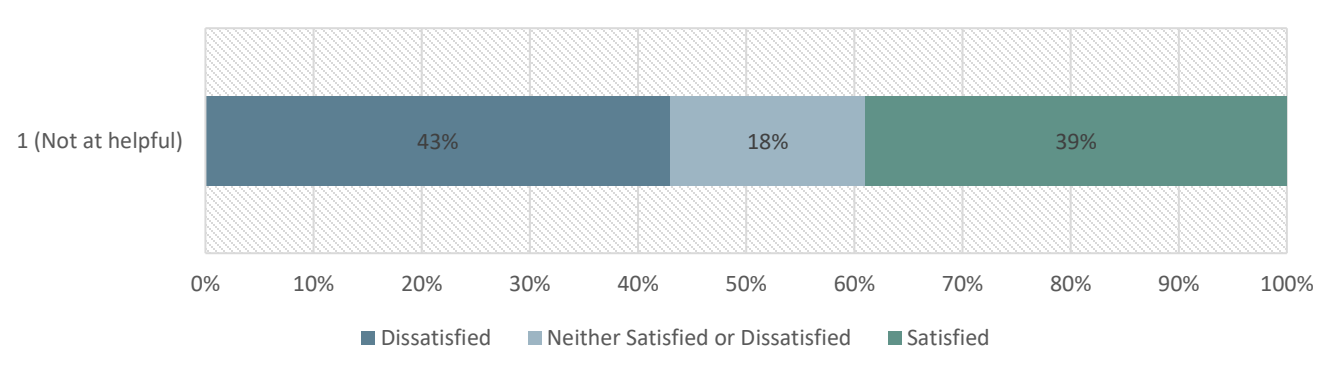


FIGURE 2-4 SATISFACTION WITH ENTERGY (N=216)

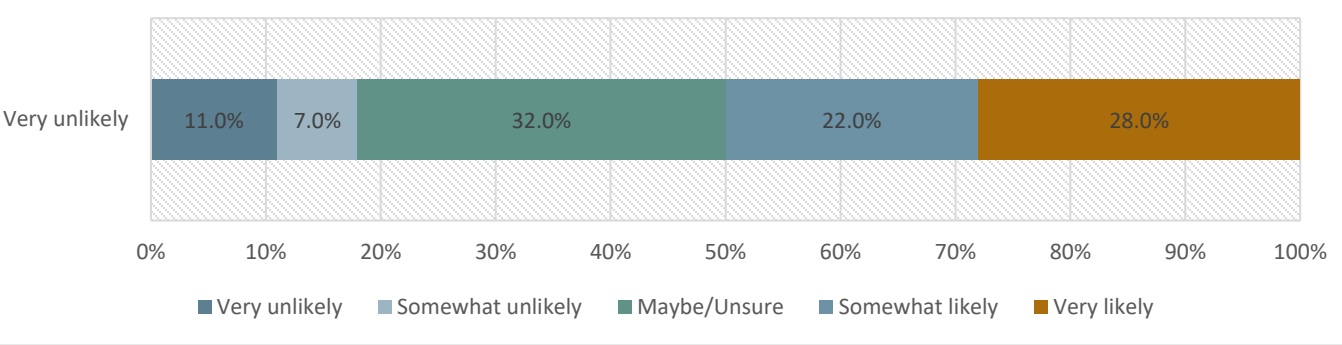


FIGURE 2-5 LIKELIHOOD TO SWITCH TO A NEW ELECTRIC UTILITY COMPANY IF ONE WERE AVAILABLE (N=216)

The overall impression of the programs among non-participants exhibited a diverse range of sentiments, with opinions fairly evenly distributed among unfavorable, neutral, and favorable views. Specifically, approximately one-third of non-participants expressed an unfavorable view of the program brand, while another one-third

maintained a neutral stance. Conversely, the remaining one-third of non-participants held a favorable perception of the programs.

This split in favorability underscores the varied perspectives and perceptions held by individuals who have not engaged directly with the programs. It highlights the importance of targeted outreach and communication efforts to address potential concerns or misconceptions among non-participants and to effectively convey the value proposition and benefits of program participation. By understanding and addressing the factors influencing favorability, program administrators could implement strategies to enhance overall program appeal and attract a broader base of participants.

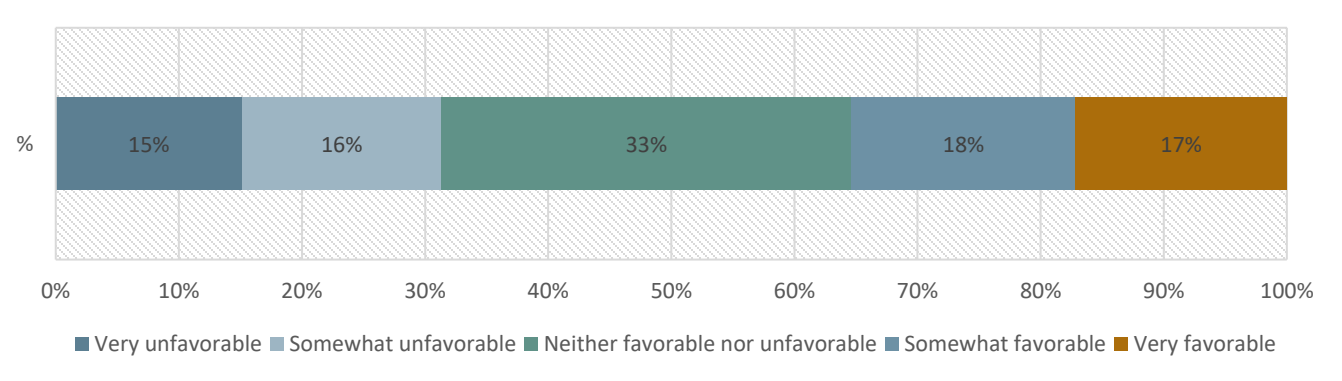


FIGURE 2-6 OVERALL IMPRESSION OF ENTERGY (N=216)

2.1.3.1.3.2 Energy Efficient Behaviors

A significant majority of respondents, comprising 88% of the surveyed population, prioritize energy efficiency considerations when making purchasing decisions for electric appliances. This heightened awareness of energy efficiency extends across a variety of household appliances, including air conditioning units, washing machines, dryers, and refrigerators.

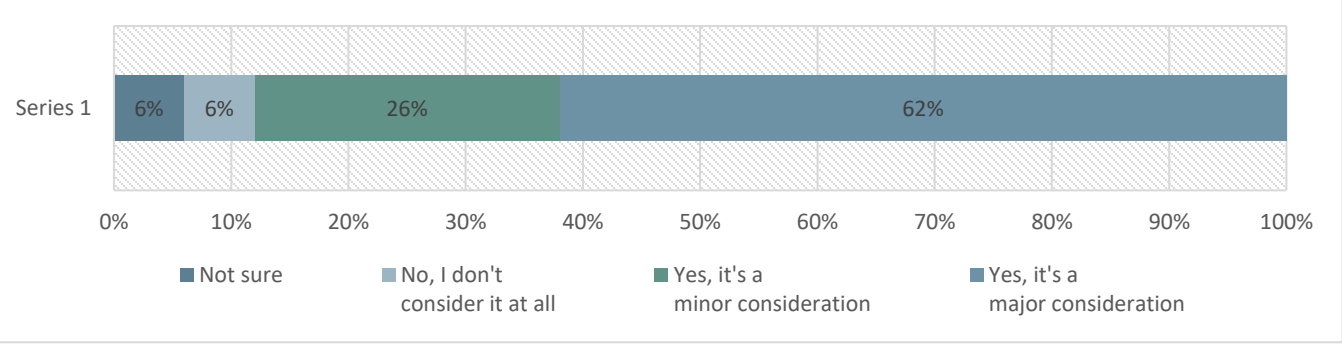


FIGURE 2-7 CONSIDERATION OF ENERGY EFFICIENCY WHEN PURCHASING ELECTRIC APPLIANCES (N=216)

Most respondents have a favorable opinion of energy conservation behaviors (65.7%, n=142) and just over half say they would be willing to spend more for an energy-efficient appliance over a conventional one (52%, n=112).

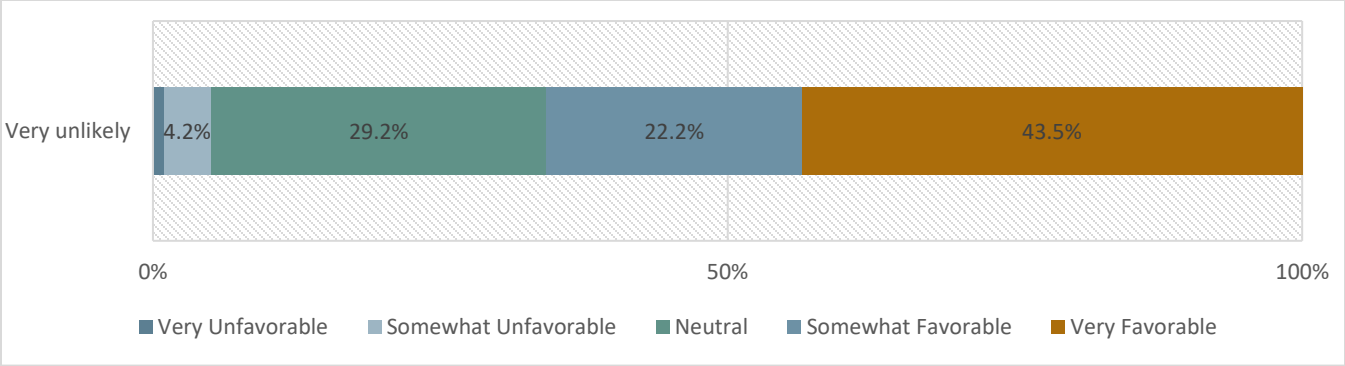


FIGURE 2-8 OVERALL IMPRESSIONS OF BEHAVIORS THAT IMPROVE ENERGY EFFICIENCY, REDUCE ENERGY, AND ARE GOOD FOR THE ENVIRONMENT (N=216)

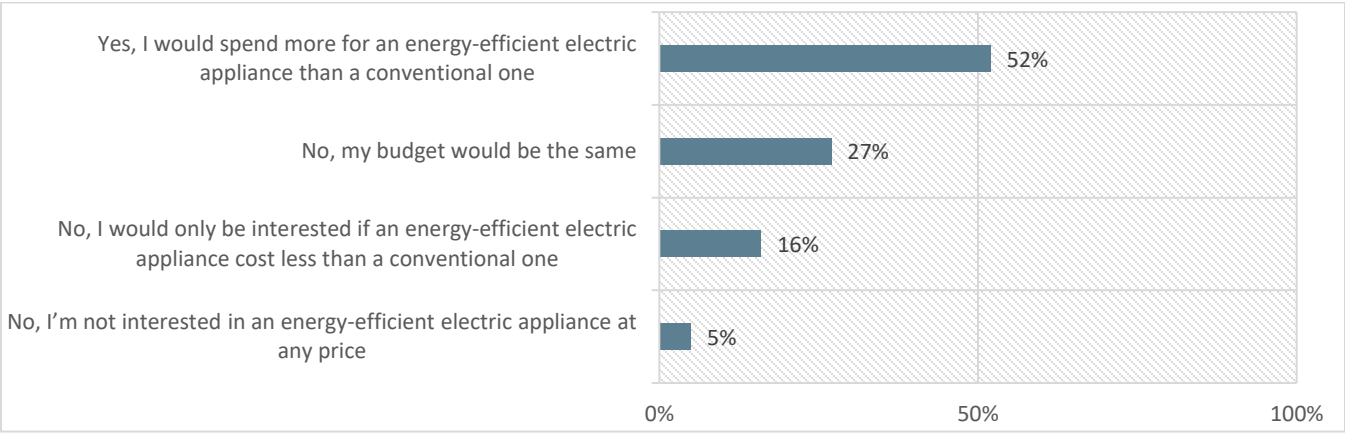


FIGURE 2-9 WILLINGNESS TO SPEND MORE FOR ENERGY-EFFICIENT APPLIANCES (N=216)

Furthermore, a substantial portion of respondents, accounting for over half at 55.1% (n=119), have undertaken equipment replacements or upgrades within the last three years. Among this group of respondents who have engaged in equipment replacements or upgrades, lighting emerges as the most commonly upgraded component. Notably, other frequently replaced or upgraded items include smart thermostats and HVAC (heating, ventilation, and air conditioning) equipment, as indicated in the tables below.

It is noteworthy that despite the prevalence of equipment replacements or upgrades, none of the respondents who undertook such actions reported receiving incentives from the programs for these upgrades. This observation suggests a potential gap in program outreach or awareness among consumers who have already demonstrated a willingness to invest in energy-efficient upgrades. Addressing this gap by enhancing program visibility and accessibility to consumers engaging in equipment replacements or upgrades could yield opportunities to further incentivize and support energy-efficient investments.

TABLE 2-14 ELECTRICAL EQUIPMENT REPLACEMENT IN THE LAST THREE YEARS (N=216)

Equipment upgrades/replacement	n
Lighting	72
Smart thermostat(s)	50
HVAC equipment	43
A/C tune-up	36
Low flow showerheads	24
Advanced power strips	16
Low flow faucet aerators	9
Home energy assessment	7
Other	28

The majority of respondents who do not participate in any of the programs say they do not know enough about the programs or the incentives to warrant participation. Additionally, some consumers report that incentives are too low and not worth the trouble and that energy savings from replacing equipment are not worth the trouble (Table 2-15).

TABLE 2-15 REASONS FOR NOT PARTICIPATING IN ENTERGY'S PROGRAMS (N=119)

Equipment upgrades/replacement	n
Did not know enough about the programs and incentives	72
I was financially able to make the upgrades without the incentives	19
Preferred not to deal with Entergy	14
Too much time or trouble to receive the incentives	12
Incentives were not high enough to offset the cost of high efficiency equipment, compared to standard efficiency equipment	11
Didn't have the authority to participate in any of the Entergy programs	10
Energy savings from the equipment replacements or upgrades was not worth the trouble	9
Not interested in what Entergy was offering	8
Other	10
Don't know	10

Two out of three consumers believe their HVAC system uses the most energy of their appliances. About one in ten consumers believe lighting or refrigeration uses the most energy.

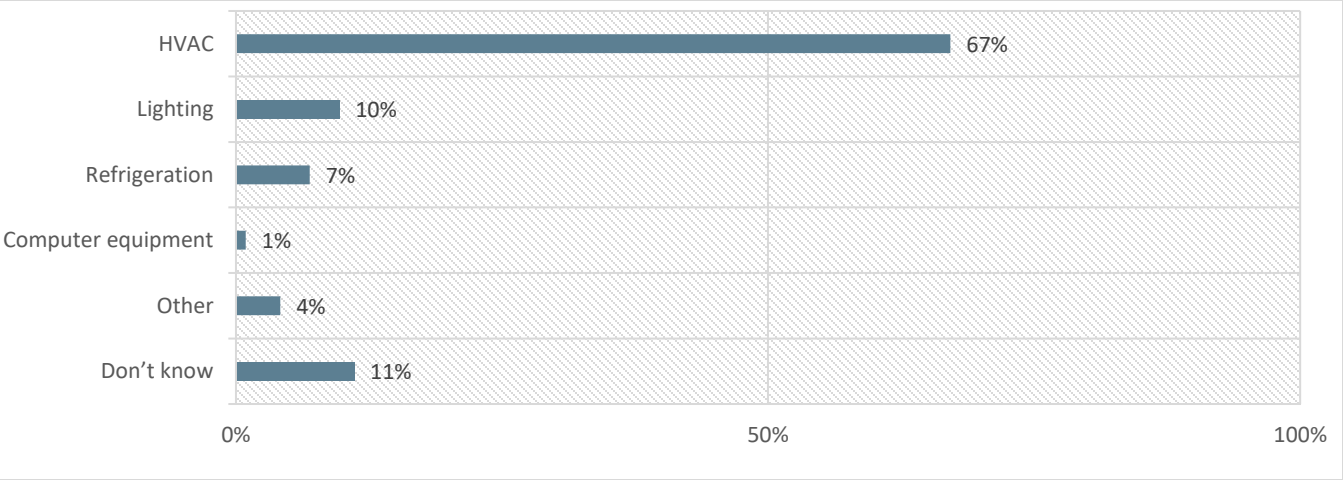


FIGURE 2-10 APPLIANCES CONSUMERS ASSUME USE THE MOST ENERGY (N=216)

2.1.3.1.3.3 Program Awareness

Awareness among non-participants of the programs is low. Respondents are most aware of the HPwES program; however, just about one-third are aware of that program.

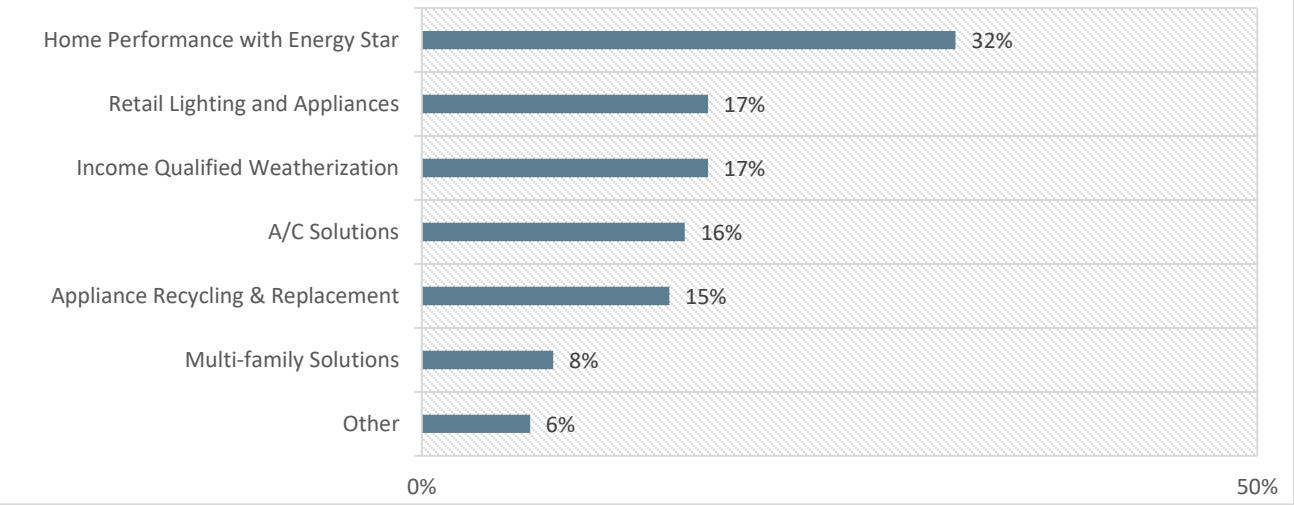


FIGURE 2-11 AWARENESS OF ENERGY-EFFICIENCY PROGRAMS OFFERED BY ENTERGY (N=216)

Among respondents who aware of any programs (n=95), direct communication from the programs was the most frequent program awareness source (Table 2-16).

TABLE 2-16 ENTERGY ENERGY EFFICIENCY PROGRAM AWARENESS (N=95)

Source	n
Email from Entergy	55%
Mailed information from Entergy	24%
Utility bill message	23%
Utility website	20%
Family member, friend, neighbor, colleague, etc.	12%
Social media (i.e., Facebook, Instagram, Twitter, Tik Tok, etc.)	5%
Newspaper or magazine article or advertisement	4%
Contractor	4%
Information at a retailer	3%
Radio advertisement	1%
Another website	1%
Entergy program staff	1%
Other	5%

Almost half of respondents said they would or may be interested in the programs, but most would still need additional information.

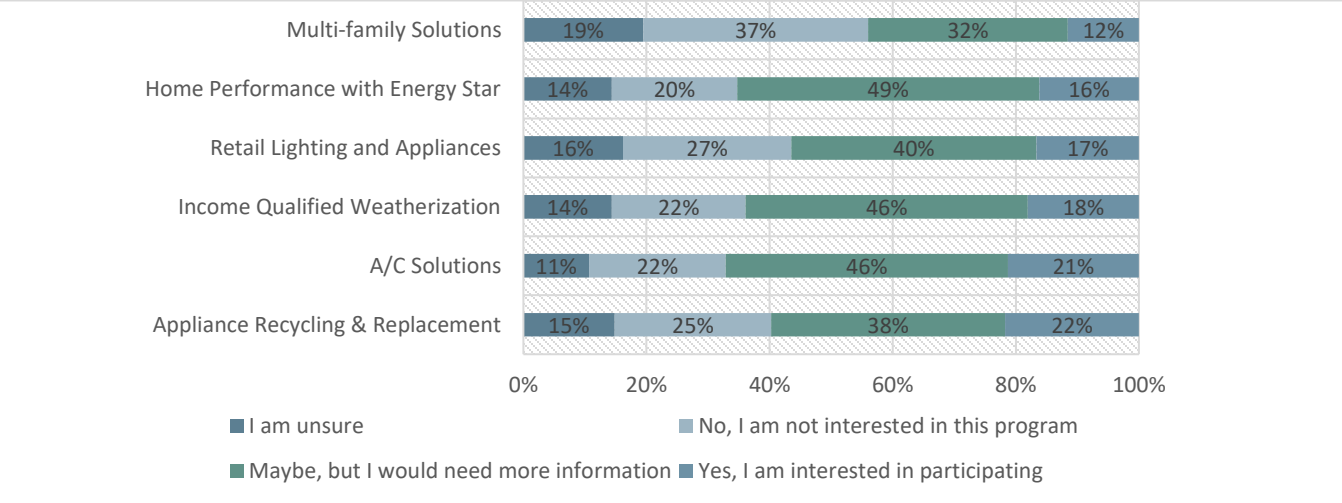


FIGURE 2-12 INTEREST IN PARTICIPATING IN ENTERGY PROGRAMS (N= 216)

2.1.3.1.3.4 Building Information

More than half of the non-participant respondents are aware of the types of light bulbs they have at home. Most of these respondents indicated they have LED lamps installed.

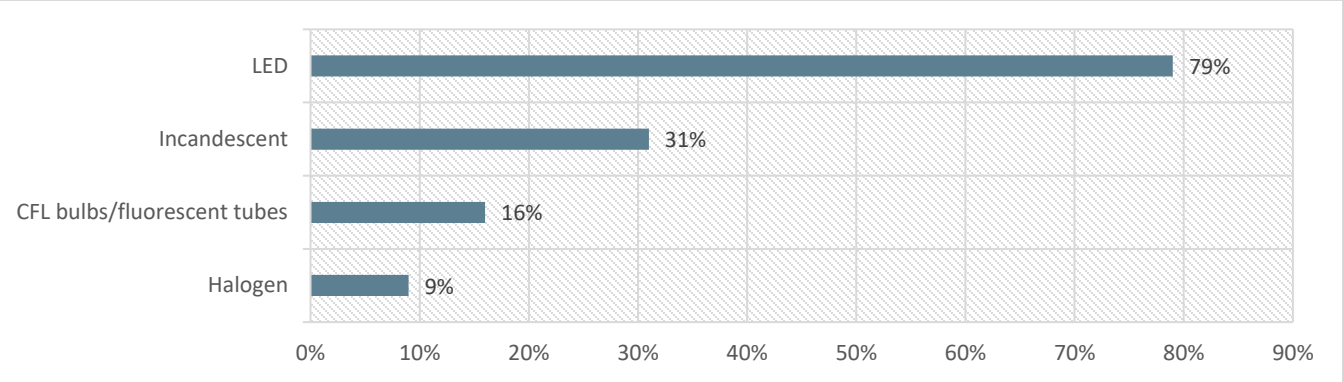


FIGURE 2-13 LIGHTING TYPE CURRENTLY IN HOME (N=216)

Nearly all respondents have air conditioning at home (97%). These respondents are most likely to have a central A/C. Among those aware of their home air condition unit type, just over half reported that it is less than ten years old. About one-third of respondents have air conditioning units more than 10 years old.

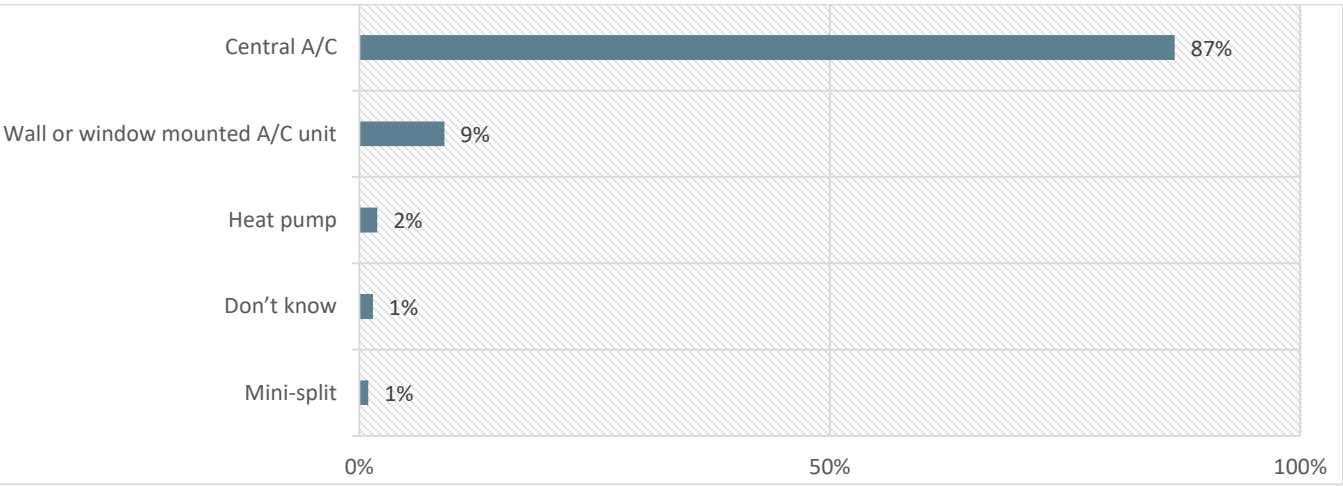


FIGURE 2-14 TYPE OF AIR CONDITIONING IN HOME (N=210)

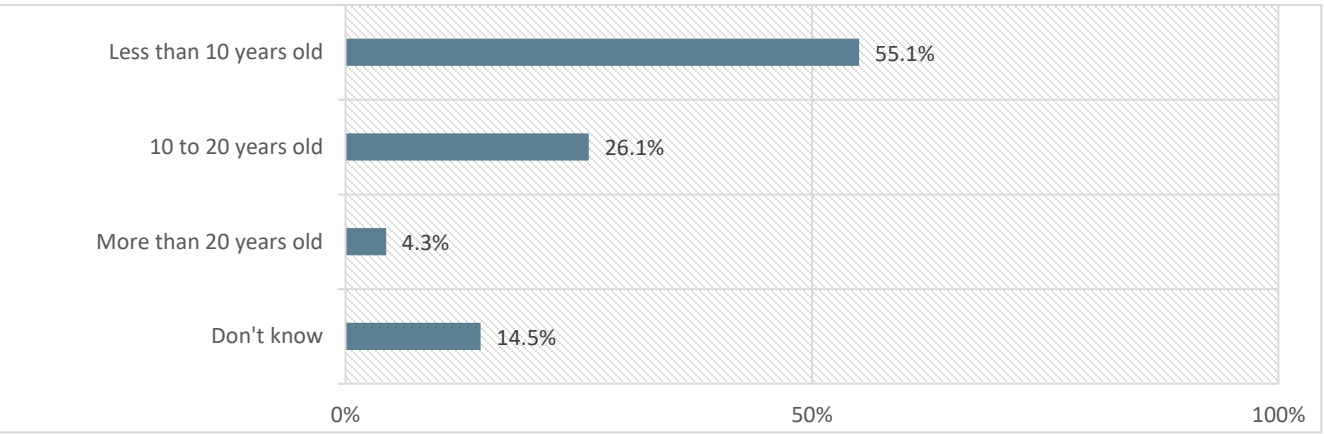


FIGURE 2-15 APPROXIMATE AGE OF AIR CONDITIONING SYSTEM (N=207)

Forty percent of respondents have a gas furnace heating system in their home. Nearly a third are unsure of their home heating system.

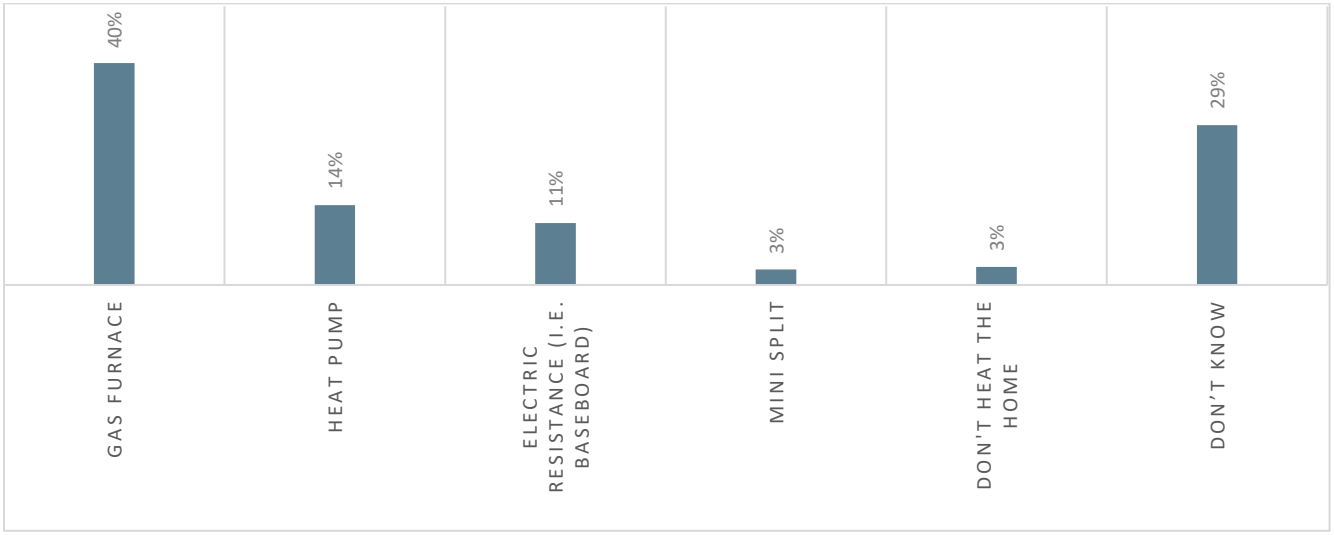


FIGURE 2-16 TYPE OF HEATING SYSTEM IN HOME (N=216)

Among those aware of the type of heating system at home, half report that the system is less than 10 years old.

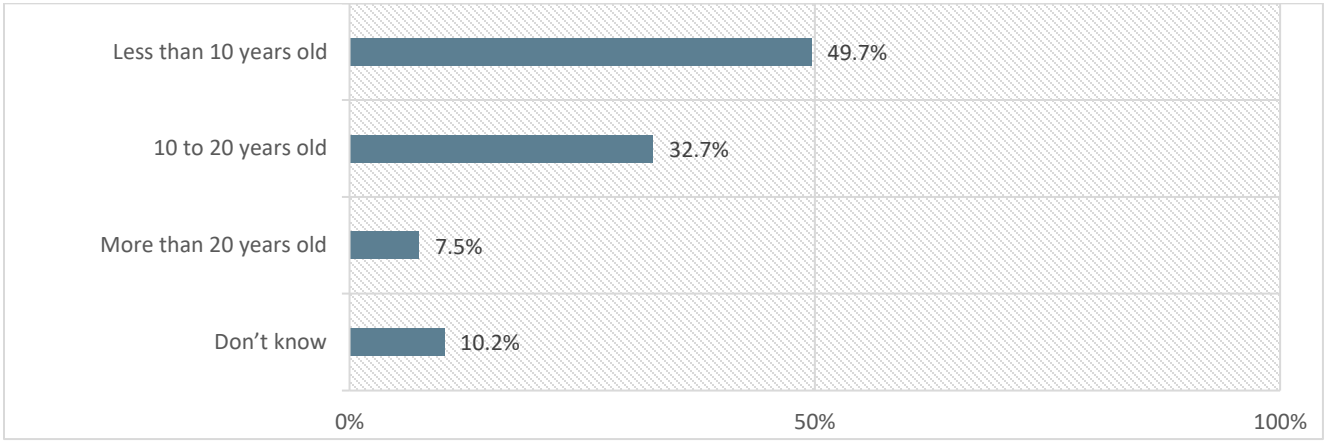


FIGURE 2-17 HOW OLD IS THE HEATING SYSTEM IN HOME (N=147)

About half of the non-participant respondents most recently had their heating/cooling system serviced in the past year and about three-quarters have had it serviced within the past 3 years.

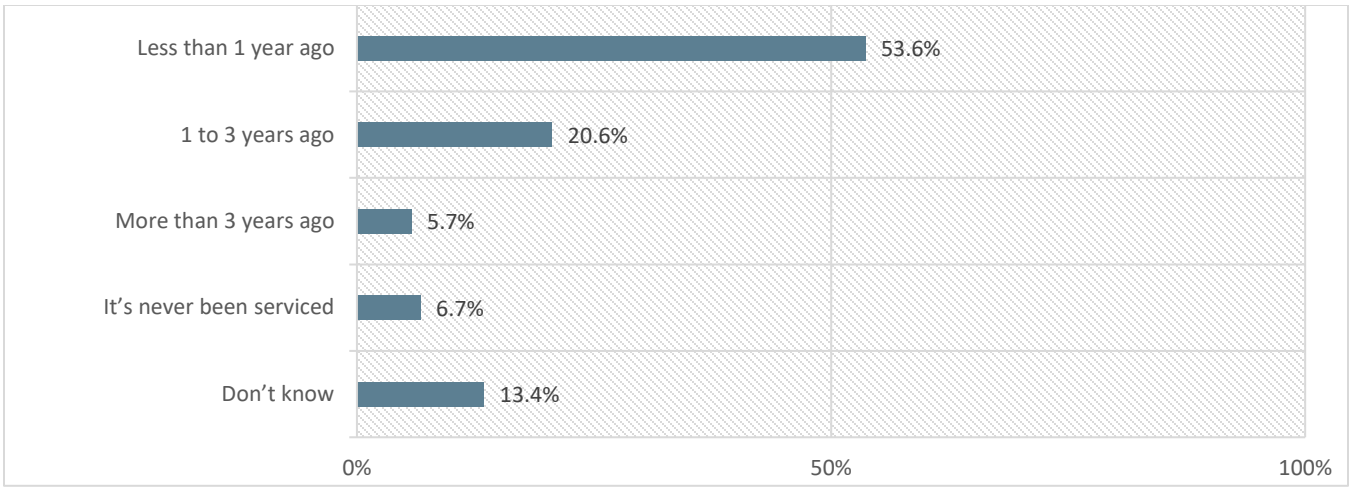


FIGURE 2-18 LAST TIME HEATING/COOLING SYSTEM WAS SERVICED (N=209)

Just under a third of respondents have a smart thermostat. Among the remainder, about an equal share of respondents have either a programmable or manual thermostat.

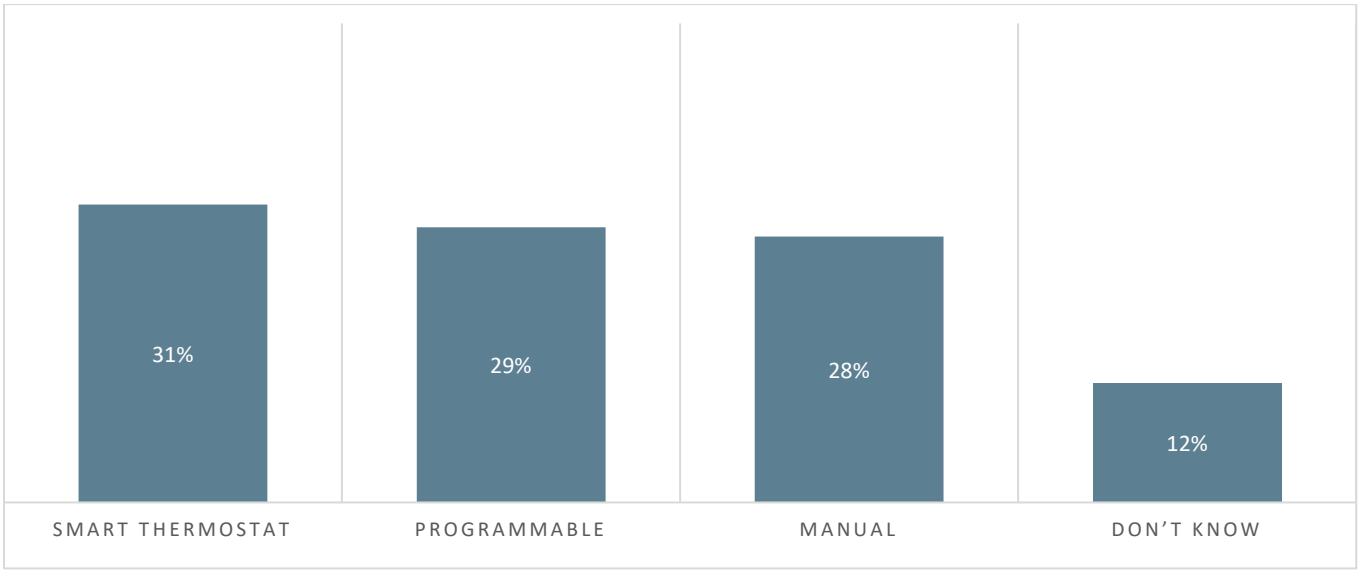


FIGURE 2-19 TYPE OF THERMOSTAT USE (N=209)

2.1.3.1.3.5 Findings and Recommendations

Findings are as follows:

- Respondents generally hold favorable opinions and perceptions regarding energy-efficient appliances and practices, considering them as significant factors in their purchasing decisions. While energy efficiency is valued by most consumers, only half indicated willingness to spend more on energy-efficient appliances compared to conventional ones.
- Awareness of the programs among non-participants is notably low. Nevertheless, nearly half of all respondents expressed potential interest in participating in the programs.

Recommendations are as follows:

- The programs should actively communicate the dual benefits of cost savings and energy efficiency inherent in its programs to customers. Highlighting these advantages can effectively demonstrate the value proposition and incentivize participation.
- The programs should persist in its endeavors to disseminate information about its energy efficiency programs. Given that many respondents have already encountered the program primarily through email communications, leveraging this channel can be effective. Emphasizing both the energy efficiency and cost-saving aspects of the programs could also enhance ENO's appeal to customers contemplating appliance purchases.

2.1.3.1.4 *Residential Non-Participant Trade Ally Focus Group*

In an endeavor to comprehensively grasp the challenges hindering trade allies' engagement with the program and to discern potential strategies for enhancing diverse trade ally participation, evaluators conducted two focused group sessions with nonparticipating trade allies operating within the service territory. These sessions delved into various aspects including local labor market dynamics, hiring practices, staffing considerations, training hurdles, program awareness levels, and barriers impeding participation.

To facilitate the recruitment process, evaluators enlisted the expertise of New Orleans Perspectives, a locally-based firm specializing in targeted focus group recruitment. Detailed verbal and written descriptions of the programs along with articulated goals and objectives were provided to New Orleans Perspectives. Additionally, scripts for phone and email communications were supplied, with the understanding that modifications could be made as per the specific audience and recruitment channels. A screening survey, encompassing seven questions related to participation history and demographics, was administered by New Orleans Perspectives to potential recruits.

The two focus groups convened a total of 13 participants, with one group focusing primarily on trade allies operating within the residential sector (n=7), while the other targeted those predominantly engaged in the commercial sector (n=6). Notably, participants in both groups indicated involvement across both residential and commercial domains, although the discussions were tailored to the specific sectoral focus of each group. Each session spanned approximately 90 minutes, allowing for in-depth exploration of pertinent themes and issues.

2.1.3.1.4.1 Research Objectives

The objectives of conducting these focus groups were multifaceted, aiming to gain comprehensive insights into various aspects related to nonparticipating trade allies and their interactions with the programs. The primary objectives were as follows:

- Gain Insight and Build Rapport: The focus groups sought to establish a platform for open dialogue with nonparticipating trade allies, fostering rapport and trust. Through candid discussions, the aim was to document the challenges, struggles, and pain points experienced by trade allies in their current business operations.

- Understand Business Owner Challenges: Delving into the challenges faced by business owners, particularly within the context of the local labor market, was a key objective. By understanding these challenges, the focus groups aimed to identify areas where support and intervention may be needed to address barriers to participation and facilitate business growth.
- Explore Awareness and Barriers to Participation: Assessing the awareness levels of trade allies regarding existing programs and pinpointing the barriers hindering their participation were critical objectives. Understanding these factors provided valuable insights into the reasons behind nonparticipation and informed strategies to enhance program accessibility and engagement.
- Code Changes: The focus groups sought to gauge participants' opinions and reactions to recent code changes. Understanding their perspectives on these regulatory developments was essential for assessing their potential impact on business operations and identifying any associated challenges or opportunities.
- Identify Reasons for Nonparticipation: By probing into the reasons why trade allies were not participating in the programs, the focus groups aimed to uncover underlying barriers, concerns, or misconceptions that may be inhibiting program uptake. This information was instrumental in refining program strategies and addressing barriers to participation effectively.
- Identify Opportunities for Engagement and Support: Finally, the focus groups aimed to identify actionable insights on how the programs could better engage and support nonparticipating trade allies. This encompassed identifying specific barriers, pain points, and support needs faced by contractors in their business operations, with the ultimate goal of enhancing program accessibility and efficacy.

Overall, these objectives collectively guided the focus group discussions, facilitating a comprehensive exploration of key issues and informing targeted strategies to improve program outreach, engagement, and support for nonparticipating trade allies.

2.1.3.1.4.2 Demographics

Focus group participants self-reported as sole proprietors, owners, or employees of, in most cases, small and diverse businesses (n=7). All focus group participants were program nonparticipants, meaning they had never engaged with the programs. Focus group participants self-reported their demographic information (Table 2-17).

TABLE 2-17 RESIDENTIAL TRADE ALLIES (N=7)

Self-Reported Demographic	Respondents (n)
Gender	3 female 4 male
Race	4 African American/Black 1 Asian 2 Caucasian/White
Sexuality	1 LGBTQ+
Owner/Not owner	4 owner 3 not owner
Diversity certification/ No diversity certification	3 certified 4 not certified
HUBzone/Not HUBzone	1 HUBzone 6 not HUBzone
Specialization(s)*	3 electricians 3 general residential contracting (building, renovating, HVAC) 2 inspection services 1 stonework/demolition/post-hurricane major whole house renovations 1 structural engineer

*Focus group participants could specialize in more than one area

2.1.3.1.4.3 Customers

The residential focus group participants reported serving a diverse array of customers, reflecting the breadth of their clientele. These included:

- Rental properties rented to students,
- Individuals and families, including single mothers, on fixed incomes,
- Low- to middle-income rental properties,
- Families who seek affordable services of an electrician,
- Neighbors within their local community,
- Realtors, with the aim of expanding their network of homebuyers,
- Referrals from previous satisfied customers, and
- Repeat customers who value their reliable services.

A unanimous consensus emerged among residential focus group participants regarding the most effective method for attracting new customers: word-of-mouth referrals. They emphasized the pivotal role of their reputation as a quality contractor in both retaining existing customers and garnering referrals. Direct marketing or advertising was generally not prioritized by the participants, with only one exception: a participant who

recognized the potential of listing their services in the Better Business Bureau, specifically targeting disadvantaged communities.

These insights underscore the significance of personal recommendations and reputation management within the residential contracting industry. By delivering high-quality services and nurturing positive relationships with customers, contractors can cultivate trust and loyalty, ultimately driving business growth through word-of-mouth referrals and repeat patronage.

> *[Starting] off, you just hustle, work hard, do a good job, and people are going to notice and they're going to tell their friends. So if you're doing things the right way, the customers will find you. – Residential TA*

> *A lot of consumers are numb to marketing at this point, and so word of mouth is their way to connect to reality and actually have something they can believe in. –Residential TA*

2.1.3.1.4.4 Struggles and Pain Points

When asked about the challenges their businesses are facing, all the focus group participants discussed changes in economic conditions. The cost of doing business is increasing, and focus group participants discussed increases in taxes, insurance, interest rates, and the cost of materials as having significant impact on their margins. Further, they discussed how these increased costs are raising the cost of living, which two focus group participants said is having a significant impact on the number of tenants not being able to pay.

There was consensus among focus group participants that insurance is a primary concern for their businesses. Since they work in an area affected by natural disasters, insurance prices are extremely high, especially as many insurance companies no longer offer coverage in the area. In fact, some residents are pursuing legal action on large claims, contributing to rising premiums and associated costs. One participant noted:

> *The common [belief] is if you make a claim yourself, then your next insurance premium is going to go up. That's actually not the case. You can make no claims for 20 years, but if …any of your neighbors are making claims that puts you in the same bucket. –Residential TA*

If a hurricane comes through and a few shingles come off my roof, [I'm] going to go up there and tap a few new shingles on…but what people are doing is a few shingles comes off…they tear off half of their roof, then they hire an attorney to make an assessment of it, and now they're fighting the insurance company for a hundred thousand dollars for a $500 fix. –Residential TA

The insights gleaned from focus group participants shed light on potential disparities between larger companies with the resources to navigate insurance complexities and smaller business owners serving limited or low-income residents. Notably, evaluators raise concerns regarding the possibility that more affluent homeowners might exploit natural disasters to prompt insurance replacements rather than repairs, thereby inflating insurance premiums for all and potentially disproportionately impacting small and diverse businesses and low-income households.

Additionally, focus group participants highlighted the challenge of escalating property taxes, which exacerbate shrinking profit margins. Two respondents specifically cited recent changes to property assessment ordinances, indicating that properties are now being assessed annually, further compounding financial pressures on businesses operating within the community.

So every single year I'm getting a new tax bill with assessors in the city saying, oh, you know what? John Doe here, he sold his property just last week for $300,000 more. Now price per square foot in your neighborhood has increased, which now [is how] they're justifying [why] your property taxes increased. –Residential TA

Those are broad issues that attach themselves to everyone at some point because it's going to drive up the tenants cost of living. – Residential TA

One focus group participant noted that to continue doing business, they have to lower the quality of the materials and products they use in order to make a profit. Three participants agreed and shared that materials costs are going up, creating a barrier for small and diverse businesses to operate and generate profit, as well as forcing them to potentially pass increased costs along to low-income households.

Everything is gutted out to the studs. So the cost of materials has truly affected everything. –Residential TA

Three focus group participants stated that they owned or worked directly with multi-user dwellings (MUDs). In the case of one MUD owner, the number of tenants not paying their rent has increased by 100%, having a direct impact on the TA's ability to finance their work. A fourth reported having a separate full-time job to make ends meet.

There was also a general consensus that access to capital is a primary concern. One focus group participant noted that they can only grow as fast as they have access to capital, and that the cost of materials has had a large impact on capital. Another participant stated that they are consistently fronting money to keep their business afloat.

2.1.3.1.4.5 Understanding the Local Labor Market

The consensus among focus group participants underscores the prevailing challenges within the current labor market. While there isn't necessarily a shortage of workers, the primary difficulty lies in identifying qualified and trustworthy trade allies willing to offer services at a fair price.

Participants highlighted the importance of cultivating a trusted network of partners for project collaborations. Two participants mentioned maintaining lists of preferred trade allies, ensuring continuity of work by promptly contacting alternative contractors if their initial choice is unavailable. However, concerns were raised regarding the rising prices of subcontractors and trades, posing financial constraints despite the desire for collaboration.

> *I'm not sure if it's difficult to find qualified people…I think there's a lot of trades out there that are ready to work, but pricing…stops them. –Residential TA*

The sentiment expressed by the other focus group participants was echoed by the group as a whole. Discussions also delved into the intricate relationship between quality and price concerning licensure. Some participants articulated a consideration of whether work could be completed without engaging a licensed contractor, reasoning that unlicensed individuals might forego certain overhead costs associated with running a business, such as workers' compensation or general liability insurance. However, not all participants subscribed to this perspective; some voiced concerns that opting for unlicensed subcontractors could potentially lead to higher costs if the subcontractor proves to be incompetent or lacking in skills. Additionally, one participant highlighted the issue of subcontractors being less than forthright about their licensure status, which could result in fines and other legal repercussions.

> *One of the guys came in and he said, yeah, yeah, I got the license. I'm going to get it to you. Well, two days after we wrap up, I was like, hey, where's the license? He didn't have the true license. –Residential TA*

The majority of businesses represented in the focus group were microbusinesses, each operated solely by its owner. However, one participant, representing the sole exception, disclosed having employees and elaborated on their investment in employee development, including compensating them for training and even facilitating out-of-state specialization courses.

Furthermore, a participant remarked on generational shifts in attitudes toward skilled trades, noting a perceived decline in technical aptitude and interest among younger individuals. This sentiment was encapsulated by the assertion that younger generations lack the inclination or proficiency in manual skills, with one participant succinctly remarking, "kids, they're not handy."

Since only one focus group participant has employees, additional research is needed to be able to draw conclusions about training needs in the market.

2.1.3.1.4.6 Feedback on Energy Smart Programs: Awareness, Barriers, and Benefits to Participation

The residential focus group participants universally lacked prior awareness of the portfolio of programs until introduced to them during the focus group session. One participant succinctly summarized the sentiment by stating, "the programs aren't advertised well."

Upon receiving a brief overview of the programs and their participation requirements, participants identified two primary barriers to engagement: insurance and licensure, and opportunity costs.

Insurance and licensure emerged as the foremost concerns among participants regarding program participation. All participants concurred that while obtaining a parish license is relatively easier and less expensive compared to a state license, the latter is mandated for offering certain services and is a prerequisite for enrollment as trade allies. Furthermore, state licensure necessitates workers' compensation insurance, or alternatively, contractors may opt to establish a single-member LLC and furnish an affidavit affirming their lack of employees, with subcontractors carrying their own insurance.

> *I've worked personally, so I don't have a way to prove that I've worked five years as an electrician. To get a contractor license, you have to get insurance for just yourself, state electrical contracting insurance [costs] $3,000 a month. You have to have an affidavit saying it's just you, you have to do a lot of stuff. Like I've passed the NEC code test. I proved that I'm a good electrician. Since I work with budget disadvantage, I usually take most of the hit myself. – Residential TA*

The second barrier discussed revolved around opportunity cost, with participants emphasizing the fundamental considerations of time and money in their decision-making process. One participant succinctly expressed being too preoccupied to engage with a $250 thermostat rebate, exemplifying the challenge of aligning incentives with the perceived value of participation. Another participant highlighted the lack of clarity regarding additional incentives beyond those publicly available, particularly noting the perceived inadequacy of incentives, especially for HVAC, as observed on the program website during the focus group session. These remarks imply that the existing portfolio incentives may not sufficiently incentivize trade allies to participate.

Furthermore, the focus group participants consistently reiterated their time constraints, emphasizing the monetary value of their time. The brief overview of the portfolio's incentive structure presented during the focus group session was met with skepticism.

Despite the aforementioned barriers, five out of seven focus group participants expressed interest in further exploration and potential participation in the programs. They identified potential benefits such as the opportunity to assist more individuals and the potential for financial viability and a steady income stream. However, two participants remained uncertain about the worthiness of participation, reiterating concerns about the allocation of money, time, and resources.

While awareness of the programs was low, six out of seven residential focus group participants disclosed already working with energy-efficient equipment, suggesting an existing alignment with program objectives among a significant portion of the target demographic.

> *I kind of think we're forced to at this point, like EPA regulations on HVAC equipment, minimum SEER ratings. So it's like we don't have a choice and it drives up the cost of everything, but that's the world we live in and I have mixed feelings about it. –Residential TA*

Another focus group participant mentioned that they thought the program sounded great, and another noted that while the programs aren't prevalent now, at some point soon they're going to become prevalent as energy efficiency continues to grow.

> *People are not aware of the [the program] right now, but I do believe that at some point it's going to become prevalent. If Entergy could promote that system and that service and also offset some of those costs, that would definitely help. –Residential TA*

During the focus group discussions, participants candidly shared various challenges they encountered with energy-efficient equipment, shedding light on practical issues that impact their everyday operations and decision-making processes:

- Use of apps for control: Some participants expressed frustration with the incorporation of mobile applications for controlling energy-efficient products, perceiving them as cumbersome or unnecessary. They indicated that the integration of such technology into their workflow may not align with their operational needs or may introduce complexity without significant added value.
- Installation complexities: Participants highlighted the challenges associated with installing energy-efficient equipment, describing the process as labor-intensive or technically demanding. Factors such as compatibility issues, unfamiliar installation procedures, or insufficient technical support were cited as contributing to the perceived difficulty.
- Product longevity: Concerns were raised regarding the durability and longevity of energy-efficient products. Participants reported instances where these products did not meet their expected lifespan or failed prematurely, leading to disruptions in service and additional maintenance costs.
- Availability of parts: Participants noted difficulties in sourcing replacement parts to maintain energy-efficient products. Limited availability or discontinued production of specific components can pose challenges in performing routine maintenance or repairs, potentially resulting in prolonged downtime or increased costs.
- Capital investment: Fronting the capital required for installing energy-efficient products emerged as a significant barrier for participants. The initial investment outlay for upgrading or retrofitting equipment to meet energy efficiency standards may strain financial resources, particularly for small businesses with limited access to capital or cash flow constraints.

Overall, these challenges underscore the multifaceted considerations and practical hurdles that trade allies encounter when engaging with energy-efficient equipment, highlighting the importance of addressing such concerns to facilitate broader adoption and participation in the programs.

2.1.3.1.4.7 Code Changes

In the context of Louisiana's evolving energy codes, perspectives among focus group participants exhibited a spectrum of attitudes and anticipations. Among the seven residential trade allies surveyed, two individuals specialized in energy codes and possessed awareness of recent changes, though they did not perceive immediate impacts on their businesses. However, they acknowledged the anticipated future ramifications of these changes.

Conversely, three participants expressed positive sentiments towards the updated codes. One participant foresaw the potential for the changes to generate additional revenue streams. Another emphasized the qualitative enhancements these changes would enable, particularly in averting issues such as moisture intrusion and mold growth, and rectifying deficiencies in existing infrastructure. Additionally, a third participant highlighted the potential benefits for customers in terms of reduced energy consumption and insurance costs, albeit acknowledging challenges in effectively communicating the upfront costs vis-à-vis long-term benefits.

Furthermore, one participant expressed keen interest in a new construction program, underscoring the importance of receiving training on effectively communicating emerging energy-efficient technologies and code changes to customers. Additionally, they emphasized the need for support in navigating the financial burdens associated with compliance, recognizing the complexities in balancing cost considerations while maintaining customer satisfaction.

These varied perspectives underscore the nuanced considerations surrounding the implementation of energy codes, highlighting both opportunities and challenges for stakeholders within the industry. Proactive engagement, education, and support mechanisms are crucial in facilitating adaptation and maximizing the benefits of regulatory changes.

> *The customer doesn't always understand everything you're telling them. They just want everything they put on that paper. And as long as you're clear and the codes are the codes, we have to abide by the codes when they changed. And so I always tell 'em my job is to make sure they get everything they want within their budget, and we are adjusting to what's coming up on the builder end before we get to the homeowner's end. –Residential TA*

2.1.3.1.4.8 Requested Support

Focus group participants shared various areas in which the programs could support them as trade allies (Table 2-18). Recommendations were related to engage in the programs and their services more broadly.

TABLE 2-18 RESIDENTIAL TRADE ALLY RECOMMENDATIONS

Support Recommendations	Description
Energy efficiency related	
Louisiana contractor license	Note having a license presents a significant barrier for small and diverse businesses.
Additional training opportunities	Specific interest in the programs helping to offset some of the costs for training on blower door testing and duct blasting.
Tax breaks, sponsorship programs, funding opportunities	Funding for equipment needed for energy efficient installations. Grants to help bring old buildings up to code.
Non-energy efficiency related	
Additional street lighting for safety	*[If] The programs [were] to do one thing for me, I would say to help my business add more streetlights. When you add more streetlights, there's more light at nighttime, which makes neighborhoods and areas safer. That's exactly what it needs because my business is all on location, location, location. If it's not a safe location, which is the number one factor of moving into any area, no one is going to want to be there.* –Residential TA
Access to capital	*It's really hard as a single person, especially working under your own LLC and not having to, if you're not paying yourself through that LLC constantly, and there is the issues, if you do, they can claim that you've made up hours.* –Residential TA

Assistance with unexpected costs	During the focus group discussions, two participants expressed apprehension regarding the potential for encountering significant and unforeseen expenses, particularly related to workers' compensation obligations and associated short payment terms. One participant shared a concerning example of being required to pay a substantial sum of $20,000 within a tight timeframe of 30 days following the filing of paperwork on revenue. This situation raised concerns among participants about the possibility of license suspension due to financial constraints. Furthermore, one focus group participant suggested the concept of the programs partnering with a green bank as a means of support for microbusinesses. This idea was proposed with the understanding that such a partnership could offer financial assistance and resources to alleviate the financial burden on small and diverse businesses. By collaborating with a green bank, the programs could potentially provide microbusinesses with access to funding, favorable loan terms, or other financial support mechanisms tailored to their unique needs and circumstances. These insights highlight the financial challenges and uncertainties faced by small and diverse businesses, underscoring the importance of exploring innovative solutions and partnerships to address these concerns. By proactively addressing issues related to workers' compensation and financial constraints, the programs can foster a more supportive and conducive environment for the participation and success of small businesses in their programs.

2.1.3.1.4.9 Findings and Recommendations

Findings and recommendations across the two focus groups are presented following the commercial focus group results in Section 2.1.3.2.3.8.

2.1.3.2 C&I Special Study Findings and Recommendations

2.1.3.2.1 *Cross Residential-Program Trade Ally Findings and Conclusions*

The evaluation yielded several key findings and conclusions, encapsulating insights from interviewed trade allies:

- Incentives and Rebates: Without exception, all interviewed trade allies unanimously acknowledged the efficacy of program incentives and rebates in facilitating cost savings for customers while fostering the adoption of energy-efficient practices. This recognition underscores the pivotal role played by financial incentives in incentivizing behavioral change towards greater energy efficiency.
- Opportunities for Business Growth: A notable observation emerged regarding the program's potential as a catalyst for business expansion. Four out of eight trade allies expressed optimism about leveraging their participation in the program to cultivate credibility and trust, thereby enhancing opportunities for business growth. By capitalizing on the strength and reputation of ENO, these trade allies envisage the potential to broaden their market reach and clientele base.

- Administrative Barriers: Despite the perceived benefits of program participation, trade allies identified administrative hurdles as significant barriers to engagement. Specifically, concerns were raised regarding the program's administrative processes, requirements, and procedures, which were perceived as cumbersome and time-consuming. Three out of eight trade allies highlighted the onerous documentation requirements and extensive paperwork associated with the application process, lamenting their restrictive impact on smaller companies lacking the requisite infrastructure to navigate such administrative demands effectively. This finding underscores the need for streamlining administrative procedures to enhance accessibility and inclusivity among all potential participants, regardless of size or organizational capacity.

2.1.3.2.2 *Cross Commercial-Program Trade Ally Focused Recommendations*

Following the comprehensive evaluation, the following key recommendations have been formulated to enhance the effectiveness and accessibility of the program:

- Reevaluate Program Incentives: There is a pressing need to reassess the efficacy of program incentives, as highlighted by feedback from trade allies. Many trade allies expressed dissatisfaction with the perceived benefits of the program's incentives, citing financial strain and inefficiencies in the payment process post-project completion. Addressing these concerns necessitates a thorough reevaluation of incentive structures to ensure they align with the needs and expectations of participating businesses, particularly smaller enterprises.
- Reassess Trade Ally Ranking System: The current trade ally ranking system, as noted by some interviewed trade allies, fails to accurately reflect the caliber of listed companies and lacks equity in representation. To foster a more level playing field and bolster transparency, it is imperative to reassess and potentially revise the existing ranking system, thereby ensuring fair and equitable recognition for all participating trade allies.
- Simplify Application Process: Streamlining the application process and minimizing paperwork emerged as a recurring theme among trade allies interviewed. Simplified procedures and reduced administrative burdens are essential in fostering greater participation and encouraging repeat engagement. Implementing measures to alleviate the time and resource constraints associated with paperwork would incentivize continued involvement from trade allies.
- Enhance Marketing Support: Providing comprehensive marketing support to trade allies is crucial in augmenting program visibility and credibility. Trade allies expressed a need for materials that not only bolster their credibility but also effectively communicate the benefits and offerings of the program to end customers.
- Facilitating co-branding opportunities and furnishing clear, user-friendly materials for dissemination would empower trade allies to effectively promote program participation and drive customer engagement.

By addressing these recommendations, the program can optimize its operational efficiency, enhance trade ally satisfaction, and ultimately achieve its overarching objectives of promoting energy efficiency and sustainability within the community.

2.1.3.2.3 *Commercial Non-Participant Trade Ally Focus Group*

The methods and research questions for the commercial non-participant trade ally focus group were the same as those used for the residential non-participant trade ally focus group outlined in Section 2.1.3.1.4.

2.1.3.2.3.1 Demographics

Focus group participants self-reported as sole proprietors, owners, or employees of, in most cases, small and diverse businesses (n=6). All focus group participants were program nonparticipants, meaning they had never engaged with the programs (**Error! Reference source not found.**).

TABLE 2-19 COMMERCIAL TRADE ALLIES (N=6)

Self-Reported Demographic	Respondents
Gender	2 female 4 male
Race	1 African American/Black 2 Hispanic/Latino 1 Mixed race 2 Caucasian/White
Sexuality	Not reported
Owner/Not owner	4 owner 2 not owner
Diversity certification/No diversity certification	3 certified, 3 not certified
HUBzone/Not HUBzone	Not reported
Specialization(s)*	3 general contractors 3 construction, renovations and whole house finishing 2 electricians 2 framing and sheetrock 2 demolition and post-construction cleanup 2 general facility maintenance 1 disaster cleanup, concrete finishing 1 property management 1 commercial service and supply 1 generators for extended outages 1 painting 1 roof repairs and replacements 1 mechanical contractor

*Focus group participants could specialize in more than one area

2.1.3.2.3.2 Customers

The commercial focus group participants detailed a diverse client base, reflecting the breadth of industries and sectors they serve.

These included:

- Businesses located in the New Orleans, Baton Rouge, and the Florida panhandle area,
- Large and small retailers,
- Banking institutions,
- Locally-owned restaurants,
- National service providers,
- Airports and railroads,
- Educational institutions such as schools,
- Government buildings and public facilities,
- Federal projects,
- Apartment complexes, and
- Housing developers.

Similar to the residential focus group participants, the commercial contractors reached a consensus regarding the effectiveness of advertising in acquiring customers. Instead, they emphasized the importance of referrals, word-of-mouth recommendations, and cultivating a positive reputation within the community as the most effective methods for both attracting and retaining customers.

Additionally, the commercial trade allies identified unconventional avenues for customer acquisition, including noticing facility issues while off-duty, wearing uniforms in public settings (e.g., during lunch breaks), and receiving referrals from apprenticeship students or previous clients. These insights underscore the significance of personal connections, proactive problem-solving, and community engagement in building and sustaining commercial trade ally businesses. By leveraging these strategies, trade allies can enhance their visibility, credibility, and client base within their respective markets.

> *We typically have a lot of repeat customers, and our customers recommend us to their friends. We don't advertise. –Commercial TA*

> *Sometimes [I'm] sitting at the bar … and I'm looking around, it's like, whoa. And the bartender says, 'What's going on?' That thing is about to fail. It's leaking water. 'Oh, you do that? Give me your number.' –Commercial TA*

2.1.3.2.3.3 Struggles and Pain Points

When asked about the challenges their businesses are facing, all the commercial focus group participants noted financial struggles related to customers not paying on time and extended payment terms, which results in cashflow issues for small businesses who then have to front money for materials and/or payroll.

You can finance a job; they'll give you all the work you can handle. You can get [payment terms] extended to 60, 90, [or] 120 days. For small contractors, that's a really big pill to swallow. –Commercial TA

Regarding payment terms and doing business only with clients who honor payment terms "we're playing hardball these days". – Commercial TA

[The] signatory agreement that we have [with the union], if they aren't paid, they can sit on the clock and you have you pay them time and a half until they get their pay or if you're not paying them, the union will pull your manpower and then you don't have the labor to fulfill your obligations. –Commercial TA

In addition to financial struggles, all focus group participants voiced significant concerns regarding material procurement and supply chain challenges. Participants reported encountering numerous issues related to materials, including difficulties in obtaining the correct materials for job completion, instances of materials arriving damaged or broken, and occurrences of companies intentionally delivering incorrect materials. Moreover, the lingering effects of the pandemic were highlighted as exacerbating these challenges, with supply chain disruptions causing delays and impacting project timelines. As a result, focus group participants expressed substantial financial losses attributable to these material-related issues.

Furthermore, obtaining permit inspections in a timely manner emerged as a notable challenge for some participants. Delays in permit inspections were described as having detrimental effects on business operations, particularly with regard to scheduling and subcontractor coordination. Participants expressed concerns over the potential repercussions of permit delays, including subcontractors passing on the costs of lost time or moving on to other jobs, leaving participants without the necessary labor to complete projects. Additionally, these permit-related delays were identified as negatively impacting business reputations, particularly for businesses reliant on word-of-mouth referrals and references. Participants emphasized the importance of timely permit approvals in maintaining positive reputations and avoiding perceptions of inefficiency or incompetence in project completion.

The steps [to go] through to get the permits from not only the permit office, but if you work on a job and you need power or whatever you need, there's so many steps to go through to get this. That's one permit, probably [sitting] on the desk, this electric permit, probably [sitting] for a month and to keep going back and going back and Entergy would not turn on the power until that permit is released…. Now I have to spend money on gas to get their generator and get to work. –Commercial TA

While certain challenges were commonly discussed among focus group participants, there were also additional struggles mentioned by one or two participants that did not elicit the same level of consensus within the group. These included:

- Discovery of infestations and similar problems after a budget has been finalized: Some participants highlighted the challenge of encountering unexpected issues, such as infestations or structural problems, after project budgets had already been finalized. These unforeseen complications can disrupt project timelines and budgets, leading to additional expenses and logistical complications.
- Challenges with finding and conducting business as an individual whose native language is not English: Participants discussed the difficulties faced by individuals whose primary language is not English in navigating the business landscape. Language barriers can present obstacles in communication with clients, subcontractors, and regulatory authorities, potentially affecting project execution and business operations.
- Difficulties competing with large primes and bidding against them or subcontracting with them as a small startup: Some participants expressed concerns about the competitive landscape, particularly the challenges of competing with larger prime contractors in bidding processes or securing subcontracting opportunities. Small startups may encounter difficulties in establishing themselves and gaining traction in markets dominated by larger players.
- Learning curve associated with online presence and advertising: Participants noted the learning curve associated with establishing and maintaining an online presence and effectively utilizing digital marketing strategies. Navigating online platforms, managing social media accounts, and optimizing advertising efforts can pose challenges for businesses seeking to enhance their visibility and attract customers in an increasingly digital marketplace.

While these struggles were not universally experienced among all focus group participants, they nonetheless represent significant challenges that some individuals face in the contracting business. Addressing these issues may require tailored support and resources to assist affected individuals in overcoming barriers and achieving success in their business endeavors.

2.1.3.2.3.4 Understanding the Local Labor Market

Unlike the residential focus group participants, who felt there isn't necessarily a shortage of workers, the commercial focus group participants had found a consistent lack of willingness to work, especially among youth. Amongst those who are willing to work, focus group participants found workers to be lazy, approaching their

work in a chaotic and unsystematic way. This leads to loss of profit for business owners and dangerous conditions on the job site.

There was a consensus that finding employees who are willing to work and understand the jobs is challenging.

> *We'll try to hire these younger kids and they just, man, they constantly want breaks. I've had these 20-year-old boys [say] man, this is heavy. I just went and grabbed it and I was like, well then you can nail it. Holding it up. I was mad. –Commercial TA*

Three focus group participants expressed willingness to train people but commented that: "there's so many people that really, they just don't really want to work."

A discussion also emerged about the pros and cons of working with the union during the focus group, highlighting the different perspectives of a business owner and a union employee.

> *[When you] contract with the union [you] mostly get your help through the…people coming in through the apprenticeship who have gotten at least some training and who are there and willing to learn. I mean, when you sign up, you sign up for at least 10 years. –* Commercial TA

> *You get the labor that's coming out of the [academy], but they pay prevailing wage scales, but the quality of work in return is not the same. …. The way they went at their work was very chaotic and unsystematic and lazy. –*Commercial TA

This interaction sparked dialogue between other focus group participants. A third focus group participant noted the dangers of working with inexperienced contractors and apprentices, in that if these individuals do not slowdown in how they approach a task, they can put each other in danger. A fourth focus group participant stated that young people do not seem to think about their work before they do it. Another focus group participant indicated they normally work alone to avoid potential mistakes and need to redo work.

2.1.3.2.3.5 Feedback on Entergy New Orleans Programs: Awareness, Barriers, and Benefits to Participation

Of the six focus group participants, two had heard of the programs and one of those had tried participating in the programs in the past. The one focus group participant who had heard of the programs explained they had heard of the programs but did not have any details. Moreover, other focus group participants indicated that they have never seen program representation at contractor fairs such as the urban league and small business associations.

The one near-participant explained they enrolled as a trade ally but never completed a project. This person shared that they thought the program did not make it clear what opportunities are available and how much "red tape" is involved in participating. They discussed the challenges they experienced in having to go out and bid on

opportunities and noted that if the program could negotiate opportunities or put contractors in a rotation for work, that would be more proven for small businesses.

> They don't give opportunities to small business. They have a stack of paper about this statement and once you've completed that packet of information, the hurdles that you have to jump through to get opportunities, they still don't make them readily available. […] it cost money to bid. – Commercial TA

When a brief overview of the program and participation requirements was provided by evaluators, focus group participants mainly noted opportunity cost as the main barrier to participating in the program, since participation needs to be worth their time. As the commercial incentives are a little more complicated and can include custom incentives, the commercial focus group participants were not able to provide direct feedback on incentive levels.

Unlike in the residential focus group, licensing as a barrier to participation did not come up organically in this focus group. When evaluators asked focus group participants if the state license requirement was a barrier, the feedback was mixed. One focus group participant agreed that getting the contractor license is a barrier. Other focus group participants generally agreed that getting the contractor license is difficult, but not necessarily a barrier to participating in the program.

All focus group participants were interested in learning more about programs and potentially participating. They agreed that the main benefits of participating in the program would be having a different stream of customers available to them and that having relationships with ENO would be beneficial. It should be noted, however, that focus group participants were talking about these benefits from the point of view of ENO bringing them new work, as opposed to the trade allies being responsible for finding their own work and putting it through the program.

> *Having that relationship with an entity that speaks volume to me. I'd like to have anyone tracked to know that you sign up, you participate, you get opportunities. –Commercial TA*

While most (six of seven) of the residential focus group participants reported already working with energy efficient equipment, the feedback from the commercial focus group participants was mixed. One focus group participant said they focus on energy efficient equipment, while others discussed that they are just starting to have some customers move towards efficient equipment. They felt installing and maintaining energy efficient products is more expensive, affecting the bottom line. Overall, the discussion indicated that equipment these contractors install veer towards standard efficiency.

Similar to the residential focus group, commercial focus group participants noted difficulties maintaining energy efficient equipment, saying they have to “scramble” to the equipment when it breaks or requires maintenance.

2.1.3.2.3.6 Code Changes

Regarding changes to the code, responses among focus group participants were neutral to positive and, for the most part, not impacting businesses at present for the commercial focus group. One focus group participant remarked that they don't have a code for the work they perform. Another stated that the code is already in force in the permitting process.

A third focus group participant remarked that their spouse mainly deals with codes and tells everyone on the team exactly what has to be done, so they were unable to answer the question. A fourth focus group participant stated that they were aware code changes were coming but knew nothing about them. A fifth one made a positive remark about these changes in general, especially in that they drive down prices.

> THERE ARE SOME PRODUCTS OUT THERE THAT PEOPLE ARE DEVELOPING. IF YOU SAY THAT'S ONE GOOD THING ABOUT TECHNOLOGY, IT TENDS TO IMPROVE THE ENERGY EFFICIENCY. SOMETIMES IT ACTUALLY BRINGS THE PRICE DOWN. SO I'M AWARE OF SOME BUILDING PRODUCTS AND IT'S NOT EVEN IN THAT INDUSTRY ARE HEMP BUILDING BLOCKS THAT PEOPLE ARE USING…AND THEY'RE REALLY, IT'S JUST A GREAT PRODUCT. –COMMERCIAL TA

2.1.3.2.3.7 Requested Support Commercial Trade Allies

Focus group participants shared various areas in which ENO could support them as trade allies, though each focus group participant had slightly different ideas (Table 2-20). Some of the support trade allies discussed could potentially be supported by ENO, while other support is outside of their purview.

TABLE 2-20: COMMERCIAL TRADE ALLY RECOMMENDATIONS

Support Recommendations	Description
Small business hotline	Make programs more accessible - "*some kind of shortcut through all the bureaucracy*" - especially in getting in and out with permits.
Mentorship program	Transitioning from residential to commercial work has a learning curve.
Trade ally networking	Helping small and diverse businesses establish relationships with larger, primary contractor. It can be hard to compete, partner, or subcontract with larger contractors. Participants noted they often feel "invisible" to the program and larger contractors.
Reduce response time	Shortening how long it takes the programs to conduct a site visit and address an issue. One participant noted *"[Entergy] came out, supposedly turn on the power or to unlock the locks. They had a faulty lock or…had a problem with it. It took them two weeks to come back out. That's killing my job."*
Access to capital	Reduce burden of upfront costs

2.1.3.2.3.8 Findings and Recommendations

The following represents findings and recommendations across the two focus groups: residential and commercial.

Analysis of focus group discussions indicates the presence of a diverse array of trades within the marketplace, suggesting potential untapped resources for program participation. However, low awareness levels among focus group participants present a significant barrier to engagement. Moreover, recurring sentiments regarding the value of time underscore the paramount importance of ensuring that program offerings sufficiently align with the needs and priorities of prospective participants.

The current program design may face challenges in delivering perceived value significant enough to incentivize participation, particularly as participants expressed aspirations for the program to serve as a conduit for new opportunities and client acquisition. While clarity regarding program benefits remained a point of contention, the majority of focus group participants exhibited an interest in further exploration and potential involvement, underscoring an opportunity for targeted outreach efforts and program refinement to better cater to their needs and expectations.

1) Financial Concerns. The operational challenges faced by small and diverse contractors, including cash flow constraints stemming from extended payment terms, customer delinquencies, escalating material costs, and the financial burdens associated with insurance, bonding, and licensure, collectively erode profit margins and escalate overall costs. Against this backdrop, engaging in activities such as participation in energy efficiency programs often assumes a secondary priority in their operational exigencies. The willingness of these contractors to participate in such programs is intricately tied to the extent to which supportive mechanisms, whether through the programs themselves or other external entities, can address their financial constraints. Access to capital, incentives for trade allies, or alternative forms of compensation for their time and expertise emerge as pivotal factors shaping their participation decisions.
2) Low program awareness. "Of the 13 focus group participants surveyed, only two had prior awareness of the programs, both of whom represented commercial contracting entities. Interestingly, one participant had only a vague familiarity with the program, while the other, classified as a near-participant, had enrolled in the program but had not progressed to completing a project. Moreover, participants conveyed a notable absence of program representation at industry events, indicating a potential gap in outreach efforts within the contractor community.
3) Opportunity costs. The perceived benefits of program participation failed to resonate as significant motivators for the small business owners engaged in the focus groups, largely due to the primacy of time and financial considerations in their decision-making processes. Discussions revealed a reluctance to contend with bureaucratic hurdles, paperwork, and administrative complexities, as their operational demands left little room for additional administrative burdens. During the focus groups, participants expressed surprise upon discovering that the incentives listed on the program website were not direct compensation to them but rather passed through to the customer. Notably, all participants emphasized a reliance on referrals for both lead generation and customer retention, eschewing traditional advertising methods. Given these insights, further research is imperative to ascertain the requisite benefits necessary to incentivize currently disengaged trade allies to actively participate in the programs, thereby fostering a more comprehensive understanding of their needs and preferences.

4) State license requirements. A consensus emerged among residential trade allies regarding the substantial obstacle posed by the state license requirement. Participants in the residential focus groups conveyed that obtaining the state license entails significant costs and presents challenges in demonstrating requisite experience, particularly for LLCs operating within the residential sector. Conversely, licensure was perceived as less burdensome by commercial focus group participants, albeit still costly. Notably, participants across both segments acknowledged the New Orleans parish license as a comparatively more accessible and cost-effective alternative to the state license.
5) Available workforce. Feedback regarding the state of the workforce was inconsistent. Residential focus group participants did not express a shortage of workers, while commercial focus group participants struggled to find good employees. The key difference between the groups was the residential focus group participants were talking about there being enough other contractors for them to partner with in other specialties, whereas the commercial focus group participants were talking about hiring direct employees. As such, the commercial focus group participants thought having access to additional training and mentorship opportunities would be helpful, though they already offer training to their employees.
6) Energy code Many of the focus group participants do not deal with the energy code. Of those who do, the new code changes did not seem to present a problem at present, though none have worked on a project where there was an impact from new code.

Based on the focus group discussions, evaluators have several recommendations.

1) Increase presence at industry events. To enhance outreach efforts targeting small and diverse businesses, it is recommended that the programs augment their presence at industry events and contractor fairs, including those organized by entities such as the Urban League, City of New Orleans, and the Small Business Association. As familiarity with the programs among small and diverse contractors grows, a proactive approach to conducting near-participant research with interested or enrolled contractors who have not yet submitted projects is advised. This research aims to gain insights into their experiences and identify any barriers they may face. Moreover, the programs should deliberate on the efficacy of their outreach strategies and ensure inclusivity in engaging with new contractors. Notably, the residential focus group participants were exclusively comprised of individuals already utilizing efficient equipment. Consequently, program design should contemplate the potential implications for free-ridership.
2) Consider restructuring the program to directly provide jobs to smaller and more underrepresented trade allies. In the focus group discussions, participants expressed a desire for compensation for their time investment and harbored expectations that engagement in the program would yield new business opportunities and a consistent revenue stream, obviating the need for competitive bidding or self-sourcing projects. These enterprises typically lack the bandwidth and resources to pursue new contracts within the framework prescribed by the current program structure, instead relying heavily on organic growth driven by word-of-mouth referrals and established reputations.

Given these insights, it is prudent to reassess the underlying program theory to explore potential alternative avenues or supportive measures that could alleviate the participation barriers encountered by small and diverse contractors, thereby facilitating the attainment of the program's objectives.

3) Revisit current incentive levels. The focus group participants expressed dissatisfaction with the incentive levels outlined on the program website, particularly highlighting concerns regarding the perceived inadequacy of incentives for HVAC-related projects. Against the backdrop of inflationary pressures and escalating material costs, it is advisable for the program to conduct a comprehensive review of incentive structures vis-à-vis the prevailing cost of living and materials.

   This assessment should aim to ensure that incentive levels remain commensurate with the economic realities faced by contractors and customers. Furthermore, the programs could benefit from benchmarking exercises against analogous utility initiatives to ascertain any notable differentials or deficiencies in incentive offerings. Additionally, exploring the feasibility of implementing alternative incentive tiers tailored specifically for low-income households could foster greater inclusivity and alignment with equitable access objectives.

4) Investigate alternative licensure requirements. Acquiring the Louisiana state contractor license represents a substantial hurdle for small and diverse businesses, particularly those catering to residential clientele. In light of this challenge, the program should explore the viability of recognizing the New Orleans parish license as a suitable alternative. This pragmatic approach could help mitigate barriers to entry and promote greater participation among small and diverse contractors, thereby fostering a more inclusive and robust marketplace for energy efficiency initiatives within the region.

5) Explore opportunities for additional support and funding for small businesses. The programs ought to deliberate on the auxiliary support mechanisms highlighted by focus group participants and explore potential partnerships with agencies capable of providing such services. Notably, cash flow management and access to capital emerged as prominent challenges among focus group participants. To address this, there is merit in considering collaborations with entities like green banks or local small business associations to extend benefits such as low- or no-interest loans to small and diverse businesses engaging in the programs. Such strategic partnerships can not only alleviate financial constraints but also enhance the overall attractiveness of program participation, thereby fostering greater inclusivity and efficacy in advancing the program objectives.

2.1.3.3 HPwES Findings and Recommendations

Findings and Conclusions:

- Effective Communication Channels: The evaluation found that email communication from the program was the most effective means of informing customers about the program. This underscores the importance of targeted email campaigns in reaching and engaging potential participants.
- Motivation for Participation: The primary motivation for customers to participate in the program was the potential to save money on their energy bills. This highlights the significance of cost savings as a key driver for customer engagement in energy efficiency programs.

- Impact of Major Measure Improvements: Major measure improvements, such as air and duct sealing, were identified as having a significant impact. Customers who received these improvements stated that they would not have undertaken them without the incentives and assistance provided by the program.

Recommendations:

- Email Communication: Given the effectiveness of email communication, it is recommended to continue prioritizing this channel to attract customers to the program. Consistent and targeted email campaigns can maximize program visibility and participation.
- Comprehensive Program Details: Providing accurate and comprehensive program details to customers is essential. This includes actionable steps to realize energy bill savings and tips and assistance related to achieving these savings. Clear and detailed information will enhance customer understanding and engagement with the program.

2.1.3.4 IQW Findings and Recommendations

Findings and Conclusions:

- Motivation for Participation: The evaluation revealed that the primary reason for customer participation in the IQW program is to save money on energy bills. However, satisfaction with monthly utility bill savings is below expectations for fewer than half of respondents.
- Effectiveness of Direct Installation Measures: While most direct installation measures are effective, there are instances where they do not function properly or are not needed or understood by the customer.

Recommendations:

- Implement HPwES Recommendations: Considering the similarities in design and issues between the HPwES and IQW programs, it is recommended to explore opportunities to implement recommendations from the HPwES program evaluation. This could include developing a customer journey map and ensuring prompt customer follow-up to enhance program effectiveness.

2.1.3.5 RLA Findings and Recommendations

Findings and Conclusions:

- Awareness of the Program: Most respondents learned about the program directly from the program, primarily through email communication or the program's website. However, satisfaction with the rebate process is lower due to issues with wait times and application procedures.
- Influence of the Program: The program significantly influences customers' energy efficiency behaviors and purchases, with two-thirds of respondents reporting making purchases or upgrades to their homes to reduce energy usage.

Recommendations:

- Online Advertising: Given the effectiveness of online methods such as email and website banners, it is recommended to focus advertising efforts on these channels to maximize program visibility.

- Streamline Rebate Process: Streamlining the rebate application process to improve customer experience is crucial. Additionally, providing enhanced customer service representative training will ensure better program understanding and support for participants.

2.1.3.6 MF Solutions Findings and Recommendations

Findings and Conclusions:

- Effectiveness of Program: Trade allies commend the effectiveness of the program in addressing issues in low-income areas, particularly in improving duct systems and enhancing air conditioning performance.
- Barriers to Engagement: However, property manager indifference and difficulty in gaining access to properties pose significant barriers to program engagement for trade allies.

Recommendations:

- Support for Trade Allies: Providing additional support and guidance for trade allies, including clearer communication about customer assignments and regular check-ins with dedicated program representatives, can enhance program engagement.
- Educational Materials for Customers: Developing educational materials for customers on key services will enhance understanding and engagement with the program. Decreasing turnaround time between job requests and assignments is also recommended to increase overall productivity.

2.1.3.7 A/C Solutions Findings and Recommendations

Findings and Conclusions:

- Program Improvements: Trade allies appreciate the continuous improvements in the program, particularly in streamlining work assignments and handling referrals.
- Challenges Faced: However, trade allies express dissatisfaction with inconsistent payment processing times and difficulties in project execution due to duplicate assignments and customer expectations.

Recommendations:

- Communication with Trade Allies: Increasing communication with trade allies to ensure clarity on payment schedules and project expectations is essential for program success.
- Enhanced Marketing Efforts: Providing tangible resources for credibility and collaborative marketing efforts to raise awareness and promote program participation will further enhance program effectiveness.

2.1.3.8 SK&E Findings and Recommendations

There were no findings for the SK&E program.

Recommendations:

- Consider adding Advanced Power Strips to kit offering. It may be worthwhile to include APS units in the kit offering to either supplement the current kit or to replace the LED lamps as EISA policy impacts are further realized after the July 1st, 2023 enforcement. The Evaluators have seen successful measure implementation in similar programs.

2.1.3.9 AR&R Findings and Recommendations

There were no findings or recommendations for the AR&R program.

2.1.3.10 Behavioral Findings and Recommendations

Findings are as follows:

- Estimated Behavioral Program Savings: The Evaluators conducted billing analysis of cohorts to estimate Behavioral Program savings for Entergy. In the 2023 calendar year evaluation, statistically significant annual savings were found for three out of six cohorts. The verified program savings for PY13 amounted to 6,466,294 kWh and verified demand reductions of 1,091.12 kW.
- Regression Analysis Results: Unadjusted program savings for PY13 totaled 6,529,470 kWh. Downstream double counted savings were estimated at 63,176 kWh for PY13. After removing these double counted savings from the regression results, the total verified, adjusted program savings amounted to 6,466,294 kWh.
- Comparison of Household Annual Savings: The Neighbor Compare – New, Neighbor Compare – Original, and Self Compare – Original groups demonstrated average household annual savings of 0.97%, 1.91%, and 2.47%, respectively. Notably, the Neighbor Compare – Original and Self Compare – Original groups effectively doubled their annual household energy savings between PY12 and PY13. However, three cohorts in the program did not exhibit statistically significant savings, resulting in lower than typical behavioral program savings.
- Factors Contributing to Deflated Savings: Deflated savings were observed due to changes in implementation, including the treatment of 75% of the control group and data disruptions in customer emails, which hindered implementors from sending reports to many customers. These disruptions potentially decreased the treatment effect during the 2023 evaluation year.
- Challenges in Estimating Savings for Certain Cohorts: The Evaluators were unable to estimate savings for the Neighbor Compare – ADM, Neighbor Compare – Original, and Self Compare – New cohorts. Although ad-hoc counterfactual groups passed validity testing, regression results showed zero or negative average household savings, indicating inherent differences between treatment and control groups. The Evaluators recommend future cohorts align with RCT designs and are randomly selected by a third-party evaluator.
- Atypical Results for PY13: The PY13 results are deemed atypical due to disruption of randomized control trial cohort assignment and reduced mailed and emailed reports to customers because of data disruptions. For future program years and planning, annual household savings in the range of 0.5% to 2.5% are anticipated to better align with typical year savings.
- Transition to Aggregate Behavioral Cohort with RCT Design: In December 2023, program implementers designed an aggregate behavioral cohort with an RCT design, validated by the evaluation team. Consequently, the Evaluators plan to evaluate the program without quasi-experimental evaluation techniques in PY14, aiming for more accurate and defensible savings in the future.

Recommendations are as follows:

- Halting Treatment of Control Group Customers: The Evaluators suggest that implementors maintain the practice of ceasing treatment of all control group customers. This approach facilitates the utilization of Randomized Controlled Trial (RCT) designs established at the program's outset. These designs, aligned with the NREL Behavioral Protocol, enable the Evaluators to estimate verified savings accurately.

- Consulting Third-Party Evaluators for Cohort Selection: It is recommended that implementors continue to seek guidance from third-party evaluators when selecting future cohorts. Moreover, the Evaluators advocate for aligning all future cohorts with the NREL Behavioral Protocol RCT experimental design. Each cohort should ideally comprise a minimum of 25,000 treatment customers to ensure detectable treatment effects. This approach minimizes the need for propensity score matching and ensures equivalence between treatment and control groups, facilitating accurate measurement of treatment effects during the post-period.
- Consulting Third-Party Evaluators for Program Changes: The Evaluators advise implementors to consult third-party evaluators before implementing any alterations to program or messaging design or frequency. This consultation process ensures that modifications in program design do not significantly impact expected program savings, maintaining program effectiveness and integrity

2.1.3.11 EasyCool BYOT Findings and Recommendations

The following summarizes the key findings and conclusions from the PY13 evaluation.

- Attainment of Demand Reduction Target: The program successfully achieved 41% of its *ex post* gross demand reduction target, indicating significant progress towards its overarching goal of reducing demand on the grid. This achievement underscores the effectiveness of the program's strategies and initiatives in incentivizing energy conservation and efficiency among participants.
- Increase in Program Participation: The addition of 2,000 new participants in PY13 reflects a notable 156% increase in program participation compared to previous years. This surge in participation demonstrates growing awareness and interest among consumers in engaging with energy efficiency programs, highlighting the program's success in expanding its reach and impact.
- Consistency in Opt-Out Rates: Despite program expansion, opt-out rates for Demand Response (DR) events remained consistent with historical trends, ranging from 20% to 30%. This stability suggests that the program has maintained effective communication and engagement strategies to retain participants while providing them with flexibility in their involvement in DR events.
- AMI Data and Participant Tracking: Approximately 15% of BYOT participants were identified as lacking Advanced Metering Infrastructure (AMI) data, indicating potential discrepancies in participant tracking and data management. The evaluation highlights the importance of ensuring comprehensive data collection and tracking mechanisms to accurately assess program performance and participant engagement.
- Cross Participation and Savings Adjustments: A notable proportion (11%) of BYOT participants exhibited cross participation with the Peak Time Rebate (PTR) program, necessitating adjustments in savings calculations to account for overlapping participation and avoid double-counting of energy savings. This recommendation underscores the importance of refining evaluation methodologies to accurately quantify program impacts in the presence of participant overlap.
- Program Awareness via Online Platforms: The Energy Smart website emerged as a prominent channel for program awareness, with 45% of survey respondents citing it as their source of program information. This finding emphasizes the critical role of online platforms in disseminating program information and engaging with target audiences effectively.

- Opt-Out Dissatisfaction and Communication: Dissatisfaction with event notifications and durations was observed among opt-out respondents, indicating potential areas for improvement in communication strategies and event planning. Addressing these concerns can enhance participant satisfaction and retention, ultimately bolstering program effectiveness.
- Motivations for Enrollment: Financial incentives emerged as the primary motivator for program enrollment, with a significant majority of respondents driven by the prospect of cost savings or incentives. This insight underscores the importance of designing incentive structures that resonate with consumer preferences and priorities to encourage program participation.
- Preference for Text Message Notifications: Survey respondents expressed a preference for text message notifications over other communication modalities, highlighting the importance of leveraging mobile technology to deliver timely and relevant program updates and alerts. Embracing text-based communication can enhance participant engagement and responsiveness.
- Common Complaints and Areas for Improvement: Dissatisfaction with various aspects of the program, including high bills, inadequate event notifications, and dissatisfaction with the service provider, underscores the need for continuous improvement and refinement in program design and implementation. Addressing these common complaints can enhance overall participant satisfaction and program effectiveness.

The Evaluators have the following recommendations after completing the PY13 evaluation.

- Alignment of Demand Response Event Times: It is recommended to synchronize the start and end times of demand response events for customers with cross participation in multiple programs. This alignment ensures consistency in measuring savings impacts across programs and minimizes distortions in baseline models caused by overlapping event schedules.
- Commencement of Events on the Hour: When hourly interval Advanced Metering Infrastructure (AMI) data is available, demand response events should commence and conclude on the hour. This practice ensures precise measurement of energy reductions by aligning event durations with the hourly intervals captured in the data, facilitating accurate assessment of program effectiveness.
- Aggregation of Interval AMI Data: Interval AMI data should be aggregated to the hourly level based on the hour-ending datetime. By adhering to this aggregation method, program administrators can maintain accuracy in usage measurement, avoiding inconsistencies or errors associated with aggregating data across multiple hours.
- Monitoring of Event Frequency: Implementers of demand response programs with cross participants should monitor the frequency of events called across all programs within a sector, particularly residential programs. This monitoring helps preserve the availability of proxy days used for testing baseline models, ensuring robust evaluation methodologies and accurate assessment of program impacts.
- Consideration of Event Scheduling: To mitigate potential reductions in available proxy days due to excessive event scheduling, it is advisable to consider calling events for residential demand response programs on the same dates. By aligning event schedules, program administrators can optimize the use of proxy days and maintain the integrity of baseline models, facilitating comprehensive program evaluation and analysis.

2.1.3.12 PTR Pilot Findings and Recommendations

The following summarizes the key findings and conclusions from the PY13 evaluation.

- Achievement of Demand Reduction Target: The program achieved 28% of its *ex post* demand reduction target in PY13. This indicates the program's effectiveness in reducing peak electricity demand during targeted periods, albeit below the set target.
- Program Subscription: The program was fully subscribed in PY13, signifying strong interest and participation from eligible customers. Full subscription indicates that the program reached its intended capacity for participant enrollment.
- Incentive Payments and Baseline Models: A significant proportion (25%) of participants showing curtailment with ex post baselines did not receive incentive payments due to ex ante baseline models being too low. This discrepancy highlights challenges in accurately predicting energy savings using baseline models. Moreover, the comparison between ex ante and ex post saver types revealed variations, with some instances showing divergent classifications between the two evaluation approaches.

The Evaluators have the following recommendations after completing the PY13 evaluation.

- Alignment of Demand Response Event Times: It is recommended to synchronize the start and end times of demand response events for customers participating in multiple programs (e.g., BYOT and PTR). Misalignment of event times can distort the accuracy of savings measurements, particularly impacting baseline models. For instance, if events in one program begin prior to events in another program, it can push the offset adjustment hour further from the event time, complicating measurements of interactive effects from cross participation. Additionally, discrepancies in event end times across programs can impede the measurement of savings during overlapping periods.
- Standardization of Event Timing: Demand response events should ideally commence and conclude on the hour, especially when hourly interval AMI data is available. If events are called on the half hour, 30-minute interval data should be provided to ensure precise measurement of reductions. This standardization facilitates the comprehensive utilization of event durations for accurately assessing energy savings.
- Aggregation of Interval AMI Data: Interval AMI data should be aggregated to the hourly level based on the hour-ending datetime, without spanning across multiple hours. For instance, usage data with a datetime ending at 4 PM should represent usage from 3 PM to 4 PM. This ensures consistency and accuracy in usage measurement, enhancing the reliability of baseline models and savings estimation.
- Consideration of DR Event Frequency: Implementers of demand response programs with cross participants should monitor the frequency of demand response events across all programs within a sector (e.g., residential DR programs). Excessive event scheduling can reduce the availability of proxy days for testing baseline models, impacting the accuracy of savings estimation. To mitigate this issue, events for residential DR programs should be scheduled on the same dates to optimize the use of proxy days.
- Utilization of MISO WSA Baseline Model: It is recommended to utilize the MISO WSA baseline model for estimating energy savings and defining saver types. This model helps avoid underestimating program

impacts by providing robust estimates of energy savings for customers. Leveraging this baseline model enhances the accuracy of savings calculations and ensures a comprehensive evaluation of program effectiveness.

2.1.3.13 BESS Pilot Findings and Recommendations

The following summarizes the key findings and conclusions from the PY13 evaluation.

- Utilization of Interval AMI Data: The Evaluators successfully leveraged interval AMI data for evaluating program impacts. This data encompassed all battery discharge and charging kWh amounts, as well as any imported or exported kWh quantities. This comprehensive dataset provided a robust foundation for assessing the effectiveness of demand response events.
- Peak Demand Reduction Estimation Methodologies: Two methodologies were employed by the Evaluators to estimate peak demand reductions, both yielding similar estimates. Evaluation Method 1, which examines changes in net kW, incorporates any behavioral changes in customer usage resulting from demand response events. On the other hand, evaluation Method 2 focuses solely on the net change of battery discharge. The convergence of estimates from both methods suggests that demand response events did not significantly influence customer behaviors.
- Battery Charging Post-Event: Following demand response events, batteries were promptly charged. This immediate charging ensures the restoration of battery reserves to support subsequent demand response activations and maintain grid stability.
- Routine Battery Discharge: Seven out of 17 participants discharged their batteries outside of demand response events. Therefore, any baseline established must appropriately factor in routine battery discharge. Both EM&V methodologies account for this routine discharge, ensuring accurate assessment of demand response impacts.
- Issue with First Demand Response Event: The first demand response event encountered an issue related to a Storm Guard setting, preventing the participation of six customers. Subsequent events did not experience any issues affecting customer participation. It's important to note that failed curtailment signals, such as the incident with the Storm Guard setting, can undermine the performance of demand response programs and potentially impact program impact calculations in future years.

The Evaluators have the following recommendations after completing the PY13 evaluation.

- Enhancing Data Collection with Enphase: The Evaluators propose collaborating with Enphase to acquire comprehensive telemetry data for EM&V purposes. This initiative aims to address potential limitations arising from the absence of interval AMI data containing essential information such as import and export kWh values. By leveraging Enphase's capabilities, including telemetry data, a more holistic understanding of peak demand impacts can be attained. This proactive approach ensures the availability of robust data sets necessary for accurately assessing demand response program effectiveness across a broader spectrum of events and participants.

2.1.3.14 EV Charging Pilot Findings and Recommendations

The following summarizes the key findings from the PY13 evaluation.

- Performance of EV Pilot: The EV Pilot attained 9% of its ex-post demand reduction (kW) target.

- Creation of Matched Control Group: The Evaluators successfully established a matched control group for the baseline counterfactual, enhancing the accuracy of the evaluation.
- Statistically Significant Peak kW Reductions: The EV Pilot demonstrated statistically significant peak kW reductions, achieving an average reduction of 0.53 kW per participant.
- Target Achievement Projection: To meet the demand reduction target of 530 kW, the program aims to enroll nearly 1,000 customers by the third year of the pilot. This projection underscores the necessity of scaling up customer enrollment to achieve program objectives.

The Evaluators have the following recommendations after completing the PY13 evaluation.

- Hourly Aggregation of Interval AMI Data: Interval AMI data should undergo aggregation to hourly intervals based on the hour ending datetime. It is imperative that usage is not aggregated across more than one hour. For instance, data ending at 4 PM should exclusively represent usage from 3 PM to 4 PM, ensuring accurate measurement and analysis.
- Procurement of Potential Control Customers: For future program years, the procurement of potential control customers should follow the same methodology utilized in 2023. This includes sourcing control customers from various channels such as Sagewell's EV Finder algorithm, individuals who enrolled after the program year commenced, and participants who initiated but did not complete the enrollment process. This approach ensures consistency and reliability in selecting control groups for evaluation purposes.

2.1.3.15 Large C&I DR Findings and Recommendations

The following summarizes the key findings and conclusions from the PY13 evaluation.

- Utilization of Hourly Interval AMI Data: Throughout PY13, the evaluation capitalized on hourly interval AMI data across all sites, ensuring comprehensive data coverage for robust analysis and evaluation.
- Enrollment Goals and Performance: Despite Honeywell's failure to meet enrollment targets for the program in PY13, there has been a consistent increase in the achieved percentage of targets over the years. Notably, the program attained 32% of its kW target in PY13, a substantial improvement from previous years, with a notable increase to 43% in PY13. This upturn in kW savings can be attributed to the incorporation of seven new sites during the evaluation period.
- Recruitment Strategies: Program recruitment primarily relies on word-of-mouth referrals, underscoring the significance of personal recommendations and positive experiences in driving participation. Additionally, program marketing initiatives encompass a range of strategies, including the distribution of informative handouts, dissemination of program details through the official website, hosting of educational sessions such as lunch-n-learns, and active participation in industry presentations. Staff members acknowledge the paramount role played by word of mouth in recruitment efforts, highlighting its effectiveness in fostering program engagement and participation within the target audience.

The following summarizes key recommendations after completing the PY13 evaluation.

- Strengthen Collaborative Partnerships: It is recommended that the program continues to foster relationships with other C&I programs. Leveraging partnerships with other C&I initiatives can serve as an effective strategy for identifying and recruiting potential customers interested in participating in the

demand response program. Collaborative efforts can enhance outreach and engagement efforts, ultimately expanding the program's reach and impact within the C&I sector.

- Conduct Educational Workshops: Consider organizing educational workshops focused on demand response for both prospective and current customers. Many customers face challenges in comprehending incentive structures and program mechanics related to demand response initiatives. Therefore, conducting educational workshops can address these knowledge gaps and provide customers with valuable insights into baseline measurement methodologies, the overall EM&V process, and the estimation of potential benefits. By enhancing customer understanding, these workshops can contribute to improved retention rates, particularly for key accounts that contribute significantly to kW reductions.
- Implement Cross-Promotion Strategies: Explore opportunities to cross-promote the Large C&I Demand Response program with relevant projects under the Large C&I Solutions umbrella. Large C&I Solutions initiatives often involve customer engagements centered on building commissioning or the deployment of building automation systems (BAS). Capitalizing on these engagements presents an ideal scenario to advocate for the registration of BAS-covered systems for demand response load shedding rebates. By aligning incentives and highlighting the synergies between demand response and BAS implementation, businesses can be incentivized to actively participate in demand response activities, thus furthering energy efficiency objectives and maximizing program impact.

2.1.3.16 Small Commercial Solutions Findings and Recommendations

Below are key findings for this program after the evaluation.

- High Satisfaction Levels: Survey respondents expressed overall satisfaction with the program, with approximately 80% indicating positive feedback. Notably, one-third of participants reported observing tangible energy savings reflected in their utility bills subsequent to program participation, indicating a perceived effectiveness in achieving energy efficiency goals.
- Barriers to Energy Efficiency Adoption: Among the most commonly cited barriers to embracing energy efficiency measures were the substantial upfront costs associated with acquiring energy-efficient equipment and a general lack of awareness regarding available incentives and support mechanisms. Addressing these hurdles is essential for fostering wider adoption of energy-saving technologies and practices among program participants.
- Suggestions for Program Enhancement: Survey respondents offered a range of suggestions aimed at enhancing the program's efficacy. Recommendations included the implementation of in-person assessments and support services, the expansion of rebate offerings to encompass a broader spectrum of energy-efficient upgrades, and intensified efforts in education and training initiatives to empower consumers with knowledge on energy-saving measures.
- Positive Perception Among Trade Allies: Near-participant trade allies exhibited a favorable view of the Small C&I Solutions program, recognizing its potential to facilitate small businesses in overcoming initial cost barriers associated with energy efficiency enhancements. Trade allies perceived the program as instrumental in enabling significant energy savings and enhancing energy efficiency standards across diverse industry sectors.
- Identified Challenges in Program Engagement: Despite acknowledging the program's potential benefits, near participant trade allies highlighted two primary challenges impeding their engagement. These

challenges included a need for enhanced clarity and information dissemination regarding program offerings and a perceived absence of tailored options catering to the specific needs and capacities of smaller businesses. Addressing these concerns is crucial for fostering greater participation and uptake of the program among target stakeholders.

Below are recommendations for this program after the PY13 evaluation.

- Clarification of Program Requirements: Trade allies expressed a need for clearer information regarding program requirements, particularly concerning approvals from the Design Lights Consortium (DLC). There was notable confusion among trade allies regarding DLC approvals, leading to uncertainties and potential unexpected costs during project execution. To address this, it is recommended to proactively educate trade allies about all program requirements to ensure they are well-informed and adequately prepared, thereby minimizing the risk of surprises or additional expenses for themselves or their clients.
- Enhanced Marketing Support for Trade Allies: To bolster the effectiveness of marketing efforts, it is suggested to provide enhanced marketing support to trade allies. This includes furnishing them with materials that not only enhance their credibility but also aid in elucidating the benefits and offerings of the program to end customers. Additionally, facilitating co-branding opportunities for trade allies alongside ENO in promotional materials can further bolster their visibility and credibility. Moreover, ensuring the availability of clear and easily understandable marketing materials equips trade allies with the resources needed to effectively communicate the value proposition of the program to their customers, thereby fostering greater engagement and participation.

2.1.3.17 Large C&I Solutions Findings and Recommendations

The following summarizes the key findings and conclusions from the evaluation.

- Incentives and Rebates Encourage Energy Efficiency: All trade allies interviewed unanimously agreed that program incentives and rebates play a crucial role in helping customers save money while promoting increased energy efficiency. These financial incentives serve as powerful motivators for customers to adopt energy-saving measures and technologies, ultimately driving positive environmental and economic outcomes.
- Program as a Catalyst for Business Growth: Trade allies highlighted the program as a potential catalyst for business growth. Specifically, four out of the eight interviewed trade allies identified the program as a valuable avenue for expanding their businesses. They emphasized that participation in the program enhances their credibility and trustworthiness in the eyes of customers, thus opening up opportunities for business expansion. Leveraging the reputation and credibility of the program further strengthens their position in the market, facilitating growth and market penetration.
- Administrative Processes as Barriers to Participation: Despite recognizing the benefits of the program, trade allies identified administrative processes, requirements, and procedures as significant barriers to participation. Specifically, they cited detailed documentation requirements during the application process and the burden of extensive paperwork as impediments to interaction with the program. This issue is particularly pronounced for small companies that may lack the necessary infrastructure to

support their participation, underscoring the need for streamlining administrative procedures to improve accessibility and participation rates.

- Concerns about Market Saturation: Responding trade allies expressed concerns about market saturation, particularly in the New Orleans area. Half of the interviewed trade allies perceived market saturation as a significant challenge, noting that many potential clients have already completed energy-saving projects. This saturation poses a challenge for trade allies seeking new business opportunities and underscores the importance of exploring innovative strategies to reach untapped markets or differentiate services in a competitive landscape.

The following summarizes key recommendations after completing the PY13 evaluation.

- Reevaluate Program Incentives: Feedback from six out of eight trade allies highlighted concerns regarding the adequacy of program incentives. They noted that the current incentives may not always meet expectations, and the payment process following project completion can strain the finances of small businesses. To address this, the program should consider reassessing and potentially recalibrating its incentive structure to ensure that it provides tangible benefits that adequately reward trade allies for their participation. Moreover, in light of market saturation, there's an opportunity to explore expanding program offerings to incentivize greater engagement and participation among trade allies.
- Reassess Trade Ally Ranking System: Some interviewed trade allies raised issues regarding the effectiveness and fairness of the current trade ally ranking system on the program's website. They pointed out that the existing system may not accurately reflect the quality and capabilities of listed companies, creating disparities and challenges for all participants. Therefore, it's advisable for the program to conduct a comprehensive reassessment of the ranking system to ensure transparency, fairness, and alignment with the actual performance and expertise of trade allies.
- Simplify Application Process and Minimize Paperwork: All trade allies unanimously expressed the need for improvements in the application process and paperwork requirements. Streamlining these processes and reducing paperwork burdens would not only alleviate the administrative burden on trade allies but also enhance efficiency and encourage greater participation and repeat engagement. By simplifying procedures and minimizing paperwork, Entergy can create a more user-friendly and accessible experience for trade allies, fostering a conducive environment for program involvement and collaboration.
- Enhance Marketing Support to Trade Allies: To bolster the effectiveness of marketing efforts, it's essential for the program to provide enhanced support and resources to trade allies. This includes furnishing materials that enhance credibility for trade allies and effectively communicate the benefits and offerings of the program to end customers. Moreover, facilitating co-branding opportunities between trade allies and the program can strengthen partnerships and build trust among customers. Additionally, making clear, concise, and easy-to-understand marketing materials readily available to trade allies will empower them to effectively convey program details and benefits to their customers, ultimately driving greater awareness and participation.

2.1.3.18 C&I New Construction Findings and Recommendations

The following summarizes the key findings and conclusions from the PY13 evaluation.

- Addressing Lack of Potential Customers: Trade allies expressed a keen interest in participating in the program; however, they identified a significant barrier stemming from the limited availability of potential customers in the New Orleans area. The shortage of construction-related business opportunities poses a challenge for trade allies seeking to engage with the program effectively. To overcome this barrier, the program should explore strategies to stimulate demand and create a conducive environment for energy efficiency projects. This may involve targeted marketing campaigns, outreach initiatives, and partnerships with local businesses and community organizations to raise awareness about the program's benefits and incentivize participation.
- Navigating DLC Requirements: Interviewed trade allies highlighted challenges associated with meeting the stringent requirements set forth by the DLC. The rigidity and specificity of DLC criteria can pose difficulties for lighting-related companies in adhering to their specifications. Moreover, the dynamic nature of product listings and potential delisting from DLC or ENERGY STAR ratings during the course of a project further complicates matters, potentially impacting rebate payments and creating operational hurdles for service providers. To address this challenge, Entergy should work closely with trade allies to provide comprehensive guidance and support in navigating DLC requirements. This may involve offering training sessions, resources, and technical assistance to ensure compliance with standards and streamline the certification process. Additionally, establishing clear communication channels with DLC and other relevant regulatory bodies can facilitate timely updates and mitigate potential disruptions caused by product delisting or rating changes.

The following summarizes key recommendations after completing the PY13 evaluation.

- Reevaluating Program Incentives: It is advisable to reassess the current structure of program incentives, especially considering the financial constraints faced by service providers, particularly smaller firms, and the financial burden associated with larger projects. Implementing a system to help offset upfront costs for service providers could significantly alleviate financial barriers and encourage broader participation in the program. This might involve offering upfront grants, low-interest loans, or other financial incentives tailored to the needs of different types of service providers. By providing financial support, the program can foster greater engagement from a diverse range of service providers and facilitate the implementation of energy efficiency projects across various scales.
- Enhancing Marketing Support to Trade Allies: To bolster the effectiveness of marketing efforts and enhance the credibility of trade allies, it is essential to provide comprehensive marketing support and resources. This includes developing materials that not only highlight the benefits of the program but also showcase the expertise and credibility of participating trade allies. By allowing and supporting co-branding initiatives between trade allies and the program, the program can leverage the reputation and trust established by trade allies within their respective communities. Clear and easy-to-understand marketing materials should be made readily available to trade allies, empowering them to effectively communicate the value proposition of the program to their customers. Additionally, providing training and guidance on marketing strategies can further equip trade allies with the necessary tools to promote the program and drive customer engagement effectively.

2.1.3.19 PFI Findings and Recommendations

The following summarizes the key findings and conclusions from the PY13 evaluation.

- Favorable Perception of the PFI Program: Trade allies express a positive sentiment towards the PFI program, highlighting its role in expanding their service offerings to clients. Both allies appreciate the opportunities afforded by the program to deliver enhanced energy efficiency solutions to publicly funded institutions seeking upgrades. By leveraging the support of the program, trade allies can effectively address the energy efficiency needs of institutional clients, thereby fostering greater sustainability and cost savings within these sectors.
- Barriers to Customer Engagement: Trade allies identify a lack of resources and informational materials as significant barriers to customer engagement. They express concern that despite potential interest from customers, the absence of informational brochures or support materials hinders their ability to effectively inform clients about the program. This gap in resources limits their capacity to educate customers and guide them towards informed decisions regarding energy efficiency upgrades. Providing comprehensive informational resources and support tools can empower trade allies to better communicate the benefits of the program and facilitate customer engagement.
- Challenges with Current Incentive Structure: Both trade allies voice concerns regarding the effectiveness of the current incentive structure. They note that the incentives offered may not always be compelling, particularly for smaller businesses. Moreover, the process of receiving incentives poses challenges, as trade allies often have to finance projects upfront and wait for incentives upon project completion. Additionally, trade allies highlight the difficulty in selling energy efficiency upgrades to customers who may only seek repairs for malfunctioning systems, rather than investing in upgrades for improved efficiency. Addressing these challenges may require reevaluating the incentive structure to make it more attractive and accessible to trade allies, as well as developing strategies to educate customers about the long-term benefits of energy efficiency upgrades.

There following were recommendations to the PFI in PY13.

- Enhanced Marketing Support: The program can play a pivotal role in supporting trade allies by providing comprehensive marketing materials and official documentation. These resources can serve as valuable tools for contractors to effectively communicate the benefits of the program to potential customers. Suggestions include additional advertising efforts to raise awareness of the program and endorsements provided by the program to endorse trade allies, thereby enhancing their credibility and helping them secure more customers. By equipping trade allies with the necessary marketing support, the program can facilitate greater outreach and engagement within the community, ultimately driving increased participation in the program.
- Consideration of Incentive Structure: Interviewed trade allies suggest that the program should consider revising the incentive structure to better incentivize customers, particularly those who are first-time users of the program. There is a consensus among trade allies that offering more attractive incentives could significantly enhance the appeal of the program and encourage broader participation. Additionally, trade allies advocate for expanding the program's focus to include more substantial improvements in buildings, such as promoting distributed energy generation or combined heat and

power (CHP) systems. By incentivizing these advanced energy solutions, the program can position trade allies as valuable partners to their customers, driving innovation and sustainability in building practices.

2.1.4 COST-EFFECTIVENESS EVALUATION FINDINGS

See Appendix B: Cost-Effectiveness Analysis of this report for additional information on the approach.

2.1.4.1 Results by Program

The results of the cost effectiveness analysis are in the table below.

TABLE 2-21 COST TEST RESULTS BY PROGRAM

Program	TRC	UCT	RIM	PCT	SCT
HPwES	1.14	0.99	0.31	4.40	1.33
RLA	0.69	0.81	0.27	2.96	0.73
MF Solutions	1.35	1.46	0.38	3.96	1.71
IQW	1.26	1.37	0.45	2.90	1.64
A/C Solutions	1.90	1.97	0.47	4.59	2.36
SK&E	0.69	0.67	0.25	6.08	0.78
AR&R	0.09	0.09	0.07	1.73	0.11
Behavioral	0.73	0.73	0.32	NA	0.73
EasyCool (BYOT)	0.62	0.44	0.44	0.00	0.62
PTR Pilot	0.08	0.07	0.07	NA	0.08
BESS Pilot	0.12	0.11	0.11	NA	0.12
Small C&I Solutions	1.16	1.54	0.31	4.48	1.42
Large C&I Solutions	1.60	1.93	0.35	6.22	1.99
PFI	0.76	0.93	0.27	4.20	0.94
C&I NC Solutions	0.09	0.12	0.10	0.61	0.11
Large C&I DR	0.67	0.46	0.45	NA	0.67
EV Charging Pilot	0.04	0.04	0.04	NA	0.04
Total	**1.16**	**1.26**	**0.35**	**4.56**	**1.42**

2.1.4.2 Avoided Replacement Cost

The Evaluators included an adjustment to incremental costs accounting for ARC associated with LED lamps.

TABLE 2-22 AVOIDED REPLACEMENT COST SUMMARY BY PROGRAM

Program	*Ex Post* Gross ARC ($)	*Ex Post* Net ARC ($)	NPV of ARC ($)
HPwES	$24,522	$14,120	$14,120
RLA	$40,015	$27,762	$27,762
MF Solutions	$1,794	$1,363	$1,363
IQW	$2,448	$2,448	$2,448
A/C Solutions	$0	$0	$0
SK&E	$5,252	$5,252	$5,252
AR&R	$0	$0	$0
Behavioral	$0	$0	$0
EasyCool (BYOT)	$0	$0	$0
PTR Pilot	$0	$0	$0
BESS Pilot	$0	$0	$0
Small C&I Solutions	$64,309	$63,813	$63,813

Large C&I Solutions	$394,458	$380,729	$380,729
PFI	$97,133	$90,337	$90,337
C&I NC Solutions	$300	$235	$235
Large C&I DR	$0	$0	$0
EV Charging Pilot	$0	$0	$0
Total	**$630,231**	**$586,058**	**$586,058**

Sums may differ due to rounding.

The method used in the evaluation is described in Section 3.4.1.3.

3 EVALUATION METHODOLOGY

The general approach for calculation of verified energy savings (kWh) and demand reductions (kW) was to use the NO TRM V6.1. Further detail can be found in each program chapter for relevant measures. For demand response programs, the general approach for calculation of verified demand reductions (kW) was to use a Billing Data Analysis.

The gross impact evaluation effort included the following:

- Desk Reviews: The Evaluators utilized the NO TRM V6.1 values in assessing *ex post* gross energy savings (kWh) and demand reductions (kW). In addition to the TRM, the Evaluators also examined Excel workbooks and supplemental documentation used by implementation staff to assess savings by measure. The workbook utilizes TRM savings algorithms with trade ally inputs to calculate savings based on the measure and input parameters. The Evaluators verified the factor tables for each measure to ensure the values were appropriate.
- Data Tracking Review: Project data from the implementers was reviewed to ensure that tracking systems followed the TRM.
- Site Visits: Site visits were conducted on an as needed basis, where sites with higher uncertainties in project documentation were selected for on-site verification.
- Survey Analysis: Where applicable, results from participant survey results were utilized to determine in-service-rates and verification of savings parameters.
- Billing Data Analysis: Billing data analysis was performed for all DR programs and the Behavioral program. Billing analysis is effective when there is a large, relatively homogenous pool of participant customers implementing similar measures. The analysis compares consumption during DR events with baseline consumption. A Site-Specific Billing Data Analysis was used for the Large C&I DR program. The analysis compares consumption during DR events with baseline consumption on a site-specific basis.

This section details general evaluation methodologies by program-type as well as data collection methods applied to this evaluation and methods and activities used in the PY13 evaluation. This section will present full descriptions of gross savings estimation; net savings estimation; sampling methodologies; process evaluation methodologies; and data collection procedures.

3.1 Glossary of Terminology

As a foundational step in elucidating the evaluation methodologies, the Evaluators have provided an extensive glossary of terms:

- Baseline: The conditions, encompassing energy consumption, anticipated to occur in the absence of the subject energy efficiency activity. Baseline conditions are sometimes denoted as "business-as-usual" circumstances.
- Deemed Savings: An estimation of the energy or demand savings outcome (gross savings) for a single unit of an installed energy efficiency measure. This estimate is derived from widely accepted data sources and analytical methods and is applicable to the evaluated situation (e.g., assuming 284 kWh savings for a low-flow showerhead).

- Effective Useful Life (EUL): Also known as measure life, this term often denotes persistence. EUL offers an estimate of the duration of savings from a particular measure.
- Evaluation: A comprehensive range of assessment studies and activities aimed at determining the effects of a program (and/or portfolio) and understanding or documenting program performance, market dynamics, energy savings, or program cost-effectiveness.
- Evaluation, Measurement, and Verification (EM&V): An overarching term for evaluation activities conducted at the measure, project, program, or portfolio level. EM&V encompasses impact, process, market, and planning activities and is distinct from Measurement and Verification (M&V).
- Savings: Presents the various types of savings.
- Impact Evaluation: The process of determining the program-specific, directly or indirectly induced changes attributable to an energy efficiency program.
- International Performance Measurement and Verification Protocol (IPMVP): A guiding document outlining a framework and definitions describing four M&V approaches, developed by the Energy Valuation Organization.
- Measure: The installation of a single piece of equipment, subsystem, or system, or a single modification of equipment, subsystem, system, or operation at an end-use energy consumer facility with the purpose of reducing energy and/or demand.
- Measurement and Verification (M&V): A subset of program impact evaluation that documents energy savings at individual sites or projects using various methods such as measurements, engineering calculations, statistical analyses, and computer simulation modeling.
- Portfolio: The collection of all programs conducted by an organization, addressing different customer segments or market sectors.
- Process Evaluation: A systematic assessment of an energy efficiency program or component aimed at documenting operations, identifying improvements, and increasing program efficiency or effectiveness while maintaining participant satisfaction.
- Program or Offering: An activity, strategy, or action undertaken by an implementer, defined by a unique combination of program strategy, participation pathway, market segment, marketing approach, and energy efficiency measure(s).
- Project: An activity involving one or multiple energy efficiency measures at a single facility or site.
- Gross Realization Rate: The ratio of Ex Post Gross Savings to Ex Ante Gross Savings, indicating the degree of realization of predicted savings.
- Rigor: The level of expected confidence and precision in evaluation results, with higher rigor indicating greater confidence in the accuracy and precision of the findings.
- Technical Reference Manual: A prepared resource document containing savings estimates, assumptions, guidelines, and supporting documentation for prescriptive energy efficiency measures, vetted by stakeholders.
- Uncertainty: The range or interval of doubt surrounding a measured or calculated value, within which the true value is expected to fall with some degree of confidence.
- Verification: An assessment confirming that the program or project has been implemented per the program design, ensuring installation rates, quality standards, and operational correctness align with the intended objectives.

3.2 Sampling Approach

3.2.1 SAMPLING

Programs are evaluated on one of three bases:

- Census of all participants.
- Simple Random Sample; and
- Stratified Random Sample

3.2.1.1 Census

A census of participant data was used for selecting programs where such review is feasible. All program measures were evaluated. Programs that received analysis of a census of participants include: HPwES, IQW, A/C Solutions, MF Solutions, AR&R, RLA and SK&E.

3.2.1.2 Simple Random Sampling

For programs with relatively homogenous measures (largely in the residential portfolio), the Evaluators conducted a simple random sample of participants. The sample size for verification surveys is calculated to meet 90% confidence and 10% precision (90/10). The sample size to meet 90/10 requirements is calculated based on the coefficient of variation of savings for program participants. Coefficient of Variation (CV) is defined as:

$$CV = \frac{Standard\ Deviation_x}{Mean_x}$$

Where x is the average kWh savings per participant. Without data to use as a basis for a higher value, it is typical to apply a CV of .5 in residential program evaluations. The resulting sample size is estimated at:

$$n_0 = \left(\frac{1.645 * CV}{RP}\right)^2$$

Where:

1.645 = Z Score for 90% confidence interval in a normal distribution
CV = Coefficient of Variation
RP = Required Precision, 10% in this evaluation

3.2.1.3 Stratified Sampling

For the C&I NC, PFI, Small and Large C&I Solutions programs, Simple Random Sampling is not an effective sampling methodology as the CV values observed in business programs are typically very high because the distributions of savings are generally positively skewed. Often, a relatively small number of projects account for a high percentage of the estimated savings for the program.

To address this situation, the evaluators use a sample design for selecting projects for the M&V sample that takes such skewness into account. With this approach, the evaluators select a number of sites with large savings for the sample with certainty and take a random sample of the remaining sites. To further improve the precision, non-certainty sites are selected for the sample through systematic random sampling. That is, a random sample of sites remaining after the certainty sites have been selected is selected by ordering them

according to the magnitude of their savings and using systematic random sampling. Sampling systematically from a list that is ordered according to the magnitude of savings ensures that any sample selected will have some units with high savings, some with moderate savings, and some with low savings. Samples cannot result that have concentrations of sites with atypically high savings or atypically low savings. As a result of this methodology, the required sample for the C&I NC, PFI, Small and Large C&I Solutions programs were reduced to the following strata.

TABLE 3-1 STRATIFIED SAMPLING SUMMARY

Program	Strata	Sites Sampled
Small C&I Solutions	4	25
Large C&I Solutions	4, plus 1 certainty	48
C&I NC	1	1
PFI	4	10

3.2.2 NET IMPACT CALCULATIONS

Table 3-2 summarizes the net savings approach used for each program.

TABLE 3-2 SUMMARY OF NET SAVINGS APPROACHES

Program	Participant Surveys	Literature Review	Billing Analysis/ Price Response Modeling	Deemed Value
HPwES	✓	✓		✓
HPwES Kits	✓	✓		✓
IQW		✓		✓
MF Solutions	✓	✓		✓
RLA	✓	✓	✓	✓
A/C Solutions	✓	✓		✓
SK&E and AR&R	✓	✓		✓
Behavioral			✓	
DR Program			✓	
Small C&I Solutions	✓			
Large C&I Solutions	✓			
PFI and C&I NC Solutions	✓			

3.3 Impact Evaluation

3.3.1 GROSS IMPACT

The Evaluators approach to savings analysis depends largely on the types of measures installed.

In the following subsections gross savings calculation methodologies are detailed by measure category, as is appropriate.

3.3.1.1 NO TRM V6.1

Whenever possible, deemed savings values and algorithms from the New Orleans Technical Reference Manual version 6.1[4] (herein referred to as the "New Orleans TRM" or simply, "NO TRM V6.1") were used to determine verified program impacts. Care was taken to ensure any assumptions were reasonable and current, and that there were no errors in the algorithms. For each measure in the program, total *ex post* gross energy savings (kWh) and demand reductions (kW) savings were determined as a product of the number of measures verified as qualifying for an incentive and the deemed savings per measure.

3.3.1.2 Deemed and Prescriptive Savings Calculations

For the PY13 evaluation, the Evaluators utilized the NO TRM V6.1 for deemed projects. The varied approaches are as follows below.

- Deemed Savings: The deemed savings approach involves analysis based on the NO TRM V6.1 or measure-specific work papers. This method utilizes predetermined savings values for measures with well-established and documented average savings. Verification of deemed values entails confirming installations through on-site inspection and/or telephone surveys. Implementation may entail using a single savings value for all installations of a specific measure (e.g., residential refrigerators) or conducting site-specific analyses using partially deemed unit energy savings algorithms (e.g., assessing savings from deemed commercial lighting retrofits). In the latter case, certain inputs into the savings calculation, such as lighting hours of use, are site-specific.
- Billing Data Analysis: Billing data analysis is applicable when there is a sizable, relatively homogeneous pool of participant customers implementing similar energy efficiency measures. This method is effective for programs installing multiple measures in individual homes, which impact similar end uses and exhibit interactive effects. The analysis typically involves regression modeling of participants and a non-participant control group, comparing energy use in both groups before and after participation. This analysis method is utilized on demand response and behavioral programs and could potentially extend to weatherization programs.
- Site-Specific Custom: This approach pertains to programs where savings calculations must be performed on a per-site basis using primary data collected on-site or facility bills for unique, premise-level analyses. It contrasts with the large-scale, whole-program analysis described under the "Billing Data Analysis" bullet point. Site-specific custom protocols are required for certain Commercial and Industrial (C&I) programs in the portfolio, necessitating tailored approaches such as those outlined in the International Performance Measurement and Verification Protocol (IPMVP).

The table below summarizes the approaches that were applied.

[4] The New Orleans TRM can be found here: https://www.entergy-neworleans.com/energy_efficiency/energy_smart_filings/

TABLE 3-3 SAVINGS ESTIMATION APPROACHES FOR ENERGY SMART PROGRAMS

Sector	Program	Approach to Savings Estimation
Residential	HPwES	Deemed Savings
	IQW	Deemed Savings
	MF Solutions	Deemed Savings
	A/C Solutions	Deemed Savings
	RLA	Deemed Savings
	SK&E	Deemed Savings
	EasyCool BYOT	Whole Program Billing Analysis
	PTR	Whole Program Billing Analysis
	BESS	Whole Program Billing Analysis
	EV Pilot	Whole Program Billing Analysis
	Behavioral	Whole Program Billing Analysis
	AR&R	Deemed Savings
C&I	Small C&I Solutions	Deemed Savings
	Large C&I Solutions	Deemed Savings/Site-Specific Custom
	PFI	Deemed Savings/Site-Specific Custom
	C&I NC	Site-Specific Custom/Site-Specific Custom
	Large C&I DR	Site-Specific Billing Analysis

3.3.1.3 Avoided Replacement Costs

Avoided replacement costs associated with energy efficiency measures were derived from the AR TRM Version 9.1: Protocol L3: Non-Energy Benefits of Avoided and Deferred Equipment Replacement Costs.

The Evaluator utilizes the following two Protocols to calculate avoided replacement costs for Replacement on Burnout (ROB) measures:

- ROB 1 – baseline and efficient measures that have different useful lifetimes under static baselines over the lifetime of the measures; and
- ROB 2 - baseline and efficient measures that have different useful lifetimes under changing baselines over the lifetime of the measures.

The avoided replacement costs are summarized mathematically as:

$$Avoided\ Replacement\ Cost = NPV(RDR, ML, RLCC_t)$$

$$NPV = Net\ Present\ Value\ function = \sum_{t=1}^{ML} \frac{RLCC_t}{(1+RDR)^t}$$

Where:

RDR = Real Discount Rate

ML = Program Measure Life (EUL)

$RLCC_t$ = Real Levelized Carrying Charge in year t (annualized baseline installed cost at RDR)

The following equation defines the ARCs for ROB 1, under the assumption of different EULs for baseline and efficient measures and static baselines:

$$Avoided\ Replacement\ Cost = \ -PV(RDR, ML - EUL_B, RLCC_B)/(1 + RDR)^{EUL_B}$$

Where:

RDR = Real Discount Rate

ML = Program Measure Life (EUL)

EUL_B = Baseline Equipment Life

$RLCC_B$ = -PMT (RDR, EUL_B, Baseline Installed Cost)

The following equations define the ARC for ROB 2, under the assumption of different EULs for baseline and efficient measures and changing baselines:

$$Avoided\ Replacement\ Cost = ARC\ (Tier\ 1) + ARC\ (Tier\ 2)$$
$$ARC\ (Tier\ 1) = \ -PV(RDR, NY - EUL_{T1}, RLCC_{T1})/(1 + RDR)^{EUL_{T1}}$$
$$ARC\ (Tier\ 2) = \ -PV(RDR, ML - NY, RLCC_{T2})/(1 + RDR)^{NY}$$

Where:

RDR = Real Discount Rate

ML = Program Measure Life (EUL)

EUL_{T1} = Baseline Equipment Life (Tier 1)

$RLCC_{T1}$ = -PMT (RDR, EUL_{T1}, Baseline Installed Cost (Tier 1))

EUL_{T2} = Baseline Equipment Life (Tier 2)

$RLCC_{T2}$ = -PMT (RDR, EUL_{T2}, Baseline Installed Cost (Tier 2))

NY = Number of years of Tier 1 installation

ARC estimates are found in each of the program chapters within this report.

3.3.1.4 Deviations from the New Orleans TRM

There were no diversions from the NO TRM.

3.3.1.5 Tracking System Review

The impact evaluation began with a review of program tracking data. The tracking data included a separate row for each measure installed. Every premise in the program had a unique incentive identifier, so each premise had multiple rows to reflect the different measures completed.

3.3.1.6 Literature Review

Literature reviews were performed to evaluate gross impacts of measures that were not found in site visits or had low samples. In cases where there are small samples, the literature review may be averaged with the site visit impact. Those literature reviews are found below.

TABLE 3-4 APS LITERATURE REVIEW RESULT

Source	Utility	Measure Name	Delivery Mechanism	In-Service Rate
2023 CPS Energy TRM	CPS Energy, TX	SF Smart Strip	DI in Wx	100.0%
2022 Hawaii TRM	NA	APS	DI in SF	100.0%
IL TRM V11.0	NA	APS	DI in SF	100.0%
MO Ameren PY21 EM&V	NA	APS	DI in SF	95.0%
PY23 EM&V Report	OG&E AR	APS	DI in SF	98.8%
				98.8%

TABLE 3-5 CEILING INSULATION LITERATURE REVIEW RESULT

Source	Utility	Measure Name	Delivery Mechanism	In-Service Rate
PY21 EM&V Report	Entergy, AR	SF Envelope	TA Installed Wx	100.0%
PY21 EM&V Report	Entergy, AR	MF Envelope	TA Installed Wx	100.0%
PY18 EM&V Report	RMP Utah	Envelope Wx	TA Installed Wx	100.0%
PY23 EM&V Report	OG&E AR	Ceiling Insulation	TA installed Wx	97.0%
PY8 SWEPCO EM&V Report	SWEPCO LA	Ceiling Insulation	TA installed Wx	100.0%
				99.4%

TABLE 3-6 ENERGY STAR DISHWASHER LITERATURE REVIEW RESULT

Source	Utility	Measure Name	Delivery Mechanism	In-Service Rate
Rhode Island TRM	RI TRM PY23	ENERGY STAR Dishwasher	Not specific	100.0%
PY2021 Residential Impact Report	Ameren IL PY2021	ENERGY STAR Dishwasher	Not specific	100.0%
				100.0%

TABLE 3-7 HEAT PUMP WATER HEATER LITERATURE REVIEW RESULT

Source	Utility	Measure Name	Delivery Mechanism	In-Service Rate
Rhode Island TRM	RI TRM PY23	HPWH	TA Installed	100.0%
PY2022 Black Hills EM&V Report	Black Hills, CO	HPWH	TA Installed	100.0%
PY21 - PY22 EM&V Report	Avista, WA	HPWH	TA Installed	100.0%
PY2022 EM&V Report	JCP&L, NJ	HPWH	TA Installed	100.0%
				100.0%

TABLE 3-8 SMART THERMOSTAT LITERATURE REVIEW RESULT

Source	Utility	Measure Name	Delivery Mechanism	In-Service Rate
2022 Hawaii TRM	NA	Smart thermostat	Not Specific	90.0%
PY22 EM&V Report	OG&E AR	Smart thermostat	TA Installed	100.0%
PY21 EM&V Report	SWEPCO AR	Smart thermostat	TA Installed	100.0%
2023 Rhode Island TRM	NA	Smart thermostat	Not Specific	100.0%
PY2022 Black Hills EM&V Report	Black Hills, CO	Smart thermostat	Not specific	100.0%
				98.0%

TABLE 3-9 BATHROOM AND KITCHEN AERATOR LITERATURE REVIEW RESULT

Source	Utility	Measure Name	Delivery Mechanism	In-Service Rate
PY21 EM&V Report	Entergy, AR	MF Domestic Hot Water	TA Installed Wx	100.0%
IL TRM V11.0	NA	Aerator	DI ISR	93.0%
New Orleans TRM V6.0	NA	Aerator	DI ISR	98.0%
IA TRM V7.0	NA	Aerator	DI ISR	95.0%
PY23 EM&V Report	OG&E AR	Aerator	TA installed Wx	100.0%
				97.2%

TABLE 3-10 HEAT PUMP REPLACEMENT LITERATURE REVIEW RESULT

Source	Utility	Measure Name	Delivery Mechanism	In-Service Rate
PY9 EM&V Report	SWEPCO LA	HP Replacement	TA Installed	100.0%
PY23 EM&V Report	OG&E AR	HP Replacement	TA Installed	100.0%
PY21 EM&V Report	SWEPCO AR	HP Replacement	TA Installed	100.0%
2023 Rhode Island TRM	NA	Central Heat Pump	TA Installed	100.0%
				100.0%

TABLE 3-11 LED LAMP LITERATURE REVIEW RESULT

Source	Utility	Measure Name	Delivery Mechanism	In-Service Rate
PY9 EM&V Report	SWEPCO LA	LED Lamp	TA Installed	100.0%
2023 CPS Energy TRM	CPS Energy, TX	LED Lamp	Not Specific	97.0%
AR TRM V9.1	NA	LED Lamp	Not Specific	97.0%
PY23 EM&V Report	OG&E AR	LED Lamp	DI in Wx	100.0%
Hawaii TRM PY2022	NA	LED Lamp	Not specific	97.0%
				98.2%

TABLE 3-12 LOW-FLOW SHOWERHEAD LITERATURE REVIEW RESULT

Source	Utility	Measure Name	Delivery Mechanism	In-Service Rate
PY21 EM&V Report	Entergy, AR	MF Domestic Hot Water	TA Installed Wx	100.0%
2022 Hawaii TRM	NA	Low-Flow Showerheads	DI ISR	93.0%
IL TRM V11.0	NA	Low-Flow Showerheads	DI ISR	96.0%
New Orleans TRM V6.0	NA	Low-Flow Showerheads	DI ISR	98.0%
IA TRM V7.0	NA	Low-Flow Showerheads	DI ISR	98.0%
PY23 EM&V Report	OG&E AR	Low-Flow Showerheads	TA installed Wx	100.0%
				97.5%

TABLE 3-13 DUCT SEALING LITERATURE REVIEW RESULT

Source	Utility	Measure Name	Delivery Mechanism	In-Service Rate
PY21 EM&V Report	SWEPCO AR	Duct Sealing	TA Installed	99.7%
PY21 EM&V Report	OG&E AR	Duct Sealing	TA Installed	100.0%
PY11 EM&V Report	Entergy NO	Duct Sealing	TA Installed	94.4%
2021 Rhode Island TRM	NA	Duct Sealing	Not Specific	100.0%
				98.5%

TABLE 3-14 ENERGY STAR CLOTHES DRYER LITERATURE REVIEW RESULT

Source	Utility	Measure Name	Delivery Mechanism	In-Service Rate
PY2022 EM&V Report	Nicor Gas	Clothes Dryer	Retail Buy-down	100.0%
PY21 - PY22 EM&V Report	Pacific Power CA	Clothes Dryer	Rebate	100.0%
PY20 Efficient Product EM&V Report	EfficiencyOne CA	Clothes Dryer	Rebate	100.0%
CT V20.0 TRM	NA	Clothes Dryer	Rebate	100.0%
				100.0%

TABLE 3-15 AIR CONDITIONER REPLACEMENT LITERATURE REVIEW RESULT

Source	Utility	Measure Name	Delivery Mechanism	In-Service Rate
PY11 EM&V Report	Entergy NO	AC Replacement	TA Installed	100.0%
PY21 EM&V Report	OG&E AR	AC Replacement	TA Installed	100.0%
PY21 EM&V Report	SWEPCO AR	AC Replacement	TA Installed	100.0%
2021 Rhode Island TRM	NA	Air Conditioning	TA Installed	100.0%
CT V20.0 TRM	NA	Window AC	Rebate	100.0%
				100.0%

TABLE 3-16 ENERGY STAR AIR PURIFIER LITERATURE REVIEW RESULT

Source	Utility	Measure Name	Delivery Mechanism	In-Service Rate
MA 2021 eTRM	NA	Room Air Cleaners	Not Specific	97.0%
RI 2021 TRM	NA	Room Air Cleaners	Not Specific	97.0%
PY21 EM&V Report	Entergy, AR	SF Appliances	DI in SF	78.2%
PY21 EM&V Report	OG&E AR	Air Purifiers	Mail-in-Rebate	100.0%
PY18 EM&V Report	RMP Utah	Appliances in SF	Mail-in-Rebate	100.0%
PY21 EM&V Report	SWEPCO AR	Air Purifier	DI in Wx	92.9%
				94.2%

TABLE 3-17 ENERGY STAR WINDOWS LITERATURE REVIEW RESULT

Source	Utility	Measure Name	Delivery Mechanism	In-Service Rate
PY2022 Statewide EM&V Report	Connecticut	Windows	Rebate	98.0%
PY2023 EM&V Report	SWEPCO AR	Windows	Rebate	100.0%
PY12 EM&V Report	New Orleans	Windows	Rebate	100.0%
				99.3%

TABLE 3-18 ENERGY STAR POOL PUMP LITERATURE REVIEW RESULT

Source	Utility	Measure Name	Delivery Mechanism	In-Service Rate
PY21 EM&V Report	DTE	Pool Pump	Mail-in-Rebate	85.0%
PY10 EM&V Report	Entergy NO	Pool Pump	Mail-in-Rebate	100.0%
2021 Rhode Island TRM	NA	Pool Pump	Mail-in-Rebate	100.0%
				95.0%

TABLE 3-19 AIR INFILTRATION LITERATURE REVIEW RESULT

Source	Utility	Measure Name	Delivery Mechanism	In-Service Rate
PY2022 Statewide EM&V Report	Connecticut	Air Sealing	TA Installed	92.0%
PY2023 EM&V Report	SWEPCO AR	Air Sealing	TA Installed	100.0%
PY2023 EM&V Report	OG&E AR	Air Sealing	TA Installed	99.0%
IL V11.0 TRM	NA	Air Sealing	TA DI	100.0%
				97.8%

TABLE 3-20 SCHOOL KIT LITERATURE REVIEW RESULT

Source	Utility	Measure Name	Delivery Mechanism	In-Service Rate
IL V11.0TRM	NA	Wx School Kit	Schools	58.0%
IL V11.0TRM	NA	School EE Kit	Schools	83.8%
Iowa V7.0 TRM	NA	School EE Kit	Schools	60.0%
Ameren Missouri PY21 TRM V2.0	NA	School EE Kit	Schools	90.0%
				73.0%

TABLE 3-21 FREEZER RECYCLING LITERATURE REVIEW RESULT

Source	Utility	Measure Name	Delivery Mechanism	In-Service Rate
MA - 1.3.2023 - eTRM	MASS Saves	Refrigerator/Freezer Recycling	TA Pickup	100.0%
Rhode Island 2023 TRM	National Grid	Freezer Recycling (ENERGY STAR Electric)	TA Pickup	100.0%
				100.0%

TABLE 3-22 REFRIGERATOR RECYCLING LITERATURE REVIEW RESULT

Source	Utility	Measure Name	Delivery Mechanism	In-Service Rate
MA - 1.3.2023 - eTRM	MASS Saves	Refrigerator/Freezer Recycling	TA Pickup	100.0%
Rhode Island 2023 TRM	National Grid	Recycling Refrigerator (SF Electric)	TA Pickup	100.0%
				100.0%

TABLE 3-23 REFRIGERATOR REPLACEMENT LITERATURE REVIEW RESULT

Source	Utility	Measure Name	Delivery Mechanism	In-Service Rate
MA - 1.3.2023 - eTRM	MASS Saves	Refrigerators (ENERGY STAR)	Rebate	100.0%
Rhode Island 23 TRM	National Grid	Replacement Refrigerator (SF)	Rebate	100.0%
				100.0%

TABLE 3-24 MAILER PULL KIT REVIEW RESULT

Source	Utility	Measure Name	Delivery Mechanism	In-Service Rate
IL V11.0 TRM	NA	Market Rate Kit	Direct mail	91.8%
IL V11.0 TRM	NA	LI Kit	Direct mail	60.0%
IL V11.0 TRM	NA	Wx Kit	Direct mail	68.0%
NO TRM V6.0	Entergy New Orleans	Mailer Kit	Direct mail	62.0%
Ameren MO TRM 2022	Ameren, MO	Mailer Kit	Direct mail	54.0%
Ameren MO TRM 2022	Ameren, MO	Mailer Kit	Direct mail	100.0%
				72.6%

TABLE 3-25 MAILER PUSH KIT LITERATURE REVIEW RESULT

Source	Utility	Measure Name	Delivery Mechanism	In-Service Rate
Vermont 2018 TRM	NA	Low-Flow Showerhead	Home Energy Kit	56.0%
Vermont 2018 TRM	NA	Aerator (bath/kitchen)	Home Energy Kit	57.0%
Vermont 2018 TRM	NA	Advanced Power Strips	Home Energy Kit	63.0%
Vermont 2018 TRM	NA	LED Lamp	Home Energy Kit	90.0%
IL V11.0 TRM	NA	Wx Measure	Home Energy Kit	60.0%
				65.2%

TABLE 3-26 PIPE INSULATION LITERATURE REVIEW RESULT

Source	Utility	Measure Name	Delivery Mechanism	In-Service Rate
CT V20.0 TRM	NA	Pipe Insulation (Residential)	TA DI	72.0%
IL V11.0 TRM	NA	Domestic Hot Water Pipe Insulation	TA DI	100.0%
RI 2023 TRM	NA	Pipe Insulation	TA DI	90.0%
				87.3%

3.3.1.7 In-Services Rates to be Applied

The table below outlines the ISR values to be applied in the residential desk reviews. The ISR values were estimated using participant survey responses, site visit observations, literature review results, past evaluation results.

TABLE 3-27 RESIDENTIAL ISR VALUES

Program	Measure	NO TRM V6.1 ISR	PY13 Survey ISR	PY13 Site Visit ISR	Lit Review ISR	PY12 (2022) ISR	PY13 ISR
A/C Solutions	AC Replacement	NA	NA	NA	100%	100%	100%
A/C Solutions	AC Tune-up	NA	NA	100%	NA	97%	99%
A/C Solutions	Duct Sealing	NA	NA	98%	99%	100%	99%
A/C Solutions	Ductless Heat Pump	NA	NA	NA	100%	100%	100%
A/C Solutions	Smart Thermostat	NA	NA	NA	98%	100%	99%
AR&R	Freezer Recycling	NA	100%	100%	100%	100%	100%
AR&R	Refrigerator Recycling	NA	100%	100%	100%	100%	100%
AR&R	Refrigerator Replacement	NA	NA	NA	100%	100%	100%
HPwES	Smart Thermostat	NA	100%	100%	98%	100%	100%

HPwES	Water Heater Pipe Insulation	NA	100%	100%	87%	96%	96%
HPwES	Low-Flow Showerhead	98%	NA	100%	98%	98%	98%
HPwES	DI - LED Lamp	NA	100%	99%	98%	92%	97%
HPwES	Aerator	98%	100%	100%	97%	50%	89%
HPwES	Pull Kit - Low-Flow Showerhead	62%	53%	100%	73%	59%	69%
HPwES	Pull Kit - LED Lamp	NA	33%	100%	73%	71%	69%
HPwES	Pull Kit - Aerator	45%	50%	100%	73%	44%	62%
HPwES	Duct Sealing	NA	100%	84%	99%	102%	96%
HPwES	Attic Insulation	NA	100%	100%	99%	100%	100%
HPwES	Air Infiltration	NA	86%	72%	98%	95%	88%
HPwES	Advanced Power Strip (Tier 2)	NA	100%	69%	99%	77%	86%
HPwES	Push Kit - LED Lamp (x3)	NA	NA	NA	65%	71%	68%
HPwES	Assessment	NA	NA	NA	NA	100%	100%
IQW	Smart Thermostat	NA	100%	100%	98%	100%	100%
IQW	Water Heater Pipe Insulation	NA	NA	100%	87%	96%	94%
IQW	Low-Flow Showerhead	98%	50%	100%	98%	100%	89%
IQW	LED Lamp	NA	54%	100%	98%	96%	87%
IQW	Aerator	98%	100%	100%	97%	97%	98%
IQW	Duct Sealing	NA	89%	99%	99%	98%	96%
IQW	Attic Insulation	NA	100%	75%	99%	100%	94%
IQW	Assessment	NA	NA	NA	NA	100%	100%
IQW	Air Infiltration	NA	86%	80%	98%	95%	90%
IQW	Advanced Power Strip (Tier 2)	NA	100%	77%	99%	94%	92%
MF Solutions	Smart Thermostat	NA	50%	NA	98%	100%	83%
MF Solutions	Water Heater Pipe Insulation	NA	100%	NA	87%	100%	96%
MF Solutions	Low-Flow Showerhead	98%	50%	75%	98%	100%	84%
MF Solutions	LED Lamp	NA	50%	94%	98%	100%	85%
MF Solutions	Aerator	98%	50%	93%	97%	100%	88%
MF Solutions	Duct Sealing	NA	50%	NA	99%	100%	83%
MF Solutions	Attic Insulation	NA	50%	NA	99%	NA	75%
MF Solutions	Air Infiltration	NA	50%	NA	98%	100%	83%
MF Solutions	Advanced Power Strip (Tier 2)	NA	0%	NA	99%	100%	66%
RLA	LED Lamp (OLM)	NA	92%	NA	98%	85%	92%
RLA	LED Lamp (Upstream Rebate)	NA	NA	NA	98%	98%	98%
RLA	Smart Thermostat	NA	81%	NA	98%	94%	91%
RLA	Pool Pump	NA	NA	NA	95%	100%	98%
RLA	Low-Flow Showerhead	98%	100%	NA	98%	79%	94%
RLA	Refrigerator Replacement	NA	100%	NA	100%	100%	100%
RLA	Advanced Power Strip (Tier 1)	NA	83%	NA	99%	65%	82%
RLA	Heat Pump Water Heater	NA	NA	NA	100%	98%	99%
RLA	Window Air Conditioner	NA	NA	NA	100%	98%	99%
RLA	Aerator	45%	100%	NA	97%	73%	79%
RLA	Water Heater Pipe Insulation	NA	100%	NA	87%	42%	76%
RLA	Air Purifier	NA	NA	NA	94%	NA	94%
RLA	Dehumidifier	NA	NA	NA	NA	100%	100%
RLA	Advanced Power Strip (Tier 2)	NA	NA	NA	99%	65%	82%

RLA	Freezer Replacement	NA	NA	NA	100%	NA	100%
SK&E	School Kit - LED Lamp 9W (A Type)	NA	77%	NA	73%	70%	73%
SK&E	School Kit - LED Lamp 14W (A Type)	NA	69%	NA	73%	71%	71%
SK&E	School Kit - Low-Flow Showerhead	62%	62%	NA	73%	62%	65%
SK&E	School Kit - Kitchen Aerator (1.5)	45%	67%	NA	73%	45%	57%
SK&E	School Kit - Bathroom Aerator (1.0)	45%	76%	NA	73%	45%	60%
SK&E	School Kit - Weather Stripping (17")	NA	78%	NA	73%	59%	70%

3.3.2 NET IMPACT

This section discusses the approaches used to estimate net savings. This section provides additional detail on the approaches outline for each program in Table 3-2.

3.3.2.1 Literature Reviews

The Evaluators applied literature review values for specific measures in some programs for which survey responses were not obtained or had limited responses.

TABLE 3-28 AC REPLACEMENT NTG LITERATURE REVIEW SUMMARY

Source	Utility	Measure Name	Delivery Mechanism	NTG
2024 Rhode Island TRM	National Grid	AC Replacement	Quality Install	87.0%
2024 Rhode Island TRM	National Grid	MF AC Replacement	Quality Install	86.0%
MA - 1.3.2023 - eTRM	MASS Saves	AC Replacement	Quality Install	88.0%
PY2022 EM&V Report	SWEPCO AR	AC Replacement	TA Installed	62.3%
PY2022 EM&V Report	OG&E AR	AC Replacement	TA Installed	81.0%
				80.9%

TABLE 3-29 DUCT SEALING NTG LITERATURE REVIEW SUMMARY

Source	Utility	Measure Name	Delivery Mechanism	NTG
PY2022 EM&V Report	SWEPCO AR	Duct Sealing	TA Installed	96.9%
PY2022 EM&V Report	OG&E AR	Duct Sealing	TA Installed	91.9%
MA - 1.3.2023 - eTRM	MASS Saves	Duct Sealing and Insulation	TA Installed	86.0%
2024 Rhode Island TRM	National Grid	Duct Sealing	TA Installed	87.0%
				90.4%

TABLE 3-30 FREEZER RECYCLING NTG LITERATURE REVIEW SUMMARY

Source	Utility	Measure Name	Delivery Mechanism	NTG
2024 Rhode Island TRM	National Grid	Freezer Recycling (Electric)	Third Party Recycling	50.0%
MA - 1.3.2023 - eTRM	MASS Saves	Refrigerator/Freezer Recycling	Third Party Recycling	46.0%
				48.0%

TABLE 3-31 REFRIGERATOR RECYCLING NTG LITERATURE REVIEW SUMMARY

Source	Utility	Measure Name	Delivery Mechanism	NTG
2024 Rhode Island TRM	National Grid	Refrigerator Recycling (Electric)	Third Party Recycling	50.0%
MA - 1.3.2023 - eTRM	MASS Saves	Refrigerator/Freezer Recycling	Third Party Recycling	46.0%
				48.0%

TABLE 3-32 LOW-FLOW SHOWERHEAD NTG LITERATURE REVIEW SUMMARY

Source	Utility	Measure Name	Delivery Mechanism	NTG
PY2022 EM&V Report	SWEPCO AR	Low-Flow Showerhead	TA DI	97.6%
PY2022 EM&V Report	OG&E AR	Low-Flow Showerhead	TA DI	91.5%
2024 Rhode Island TRM	National Grid	Low-Flow Showerhead	TA DI	78.0%
MA - 1.3.2023 - eTRM	MASS Saves	Low-Flow Showerhead	TA DI	100.0%
				91.8%

TABLE 3-33 BATHROOM AND KITCHEN AERATOR NTG LITERATURE REVIEW SUMMARY

Source	Utility	Measure Name	Delivery Mechanism	NTG
PY2022 EM&V Report	SWEPCO AR	Aerator	TA DI	96.9%
PY2022 EM&V Report	OG&E AR	Aerator	TA DI	98.3%
2024 Rhode Island TRM	National Grid	Aerator	TA DI	93.0%
2024 Rhode Island TRM	National Grid	Aerator	TA DI	78.0%
				91.5%

TABLE 3-34 KIT (PULL) NTG LITERATURE REVIEW SUMMARY

Source	Utility	Measure Name	Delivery Mechanism	NTG
PY2023 EM&V Plan/TRM	Xcel, CO	Kit (Lighting)	Mailed, by request	78.0%
Water Saver Kit Measures Memo	CPUC	Kit Measures	Kit, varied	65.0%
				71.5%

TABLE 3-35 KIT (PUSH) NTG LITERATURE REVIEW SUMMARY

Source	Utility	Measure Name	Delivery Mechanism	NTG
PY2023 EM&V Plan/TRM	Xcel, CO	Kit (Lighting)	Giveaway	44.7%
				44.7%

3.3.2.2 Demand Response and Behavioral Programs

For DR and behavioral programs, it is typically assumed that there are neither spillover nor free-ridership effects (customers are not expected to curtail without participating).

For DR, although customers can find workarounds to make up for lost productivity due to demand response events, they are compensated only if they reduce their load during the peak demand window, the primary program goal.

As such, the NTG ratio for these programs is assumed to be 100%.

3.3.2.3 Low Income Programs

Assigned a NTG of 1.0 for the SK&E and IQW programs.

3.3.2.4 Non-Low Income Programs

This section discusses self-report methodologies used to estimate the net savings of the residential programs.

3.3.2.4.1 *HPwES Major Measure Free-Ridership*

The major measure free ridership approach was applied to "major measures" (duct sealing, air sealing, attic insulation, smart thermostats, and pipe insulation) rebated through HPwES. To accomplish this, the Evaluators administered a survey to program participants that contained questions regarding the participants' plans to implement the incentivized measures and the likelihood of implementing those measures in the absence of program incentives and informational support. Respondents who met all of the following criteria will be considered free riders; all others will not be considered free riders.

- The participant was planning to complete the same project/install the same measure in 2023 before learning about the program.
- The participant's budget would accommodate the full cost of the project/measure in the absence of program support.
- The participant would have completed the same project or done something more efficient without program support.
- The participant would have completed the same project/installed the same measure or something more energy efficient within one year if the program was not available.

3.3.2.4.2 *HPwES LED Lamp Free-Ridership*

The calculation of free ridership for LEDs that were installed through the HPwES program was based on the responses to questions on the following topics:

- Prior experience with similar energy saving equipment;
- Prior planning to purchase energy efficiency measures provided through the program; and
- Likelihood of installing similar equipment without the program.

3.3.2.4.2.1 Prior Experience

The program is designed to encourage customers to use efficiency measures that they previously did not have experience with by providing them at no cost to the customer. As such, a primary indicator of the likelihood that a participant is a free rider, is whether he or she has previously purchased a similar measure. Previous experience is used as an indicator of whether the customer would have coincidently purchased LEDs on their own.

Prior experience is assessed through the following question:

- FR1: Had you installed LED lamps in your home before you received them for free through the program?

Respondents indicating that they had not purchased LEDs before receiving them for free through the program were considered to have minimal to no prior experience with them, meaning that the intervention of the program is likely significantly influential in the energy savings resulting from them. These respondents receive an

overall free ridership score of 0 for this measure. Otherwise, free ridership is assessed using the following factors.

3.3.2.4.2.2 Prior Plans and Intentions

- Customers were asked as to whether they had any plans to purchase any LEDs before receiving them through the program:FR2: Before receiving these LED light bulbs, did you have plans to purchase LED bulbs the next time you bought light bulbs for your home?

Respondents who indicate that they had plans to purchase LEDs were given a plans score of 1. Respondents who said they did not have plans (responded "Don't Know" or "No" to FR2) were assigned a plans score of 0. Those that did not answer this question were not assigned a plans score.

3.3.2.4.2.3 Likelihood of Purchasing Measure

To assess the likelihood of LED purchase without the program, participants were asked the following question:

- FR3: If you had not received these LED bulbs, how likely would you have been to purchase four or more LED bulbs within the next 12 months?

The likelihood of purchasing was scored as:

- 1 - Very Unlikely (0)
- 2 - Unlikely (0.25)
- 3 - Neither unlikely or likely (0.5)
- 4 - Likely (0.75)
- 5 - Very likely (1)
- Don't know (0.5)

3.3.2.4.2.4 Likelihood of Purchasing Measure

For respondents who demonstrated prior experience with LEDs, the scores for the prior plans and likelihood of purchasing the measures were averaged to assign a measure-level free ridership score to each respondent.

3.3.2.4.3 *HPwES Energy Efficiency Kit Free-Ridership*

Participants that received an energy efficiency kit responded to questions about each of the measures provided through the kit to assess the likelihood that they would have installed the measures in the absence the program. The respondents were asked questions on the following:

- If they had previously installed the kit item before receiving it for free.
- If they had plans to purchase the kit item before receiving it for free.

For water measures (aerators and showerheads) kit recipients who indicated that they did not have plans or had not previously installed the items were determined to not be free riders. Respondents that had previously installed these kit items and said they would have installed the items if they had not received them for free were deemed to be free riders.

For LEDs, a likelihood score was incorporated. If a respondent indicated they had past experience and plans to purchase the LEDs, free ridership was based on the respondent's likelihood that they would have installed the light bulbs included in the kit item in the next 12 months. Specifically, the rate likelihood was scored as follows:

- If you had not received these LED bulbs, how likely would you have been to purchase four or more LED bulbs within the next 12 months?

The likelihood of purchasing was scored as:

- Very Unlikely (0)
- Unlikely (0.25)
- Neither unlikely or likely (0.5)
- Likely (0.75)
- Very likely (1)
- Don't know (0.5)

3.3.2.4.4 *RLA Non-Lighting*

The following free ridership approach was applied to smart thermostat and refrigerators rebated through the RLA. The objective of the free ridership analysis is to estimate the share of program activity would have occurred in the absence of the program. To accomplish this, the Evaluators administered a survey to program participants that contained questions regarding the participants' plans to implement the incentivized measures and the likelihood of implementing those measures in the absence of program incentives and informational support. Program participants were asked questions regarding:

- Whether or not they had plans to complete the project and if they could afford to complete it without the program discount;
- The likelihood of completing the project without the discount or the incentivized assessment;
- The timing of the project in the absence of the program.

3.3.2.4.4.1 Prior Plans

Respondents who indicated that they did not have plans to install the efficient measure or the financial ability to do so were determined to not be free riders. Free ridership scores were developed for the remaining respondents using survey response data on likelihood of completing the efficiency project or installing the efficient equipment and the program's impact on when that would have occurred.

3.3.2.4.4.2 Likelihood of Project Completion

The score reflecting the likelihood of completing the project in the absence of the program was based on the following question: How likely is it that you would have installed the same measure that you completed through the if the rebate was not available?

A score was assigned to each response as follows:

- 1 - Not at all likely (0)
- 2 (0.25)
- 3 (0.5)
- 4 (0.75)
- 5 - Very likely (1)
- Don't know (0.5)

3.3.2.4.4.3 Timing

The Program effect on the timing is assessed with the following two questions:

- Did you purchase the [MEASURE] sooner than expected so you could take advantage of receiving the ENTERGY rebate?
- When might you have purchased the [MEASURE] if you had not participated in the program?

The information provided in response to these questions was used in the following manner:

- If the respondent states that they did not install the measure sooner because of the program or was unsure of the program effect on timing, the likelihood free ridership score was not adjusted (Timing Score was set to 1).
- If the respondent stated that they would have never installed the measure or in more than one year, the free ridership score was multiplied by 0, resulting in a final free ridership score of 0.
- If the respondent stated that they would have installed the measure in 6 months to one year, the free ridership score was multiplied by 0.67.
- If the respondent stated that they would have installed the measure in 1 to 2 years, the preliminary free ridership score was multiplied by 0.33.

3.3.2.4.5 *Multifamily Direct Install Free Ridership Assessment*

The scoring for the multifamily direct install program was similar to RLA Smart Thermostat and Refrigerators, with two notable differences.

Multifamily decisionmakers were asked about all measures received in a single battery of questions. For example, if a decisionmakers' property received weatherization (e.g., duct sealing or air sealing), lighting, and water savings measures, all those items were described and the decision-making for those items was asked about as a collective "measure."

The other difference in scoring was that Multifamily Direct Install respondents were asked two likelihood of installing questions: one pertaining to the incentive and one regarding their facilities' assessment. If the participant had an assessment and did not have prior plans to have an assessment, the likelihood score was based on the multiplication of the following two scores:

- The likelihood of completing the project without the assessment; and
- The likelihood of completing the project without the incentive.

3.3.2.4.6 *Participant Spillover Assessment*

Program participants may implement additional energy saving measures without receiving a program incentive because of their participation in the program. The energy savings resulting from these additional measures constitute program participant spillover effects.

To assess participant spillover savings, survey respondents were asked whether or not they implemented any additional energy saving measures for which they did not receive a program incentive. Respondents that indicated that they had installed additional measures were determined to have spillover savings if follow-up questioning suggested their program participation had influenced and/or been important in their decision to make the additional purchase or installation and sufficient information was collected to assign savings estimates.

3.3.2.5 AR&R

The NTG approach was consistent with the Uniform Methods Protocol (UMP) chapter seven refrigerator recycling protocol. This approach utilizes customer self—report data to estimate what participating customers would have done with the unit in the absence of the program and what would have happened with discarded units (free ridership). The approach also incorporates the secondary market impacts that arise when a would-be buyer of a recycled unit would do given that it was not available. The counterfactual for this approach is not what units would not have been recycled, but instead what units would remain on the grid.

3.3.2.5.1 *Free Ridership*

Free ridership occurs when an appliance recycled through the program would have been taken off the grid even in the absence of the program. The first step of the free ridership analysis was to ask participants if they had considered discarding the program appliance before learning about the program. If the participant indicated no previous consideration of unit disposal, they are categorized as non-free-riders and removed from the subsequent free ridership analysis.

Next, the remaining participants (i.e., those who had previously considered discarding the program appliance) were asked a series of questions to determine the distribution of program appliances that would have been kept within participant households versus those that would have been discarded. If one considers the counterfactual scenario where there is no program intervention, there are essentially three outcomes for participating appliances:

- The appliance would have been kept in use by the participant household.
- The appliance would have been discarded in such a way that it was transferred to another customer for continued use.
- The appliance would have been discarded in such a way that it would be taken out of service.

Of the three outcomes, participants who respond that their appliance would have been discarded and taken out of service is indicative of free ridership. This is because the recycled units would have been removed from the grid even without program intervention.

3.3.2.5.2 *Secondary Market Impacts*

Secondary market impacts refer to the effect the program has on would-be acquirers of program participating units. In the event that a program unit would have been transferred to another customer (sold, gifted, donated), the question then becomes what other appliance acquisition decisions are made by the would-be acquirer of the program unit now that it is decommissioned and unavailable. The would-be acquirer could:

- Not purchase/acquire another unit.
- Purchase/acquire a different non-program used appliance.
- Purchase a new appliance instead.

Ultimately, the true market level outcome in the absence of the program is difficult to assess. As a result, this evaluation took a midpoint approach, as recommended by the UMP protocol. That is, 50% of would-be acquirers of program avoided transfers are assumed to find an alternate unit. The next question of interest is whether the alternative units acquired would be used (similar to those recycled by the program) or new. Again, this market

distribution is difficult to estimate with any certainty. This evaluation took the UMP recommendation and assumed that 50% of the alternative units would be used and 50% would be new, standard efficiency units.

Figure 3-1 summarizes the complete net-to-gross calculation that will be used in the evaluation of the program. Note that this diagram depicts net savings as calculated under the UMP gross savings definition.

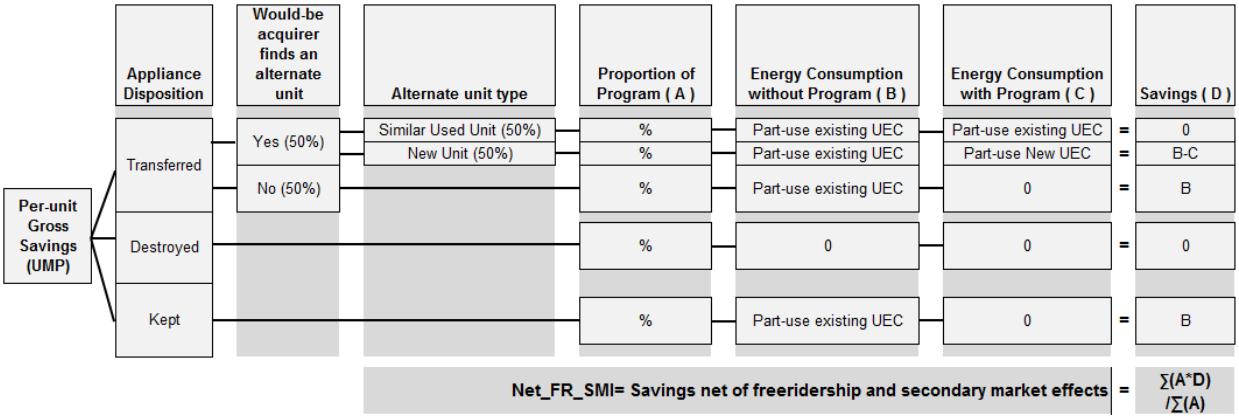


FIGURE 3-1 UMP NET-TO-GROSS CALCULATION METHODOLOGY

3.3.2.5.3 *Appliance Recycling Spillover*

In accordance with the UMP guidance, the Evaluators did not assess spillover for appliance recycling.

3.3.2.6 C&I NC Solutions, PFI, Small C&I Solutions, and Large C&I Solutions

Participant survey responses were used to estimate the net energy impacts for the Small C&I, Large C&I, PFI, NC offerings. The methodology used is described in detail below.

Several criteria were used for determining what portion of a customer's savings for a particular project should be attributed to free-ridership. The first criterion was based on the response to the question: "Would you have been financially able to install energy efficient [Measure/Equipment] at the location without the financial incentive from the Program?" Customers that answer "No" to this question are asked to confirm that they would not have allocated funds to the project without the incentive. If a customer confirms that they would not have allocated the funds if the incentives were not available, the customer was not deemed a free-rider.

For decision makers that indicated that they were able to undertake energy efficiency projects without financial assistance from the program, three factors were analyzed to determine what percentage of savings may be attributed to free-ridership. The three factors were:

- Plans and intentions of firm to install a measure even without support from the program;
- Influence that the program had on the decision to install a measure; and
- A firm's previous experience with a measure installed under the program.

For each of these factors, rules were applied to develop binary variables indicating whether or not a participant's behavior showed free-ridership.

The first factor requires determining if a participant stated that his or her intention was to install an energy efficiency measure even without the program. The answers to a combination of several questions were used

with a set of rules to determine whether a participant's behavior indicates likely free-ridership. Two binary variables were constructed to account for customer plans and intentions: one, based on a more restrictive set of criteria that may describe a high likelihood of free-ridership, and a second, based on a less restrictive set of criteria that may describe a relatively lower likelihood of free-ridership.

The first, more restrictive criteria indicating customer plans and intentions that likely signify free-ridership are as follows (Definition 1):

- The respondent answers "yes" to the following two questions: "Did you have plans to install energy efficient [Measure/Equipment] at the location before deciding to participate in the program?" and "Would you have gone ahead with this planned project if you had not received the rebate through the program?"
- The respondent answers "definitely would have installed" to the following question: "If the rebates from the program had not been available, how likely is it that you would have installed energy efficient [Measure/Equipment] at the location anyway?"
- The respondent answers "no, program did not affect timing of purchase and installation" to the following question: "Did you purchase and install energy efficient [Measure/Equipment] earlier than you otherwise would have without the program?"
- The respondent answers "no, program did not affect level of efficiency chosen for equipment" in response to the following question: "Did you choose equipment that was more energy efficient than you would have chosen had you not participated in the program?"

The second, less restrictive criteria indicating customer plans and intentions that likely signify free-ridership are as follows (Definition 2):

- The respondent answers "yes" to the following two questions: "Did you have plans to install energy efficient [Measure/Equipment] at the location before participating in the program?" and "Would you have gone ahead with this planned installation even if you had not participated in the program?"
- Either the respondent answers "definitely would have installed" or "probably would have installed" to the following question: "If the rebates from the program had not been available, how likely is it that you would have installed energy efficient [Measure/Equipment] at the location anyway?"
- Either the respondent answers "no, program did not affect timing of purchase and installation" to the following question: "Did you purchase and install energy efficient [Measure/Equipment] earlier than you otherwise would have without the program?" or the respondent indicates that while program information and financial incentives did affect the timing of equipment purchase and installation, in the absence of the program they would have purchased and installed the equipment within the next two years.
- The respondent answers "no, program did not affect level of efficiency chosen for equipment" in response to the following question: "Did you choose equipment that was more energy efficient than you would have chosen had you not participated in the program?"

The second factor requires determining if a customer reported that a recommendation from a program representative or past experience with the program was influential in the decision to install a particular piece of equipment or measure.

The criterion indicating that program influence may signify a lower likelihood of free-ridership is that either of the following conditions is true:

- The respondent answers "very important" to the following question: "How important was previous experience with the program in making your decision to install energy efficient [Measure/Equipment] at the location?"
- The respondent answers "probably would not have" or "definitely would not have" to the following question: "If the program representative had not recommended [Measure/Equipment], how likely is it that you would have installed it anyway?"

The third factor requires determining if a participant in the program indicates that he or she had previously installed an energy efficiency measure similar to one that they installed under the program without an energy efficiency program incentive during the last three years. A participant indicating that he or she had installed a similar measure is considered to have a likelihood of free-ridership.

The criteria indicating that previous experience may signify a higher likelihood of free-ridership are as follows:

- The respondent answers "yes" to the following question: "Before participating in the Program, had you installed any equipment or measure similar to energy efficient [Measure/Equipment] at the location?"
- The respondent answers "yes" to the following question: "Has your organization purchased any significant energy efficient equipment in the last three years at the location?" and answered "yes" to the question: "Did you install any of that equipment without applying for a financial incentive through an energy efficiency program?"

The four sets of rules described above were used to construct four different indicator variables that address free-ridership behavior. For each customer, a free-ridership value was assigned based on the combination of variables. With the four indicator variables, there are 11 applicable combinations for assigning free-ridership scores for each respondent, depending on the combination of answers to the questions creating the indicator variables.

Source	Utility	Measure Name	Delivery Mechanism	NTG
PY2022 EM&V Report	SWEPCO AR	Duct Sealing	TA Installed	96.9%
PY2022 EM&V Report	OG&E AR	Duct Sealing	TA Installed	91.9%
MA - 1.3.2023 - eTRM	MASS Saves	Duct Sealing and Insulation	TA Installed	86.0%
2024 Rhode Island TRM	National Grid	Duct Sealing	TA Installed	87.0%
				90.4%

Table 3-30 shows these values.

TABLE 3-36 FREE-RIDERSHIP SCORES FOR COMBINATIONS OF INDICATOR VARIABLE RESPONSES

Indicator Variables				Free-ridership Score
Had Plans and Intentions to Install Measure without Program? (Definition 1)	Had Plans and Intentions to Install Measure without Program? (Definition 2)	Program had influence on Decision to Install Measure?	Had Previous Experience with Measure?	
Y	N/A	Y	Y	100%

Indicator Variables				Free-ridership Score
Had Plans and Intentions to Install Measure without Program? (Definition 1)	Had Plans and Intentions to Install Measure without Program? (Definition 2)	Program had influence on Decision to Install Measure?	Had Previous Experience with Measure?	
Y	N/A	N	N	100%
Y	N/A	N	Y	67%
Y	N/A	Y	N	67%
N	Y	N	Y	67%
N	N	N	Y	33%
N	Y	N	N	33%
N	Y	Y	N	0%
N	N	N	N	0%
N	N	Y	N	0%
N	N	Y	Y	0%

3.3.2.6.1 *Spillover Assessment*

Program participants may implement additional energy saving measures without receiving a program incentive because of their participation in the program. The energy savings resulting from these additional measures constitute program participant spillover effects.

To assess participant spillover savings, survey respondents were asked whether or not they implemented any additional energy saving measures for which they did not receive a program incentive. Respondents that indicated that they had installed additional measures were determined to have spillover savings if follow-up questioning suggested their program participation had been important in their decision to make the additional purchase or installation and sufficient information was collected to assign savings estimates.

3.3.2.7 Online Marketplace

Information collected through a survey of a sample of program participants was used for the net-to-gross analysis for the online marketplace measures. The approach taken for each of the measure types is presented below.

3.3.2.7.1 *Smart Thermostat*

The criteria indicating customer had plans and intentions that likely signify free-ridership are as follows:

- FR1: “Did you plan to purchase smart thermostats before learning you could get a [free/discounted] smart thermostat from the Energy Smart Business Store?”
- FR2: [IF YES] “Just to be clear, did you have plans to purchase a smart thermostat as opposed to a programmable or non-programmable thermostat?”

If respondent answered “no” to FR1 or “yes” to FR1 and then “yes” to FR2, they were not considered to have plans or intentions.

Participants were asked about the direct influence of the program on their decision to purchase the measures. Specifically, participants were asked:

- FR3: “How likely is that you would have purchased the same smart thermostat(s) in the next 12 months if you had not received a [free/discounted] thermostat from the Energy Smart Business Store?”

A program influence score was developed based on this response in the following manner:

Program Influence = FR3 / 10

Respondents who were found to not have plans or the financial ability to purchase the measures were deemed to not be free-riders. If respondent had plans, their free-ridership score equals their program influence score.

3.3.2.7.2 *LED Lamp*

The criteria indicating customer had plans and intentions that likely signify free-ridership are as follows:

- FR1: Did you have any LED light bulbs installed at your organization before learning about the discount from the Energy Smart Small Business Store?
- FR2: Prior to receiving LED light bulb(s) from the Energy Smart Business Store, had your organization purchased any LED bulbs within the last three years?
- FR3: Before learning about the Energy Smart Business Store discounts, did you have plans to purchase LED light bulb(s) for your organization?

If respondent answered “no” to FR1, “no” to FR2 or “no” to FR3, they were not considered to have plans or intentions.

Participants were asked about the direct influence of the program on their decision to purchase the measures. Specifically, participants were asked:

- FR4: If you had not received the discount through the Energy Smart Small Business Store, how many LED light bulb(s)would you have purchased within the next 12 months?
- FR5: How likely would you have been to purchase [Field-LED_Quant] LED light bulb(s) within the next 12 months, if you did not receive the discounted bulbs?

A program influence score was developed based on this response in the following manner: Program Influence = FR5 / 10

Respondents who were found to not have plans to purchase the measures were deemed to not be free-riders. If respondent had plans, their free-ridership score equals their program influence score.

3.3.2.7.3 *LED Exit Sign Retrofit Kit*

The criteria indicating customer had plans and intentions that likely signify free-ridership are as follows:

- FRI: Did you have any LED exit sign(s) installed at your organization before learning about the discount from the Energy Smart Small Business Store?
- FR2: Did you plan to purchase LED exit sign(s) before learning about the discount from the Energy Smart Small Business Store?

If respondent answered “no” to FR1 or “no” to FR2, they were not considered to have plans or intentions.

Participants were asked about the direct influence of the program on their decision to purchase the measures. Specifically, participants were asked:

- FR3: How likely would you have been to purchase [Field-Exit_Quant] LED exit sign(s) within the next 12 months, if you did not receive the discount from the Energy Smart Small Business Store?

A program influence score was developed based on this response in the following manner:

Program Influence = FR3 / 10

Respondents who were found to not have plans to purchase the measures were deemed to not be free-riders. If respondent had plans, their free-ridership score equals their program influence score.

3.3.2.7.4 *Low-Flow Showerhead*

The criteria indicating customer had plans and intentions that likely signify free-ridership are as follows:

- FR1: Did you have any low-flow showerheads installed at your organization before learning about the discount from the Energy Smart Small Business Store?
- FR2: Had you heard of low-flow showerhead before you purchased from the Energy Smart Small Business Store
- FR3: Did you plan to purchase low-flow showerheads before learning about the discount from the Energy Smart Small Business Store?

If respondent answered “no” to FR1, “no” to FR2 or “no” to FR3, they were not considered to have plans or intentions.

Participants were asked about the direct influence of the program on their decision to purchase the measures. Specifically, participants were asked:

- FR4: "How many low-flow showerheads do you think you would have purchased in the next 12 months if you had not received a discount through the Energy Smart business store?”
- FR5: "How likely would you have been to purchase [Field-Shower Quant] low-flow showerheads within the next 12 months, if you did not receive the discount from the Energy Smart Small Business Store?

A program influence score was developed based on this response in the following manner:

Program Influence = FR5 / 10

Respondents who were found to not have plans to purchase the measures were deemed to not be free-riders. If respondent had plans, their free-ridership score equals their program influence score.

3.3.2.7.5 *Aerator*

The criteria indicating customer had plans and intentions that likely signify free-ridership are as follows:

- FR1: Did you have any low-flow sink aerators installed at your organization before learning about the discount from the Energy Smart Small Business Store?
- FR2: Had you heard of low-flow sink aerators before you purchased from the Energy Smart Small Business Store
- FR3: Did you plan to purchase low-flow aerators before learning about the discount from the Energy Smart Small Business Store?

If respondent answered “no” to FR1, “no” to FR2 or “no” to FR3, they were not considered to have plans or intentions.

Participants were asked about the direct influence of the program on their decision to purchase the measures. Specifically, participants were asked:

- FR4: "How many low-flow aerators do you think you would have purchased in the next 12 months if you had not received a discount through the Energy Smart business store?”
- FR5: "How likely would you have been to purchase [Field-Shower Quant] low-flow aerators within the next 12 months, if you did not receive the discount from the Energy Smart Small Business Store?

A program influence score was developed based on this response in the following manner:

Program Influence = FR5 / 10

Respondents who were found to not have plans to purchase the measures were deemed to not be free-riders. If respondent had plans, their free-ridership score equals their program influence score.

3.3.2.7.6 *Advanced Power Strip*

The criteria indicating customer had plans and intentions that likely signify free-ridership are as follows:

- FR1: Were you using any Tier 1 Advanced Power Strips at your organization before you received one from ENO?
- FR2: Had you heard of Tier 1 Advanced Power Strips before learning about the discount from the Energy Smart Small Business Store?
- FR3: Did you have plans to purchase Tier 1 Advanced Power Strips before you learned about the discount from the Energy Smart Small Business Store?
- FR4: Just to be clear, did you have plans to purchase a Tier 1 Advanced Power Strips that manages energy use instead of a standard power strip that does not manage energy use?

If respondent answered “no” to FR1, “no” to FR2 or “no” to FR3, they were not considered to have plans or intentions. If respondent answered “yes to FR3 and then “no” to FR4, they were not considered to have plans or intentions.

Participants were asked about the direct influence of the program on their decision to purchase the measures. Specifically, participants were asked:

- FR5: How likely is that you would have purchased [Field-APS Quant] Tier 1 Advanced Power Strip(s) in the next 12 months if you had not received a discount from the Energy Smart Business Store?

A program influence score was developed based on this response in the following manner:

Program Influence = FR5 / 10

Respondents who were found to not have plans to purchase the measures were deemed to not be free-riders. If respondent had plans, their free-ridership score equals their program influence score.

3.3.2.8 NTG Ratios to be Applied

The table below outlines the NTG values for residential programs by measure. SK&E and IQW have a NTG ratio of 100%.

TABLE 3-37 RESIDENTIAL MEASURE-LEVEL NTG VALUES

Program	Measure	NO TRM V6.1 NTG	PY13 Survey NTG	PY13 Lit Review NTG	PY12 (2022) NTG	PY13 NTG
A/C Solutions	AC Replacement	NA	NA	80.9%	72.3%	76.6%
A/C Solutions	AC Tune-up	82.0%	NA	NA	94.5%	88.3%
A/C Solutions	Duct Sealing	95.0%	NA	90.4%	85.5%	90.3%
A/C Solutions	Ductless Heat Pump	NA	NA	NA	102.1%	102.1%
A/C Solutions	Smart Thermostat	NA	NA	NA	102.1%	102.1%
AR&R	Freezer Recycling	NA	NA	48.0%	65.0%	56.5%
AR&R	Refrigerator Recycling	NA	NA	48.0%	54.0%	51.0%
AR&R	Refrigerator Replacement	44.0%	NA	100.0%	100.0%	81.3%
HPwES	Smart Thermostat	NA	95.2%	NA	94.7%	94.9%
HPwES	Water Heater Pipe Insulation	NA	NA	NA	100.9%	100.9%
HPwES	Low-Flow Showerhead	NA	100.0%	91.8%	86.0%	92.6%
HPwES	LED Lamp (Direct Install)	62.0%	58.2%	NA	39.0%	61.2%
HPwES	Aerator	NA	95.9%	91.5%	100.9%	96.1%
HPwES	Pull Kit - Low-Flow Showerhead	NA	100.0%	71.5%	100.9%	90.8%
HPwES	Pull Kit - LED Lamp	NA	86.0%	71.5%	65.0%	74.2%
HPwES	Pull Kit - Aerator	NA	95.9%	71.5%	102.8%	90.1%
HPwES	Duct Sealing	95.0%	95.2%	NA	100.0%	96.7%
HPwES	Attic Insulation	NA	95.2%	NA	100.9%	98.1%
HPwES	Air Infiltration	95.0%	95.2%	NA	100.9%	97.0%
HPwES	Advanced Power Strip (Tier 2)	80.0%	NA	NA	97.7%	88.8%
HPwES	Push Kit - LED Lamp (x3)	NA	86.0%	44.7%	39.0%	56.6%
HPwES	Assessment	100.0%	NA	NA	100.0%	100.0%
MF Solutions	Smart Thermostat	NA	66.0%	NA	100.0%	83.0%
MF Solutions	Water Heater Pipe Insulation	NA	66.0%	NA	100.0%	83.0%
MF Solutions	Low-Flow Showerhead	NA	66.0%	NA	100.0%	83.0%
MF Solutions	LED Lamp (Direct Install)	62.0%	66.0%	NA	100.0%	76.0%
MF Solutions	Aerator	NA	66.0%	91.5%	75.0%	77.5%
MF Solutions	Duct Sealing	95.0%	66.0%	NA	95.0%	85.3%
MF Solutions	Attic Insulation	NA	66.0%	NA	95.0%	80.5%
MF Solutions	Air Infiltration	95.0%	66.0%	NA	95.0%	85.3%
MF Solutions	Advanced Power Strip (Tier 2)	80.0%	66.0%	NA	100.0%	82.0%
RLA	LED Lamp (OLM)	NA	NA	NA	74.0%	80.5%
RLA	LED Lamp (Upstream Rebate)	NA	NA	NA	61.1%	68.9%
RLA	Smart Thermostat	NA	86.5%	80.1%	89.0%	85.2%
RLA	Pool Pump	NA	NA	NA	100.0%	100.0%
RLA	Low-Flow Showerhead	NA	NA	NA	94.0%	94.0%
RLA	Refrigerator Replacement	NA	86.6%	100.0%	29.0%	71.9%
RLA	Advanced Power Strip (Tier 1)	80.0%	NA	91.7%	72.0%	81.2%
RLA	Heat Pump Water Heater	NA	NA	76.5%	74.3%	75.4%

RLA	Window Air Conditioner	60.0%	NA	81.3%	73.0%	71.4%
RLA	Aerator	NA	NA	NA	92.0%	92.0%
RLA	Water Heater Pipe Insulation	NA	NA	80.5%	88.0%	84.3%
RLA	Air Purifier	NA	NA	73.9%	73.0%	73.4%
RLA	Dehumidifier	NA	NA	NA	100.0%	100.0%
RLA	Advanced Power Strip (Tier 2)	80.0%	NA	91.7%	72.0%	81.2%
RLA	Freezer Replacement	NA	NA	100.0%	29.0%	64.5%

For the commercial programs, surveys were performed to estimate NTG. The NTG for Small C&I Solutions is 100%, Large C&I Solutions is estimated at 96%, PFI NTG is 91% and C&I NC Solutions is estimated at 54%.

3.4 Process Evaluation

3.4.1 APPROACH

The Evaluator's general approach to process evaluation begins with a review of the tests for timing and appropriateness of process evaluation. In this review, the Evaluators determined what aspects of the program warrant a process evaluation.

In general, process evaluations assess organizational and procedural aspects of programs to provide feedback on features of programs that are functioning well and contribute recommendations when areas of improvement are identified. These evaluations are based on criteria that justify conducting a process evaluation. Table 3-38 provides details on those criteria that should be met prior to proceeding with a process evaluation.

TABLE 3-38 GENERAL OVERVIEW OF PROCESS EVALUATION GUIDANCE

PROCESS EVALUATION GUIDANCE
Process evaluation required if: ▪ Program is new. ▪ No process evaluation has been undertaken during current funding cycle.
Process evaluation potentially needed if: ▪ Program impacts are lower than expected. ▪ Goals (both informational and educational) are not being achieved. ▪ Rates of participation are lower/slower than expected. ▪ Program operational system is slow to get up and running. ▪ Cost-effectiveness of the program is less than expected. ▪ Participants (both customers and market actors) report problems/low rates of satisfaction with program.

A process evaluation is a culmination of information from a variety of sources, including program staff, trade allies, and program participants (collectively referred to as market actors). To increase the validity of the findings, the Evaluators gathered data from multiple sources and then "triangulated" the data to compare it across multiple groups. This methodology increases the overall validity of the findings.

It should also address a variety of issues, including:

- Help program designers and managers structure programs to achieve cost-effective savings while maintaining high levels of customer satisfaction;
- Determine program awareness levels to refine marketing strategies and reduce barriers to program participation;
- Provide recommendations for changing the program's structure, management, administration, design, delivery, operations, or target;
- Test for use of best practices and determine what best practices should be incorporated; and
- Gather data from a variety of sources to minimize bias in the findings.

TABLE 3-39 KEY PROCESS EVALUATION ACTIVITIES

	Process Evaluation Activity					
Key Researchable Issues	**Materials Review**	**Database Review**	**Staff Interview**	**Part. Customer Survey**	**Near Participant Market Actor Interviews**	**Non-Participant Market Actor Focus Groups**
Program Effectiveness	✓		✓	✓		
Tracking Systems		✓	✓			
Rebate Application Processing		✓	✓			
Trade ally Reporting/ Tracking		✓	✓			
Overall Program Satisfaction				✓		
Satisfaction with Trade allies			✓	✓		
Satisfaction with Utility				✓		
Satisfaction with Implementer			✓			
Market Effects	✓		✓	✓		
Changes in Stocking Practices			✓			
Barriers to Participation			✓	✓	✓	✓
Awareness Levels				✓	✓	✓
Reasons for Participation				✓		
Reasons for Non-Participation					✓	✓

The process evaluation for PY13 consists of a multiple step process that is outlined in the following section.

3.4.2 REVIEW OF PROGRAM MATERIALS

The Evaluators reviewed reports and supporting materials for clarity and consistency with program objectives. As an initial step in the PY13 process evaluation, the Evaluators reviewed available program documents such as

delivery schedules, sample reports and samples of any additional engagement materials. The purpose of reviewing these materials is to understand what information is communicated to participants, how it is communicated, and to identify any gaps or opportunities for improvement.

3.4.3 PROGRAM STAFF AND IMPLEMENTER INTERVIEWS

The program staff in-depth interviews were conducted via telephone and addressed the key process evaluation objectives discussed previously. The initial evaluation interviews focus on the program history, design, and identifying areas for improvement, while the subsequent process evaluation interviews focused on "lessons learned" and the overall effectiveness of the program. These interviews are open-ended, in that there is a discussion guide, but responses will not be limited to a specific set of choices. Moreover, all respondents are promised confidentiality throughout the interview process to assure that these findings truly reflect program operations and activities. The results of these interviews were summarized for each program. Overall themes from these interviews are summarized for the entire portfolio.

The third-party implementer interviews were conducted by telephone. Particular attention was paid to the program implementers' perceptions of how the programs operate, what program data are tracked and captured, how that data are managed and maintained, and how the programs are promoted to motivate trade allies and customers.

3.4.4 PARTICIPANT SURVEYS

The Evaluators conducted surveys across the residential and commercial energy efficiency programs. These surveys focused on program awareness, participants' decision-making process, program operations, customer satisfaction with eligible measures, and satisfaction with the program. These surveys also included questions to verify measure installations and collected other data necessary to support the impact evaluation. Survey summaries can be found in each program chapter.

3.4.5 NEAR-PARTCIPANT TRADE ALLY INTERVIEWS & NON-PARTICIPANT TRADE ALLY FOCUS GROUPS

The Evaluators conducted near participant trade ally interviews and non-participant trade ally focus groups. The specifics of these trade ally activities are described more fully in the subsequent program chapters. These interviews focused on identifying levels of program awareness, interest in program engagement, and challenges to program participation. areas of program effectiveness, overall satisfaction, and identifying barriers to program participation. The results from these interviews are summarized at the program and portfolio level.

3.5 Cost-Effectiveness Evaluation

See Appendix B: Cost-Effectiveness Analysis for additional details on this approach. The results by each program and the portfolio for cost test is shown in the table below.

TABLE 3-40 PY13 COST-EFFECTIVENESS RESULTS

Program	TRC	UCT	RIM	PCT	SCT
HPwES	1.18	0.98	0.31	4.71	1.37
RLA	0.69	0.82	0.27	2.96	0.74
MF Solutions	1.35	1.46	0.38	3.96	1.71
IQW	1.26	1.37	0.45	2.90	1.64
A/C Solutions	1.91	1.98	0.47	4.59	2.38
SK&E	0.70	0.68	0.25	6.08	0.79
AR&R	0.09	0.09	0.07	1.73	0.11
Behavioral	0.73	0.73	0.32	NA	0.73
EasyCool (BYOT)	0.63	0.45	0.45	0.00	0.63
PTR Pilot	0.08	0.07	0.07	NA	0.08
BESS Pilot	0.12	0.11	0.11	NA	0.12
Small C&I Solutions	1.37	1.54	0.31	5.98	1.68
Large C&I Solutions	1.70	1.92	0.35	7.09	2.12
PFI	0.96	0.93	0.28	8.28	1.19
C&I NC Solutions	0.13	0.13	0.10	5.36	0.16
Large C&I DR	0.67	0.44	0.43	NA	0.67
EV Charging Pilot	0.04	0.04	0.04	NA	0.04
Total	**1.23**	**1.26**	**0.35**	**5.16**	**1.51**

The portfolio and most programs pass the TRC and the UCT, with the exception of RLA, SK&E, AR&R, Behavioral, EasyCool BYOT, PTR pilot, BESS pilot, PFI, C&I NC Solutions, Large C&I DR and the EV Charging pilot. The portfolio has $4,770,419 in TRC net benefits and is cost-effective.

The details of each program evaluation are found in the sections below.

4 HOME PERFORMANCE WITH ENERGY STAR®

4.1 Summary

The tables below report *ex ante* gross, *ex post* gross, *ex post* net energy savings (kWh) (both annual and lifetime), demand reductions (kW), participation, and incentive spend, by measure, where applicable.

TABLE 4-1 PY13 HPWES ENERGY SAVINGS (KWH)

Measure	*Ex Ante* Gross Energy Savings (kWh)	Realization Rate (kWh)	*Ex Post* Gross Energy Savings (kWh)	NTG	*Ex Post* Net Energy Savings (kWh)
Advanced Power Strip (Tier 2)	255,935	86.2%	220,590	88.8%	195,945
Air Infiltration	397,559	87.8%	349,107	97.0%	338,761
Assessment	0	100.0%	0	100.0%	0
Attic Insulation	41,490	99.8%	41,427	98.1%	40,621
Bathroom Aerator	2,501	89.0%	2,226	96.1%	2,140
Duct Sealing	803,458	108.6%	872,593	96.7%	844,034
Kitchen Aerator	1,286	89.0%	1,145	96.1%	1,100
LED Lamp 11W (A Type)	8,854	110.3%	9,764	61.2%	5,973
LED Lamp 11W (Flood)	42,506	111.4%	47,347	61.2%	28,965
LED Lamp 15W (Outdoor/A Type)	8,975	89.9%	8,068	61.2%	4,936
LED Lamp 15W (Outdoor/PAR38)	70,171	90.9%	63,754	61.2%	39,002
LED Lamp 5W (Candelabra)	50,385	107.0%	53,920	61.2%	32,986
LED Lamp 6W (Globe)	7,331	103.1%	7,559	61.2%	4,624
LED Lamp 8W (Flood)	3,862	103.3%	3,990	61.2%	2,441
LED Lamp 9W (A Type)	68,603	106.1%	72,791	61.2%	44,530
Low-Flow Showerhead	17,328	99.7%	17,270	92.6%	15,990
Pipe Wrap	5,433	92.3%	5,015	100.9%	5,060
Pull Kit - Bathroom Aerator	17,338	95.0%	16,473	92.7%	15,269
Pull Kit - Kitchen Aerator	10,309	95.9%	9,884	92.7%	9,161
Pull Kit - LED Lamp 15W (A Type)	48,891	99.6%	48,705	76.8%	37,388
Pull Kit - LED Lamp 9W (A Type)	87,628	99.5%	87,156	76.8%	66,905
Pull Kit - Low-Flow Showerhead	122,461	76.6%	93,772	93.4%	87,579
Push Kit - LED Lamp 13W (A Type)	4,474,923	95.9%	4,292,688	56.6%	2,428,299
Push Kit - LED Lamp Kit 15W (PAR38)	8,343,790	95.9%	8,003,317	56.6%	4,527,338
Push Kit - LED Lamp Kit 9W (A Type)	2,364,857	95.9%	2,268,575	56.6%	1,283,294
Smart Thermostat	46,991	99.5%	46,774	94.9%	44,402
Total	**17,302,866**	**96.2%**	**16,643,910**	**60.7%**	**10,106,743**

Sums may differ due to rounding.

TABLE 4-2 PY13 HPWES DEMAND REDUCTIONS (KW)

Measure	*Ex Ante* Gross Demand Reductions (kW)	Realization Rate (kW)	*Ex Post* Gross Demand Reductions (kW)	NTG	*Ex Post* Net Demand Reductions (kW)
Advanced Power Strip (Tier 2)	26.43	86.2%	22.78	88.8%	20.23
Air Infiltration	166.07	88.0%	146.12	97.0%	141.79
Assessment	0.00	100.0%	0.00	100.0%	0.00
Attic Insulation	67.33	99.8%	67.23	98.1%	65.92
Bathroom Aerator	0.26	89.9%	0.23	96.1%	0.22
Duct Sealing	298.66	108.0%	322.49	96.7%	311.94
Kitchen Aerator	0.13	88.6%	0.12	96.1%	0.11
LED Lamp 11W (A Type)	1.49	107.2%	1.60	61.2%	0.98
LED Lamp 11W (Flood)	7.07	110.3%	7.80	61.2%	4.77
LED Lamp 15W (Outdoor/A Type)	0.00	100.0%	0.00	61.2%	0.00
LED Lamp 15W (Outdoor/PAR38)	0.00	100.0%	0.00	61.2%	0.00
LED Lamp 5W (Candelabra)	8.45	103.9%	8.77	61.2%	5.37
LED Lamp 6W (Globe)	1.23	103.6%	1.27	61.2%	0.78
LED Lamp 8W (Flood)	0.71	105.0%	0.75	61.2%	0.46
LED Lamp 9W (A Type)	11.51	104.8%	12.06	61.2%	7.38
Low-Flow Showerhead	1.80	99.7%	1.80	92.6%	1.66
Pipe Wrap	0.62	92.3%	0.57	100.9%	0.58
Pull Kit - Bathroom Aerator	0.00	100.0%	1.71	92.7%	1.59
Pull Kit - Kitchen Aerator	0.00	100.0%	1.03	92.7%	0.95
Pull Kit - LED Lamp 15W (A Type)	8.28	99.9%	8.27	76.8%	6.35
Pull Kit - LED Lamp 9W (A Type)	15.00	98.7%	14.80	76.8%	11.36
Pull Kit - Low-Flow Showerhead	0.00	100.0%	9.75	93.4%	9.11
Push Kit - LED Lamp 13W (A Type)	0.00	100.0%	0.00	56.6%	0.00
Push Kit - LED Lamp Kit 15W (PAR38)	0.00	100.0%	0.00	56.6%	0.00
Push Kit - LED Lamp Kit 9W (A Type)	400.74	96.2%	385.33	56.6%	217.97
Smart Thermostat	0.00	100.0%	0.00	94.9%	0.00
Total	**1,015.77**	**99.9%**	**1,014.48**	**60.7%**	**809.52**

Sums may differ due to rounding.

TABLE 4-3 PY13 HPWES LIFETIME SAVINGS SUMMARY

Measure	EUL	*Ex Post* Gross Lifetime Energy Savings (kWh)	*Ex Post* Net Lifetime Energy Savings (kWh)
Advanced Power Strip (Tier 2)	10	2,205,905	1,959,448
Air Infiltration	11	3,840,174	3,726,370
Assessment	1	0	0
Attic Insulation	20	828,541	812,424
Bathroom Aerator	10	22,260	21,398
Duct Sealing	18	15,706,671	15,192,611
Kitchen Aerator	10	11,448	11,005
LED Lamp 11W (A Type)	3	24,409	14,932
LED Lamp 11W (Flood)	3	118,368	72,412
LED Lamp 15W (Outdoor/A Type)	3	20,170	12,339
LED Lamp 15W (Outdoor/PAR38)	3	159,384	97,504
LED Lamp 5W (Candelabra)	3	134,799	82,464
LED Lamp 6W (Globe)	3	18,898	11,561
LED Lamp 8W (Flood)	3	9,975	6,102
LED Lamp 9W (A Type)	3	181,977	111,325
Low-Flow Showerhead	10	172,704	159,900
Pipe Wrap	13	65,194	65,784
Pull Kit - Bathroom Aerator	10	164,727	152,691
Pull Kit - Kitchen Aerator	10	98,836	91,615
Pull Kit - LED Lamp 15W (A Type)	2	121,763	93,470
Pull Kit - LED Lamp 9W (A Type)	3	217,891	167,262
Pull Kit - Low-Flow Showerhead	10	937,721	875,792
Push Kit - LED Lamp 13W (A Type)	3	10,731,721	6,070,748
Push Kit - LED Lamp Kit 15W (PAR38)	2	20,008,293	11,318,345
Push Kit - LED Lamp Kit 9W (A Type)	2	5,671,439	3,208,235
Smart Thermostat	11	514,511	488,424
Total	**4**	**61,987,778**	**44,824,162**

Sums may differ due to rounding.

TABLE 4-4 PY13 HPWES COUNT OF MEASURES AND INCENTIVE SPEND

Measure	Participation (Count of Measures)	Incentive Spend ($)
Advanced Power Strip (Tier 2)	844	$42,200
Air Infiltration	257	$122,565
Assessment	808	$133,320
Attic Insulation	18	$12,016
Bathroom Aerator	57	$342
Duct Sealing	368	$127,442
Kitchen Aerator	49	$343
LED Lamp 11W (A Type)	272	$2,176
LED Lamp 11W (Flood)	1,034	$8,272
LED Lamp 15W (Outdoor/A Type)	37	$481
LED Lamp 15W (Outdoor/PAR38)	303	$3,939
LED Lamp 5W (Candelabra)	1,795	$12,565
LED Lamp 6W (Globe)	268	$1,876
LED Lamp 8W (Flood)	94	$752
LED Lamp 9W (A Type)	2,540	$15,240
Low-Flow Showerhead	81	$1,275
Pipe Wrap	53	$400
Pull Kit - Bathroom Aerator	1,562	$2,187
Pull Kit - Kitchen Aerator	1,562	$3,515
Pull Kit - LED Lamp 15W (A Type)	1,562	$8,982
Pull Kit - LED Lamp 9W (A Type)	4,686	$20,150
Pull Kit - Low-Flow Showerhead	1,562	$12,027
Push Kit - LED Lamp 13W (A Type)	24,737	$123,685
Push Kit - LED Lamp Kit 15W (PAR38)	49,474	$235,002
Push Kit - LED Lamp Kit 9W (A Type)	123,685	$531,846
Smart Thermostat	137	$23,975
Total	**217,845**	**$1,446,570**

Sums may differ due to rounding.

4.2 Program Description

The HPwES is designed to achieve long-term, significantly cost-effective electric savings through the use of local auditors and trade allies who help residential customers analyze their energy use and identify opportunities to improve efficiency, install low-cost energy-saving measures, and identify and implement more comprehensive home efficiency projects. The program is implemented by Franklin, who helps oversee HPwES as well as additional residential programs. HPwES offers three levels of home energy audits. The Level I Assessment includes a “walk-through” inspection and direct installation of low-cost measures, such as LED lamps and water conservation measures. To generate additional savings at the time of the audit, demand response-enabled smart thermostats were added as a direct install measure. The Level II and III Assessments are comprehensive home inspections with diagnostic testing, performed by a qualified trade ally, targeted to achieve deeper savings within the home.

To meet the needs of New Orleans' unique housing stock of double shot-gun homes and smaller multifamily configurations, the program also offers HPwES incentives to buildings with four or fewer units. These types of homes often function more like single-family homes, with owners occupying one of the units, thus minimizing the split-incentive barrier.

4.2.1 PROGRAM DELIVERY CHANNELS AND EXPECTED SAVINGS

A total of 26,983 distinct households participated in PY13. Participation included:

- 807 distinct homes receiving traditional assessments;
- 474 distinct homes receiving major measures;
- 758 distinct homes receiving direct install measures;
- 1,562 distinct homes receiving Home Energy Savings Kit (HESK); and
- 24,735 homes receiving Light-the-Night Kit (LTN Kit).

4.2.1.1 Home Energy Savings Kit (HESK)

A total of Home Energy Savings Kits (HESK – also referred as 'pull kits') 1,562 kits were distributed to residences through orders from the Online Marketplace (OLM). Kits were free of charge and included the following items:

- (3) 9W A-Type LED;
- (1) 15W A-Type LED;
- (1) 1.5 GPM Kitchen Aerator;
- (1) 1.0 GPM Bathroom Aerator;
- (1) 1.5 GPM Showerhead;
- Literature on included measures; and
- ENERGY STAR promotional materials.

Expected and verified savings from the HESK are presented in the sections below.

4.2.1.2 Light the Night Kit (LTN Kit)

In PY13, the LTN kits (also referred as 'push kits') were distributed to ENO customers that have the following characteristics:

- Customers who have not been served by a DI program (HPwES or IQW)
- Customers who have not requested a traditional kit
- Customers in neighborhoods with higher crime levels

The campaign premise is to "Light up the Night" and help people illuminate their porches and yards to help deter illegal/inappropriate behavior. A total of LTN 24,737 kits were distributed to residences through orders from the OLM. Kits were free of charge and included the following items:

- (5) 9W A-Type LED;
- (1) 15W A-Type LED;
- (2) 15W PAR38 LED;
- Literature on included measures; and
- Energy Smart promotional materials.

Expected and verified savings from the LTN Kits are presented in the sections below.

4.2.1.3 Direct Install and Major Measures

Below,

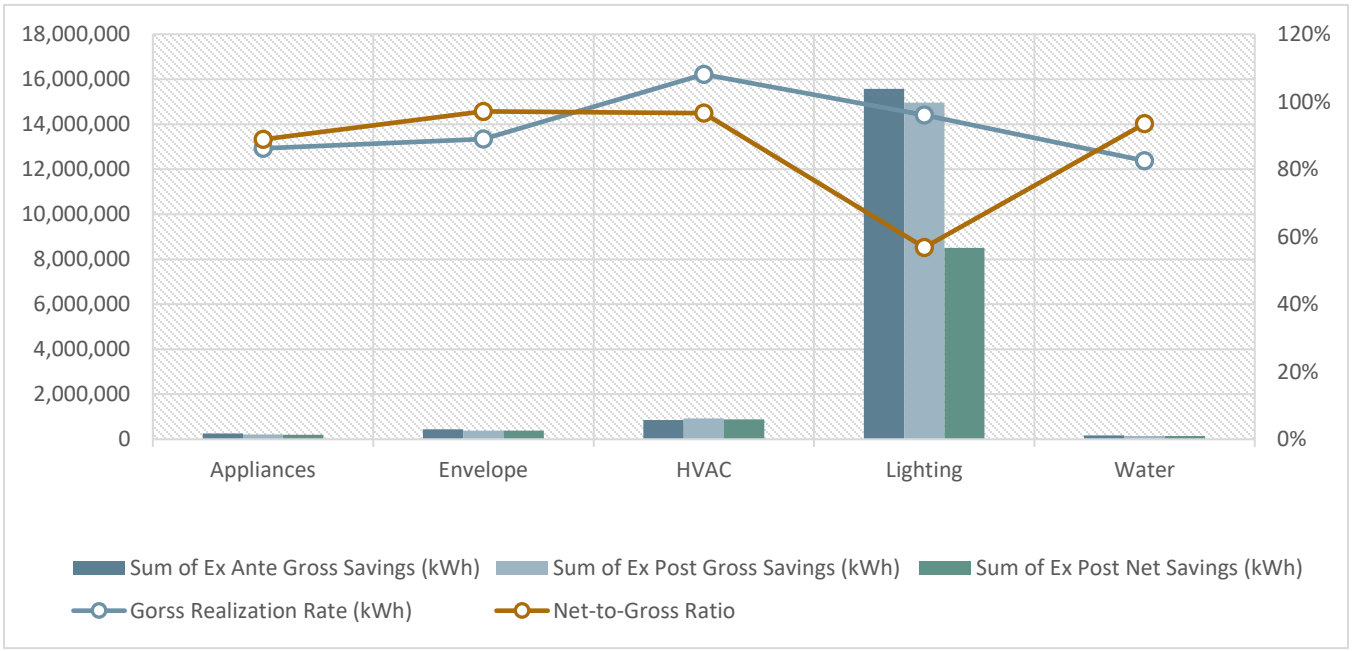


Figure 4-1 illustrates and compares the differences in energy savings (kWh) contributions by each measure.

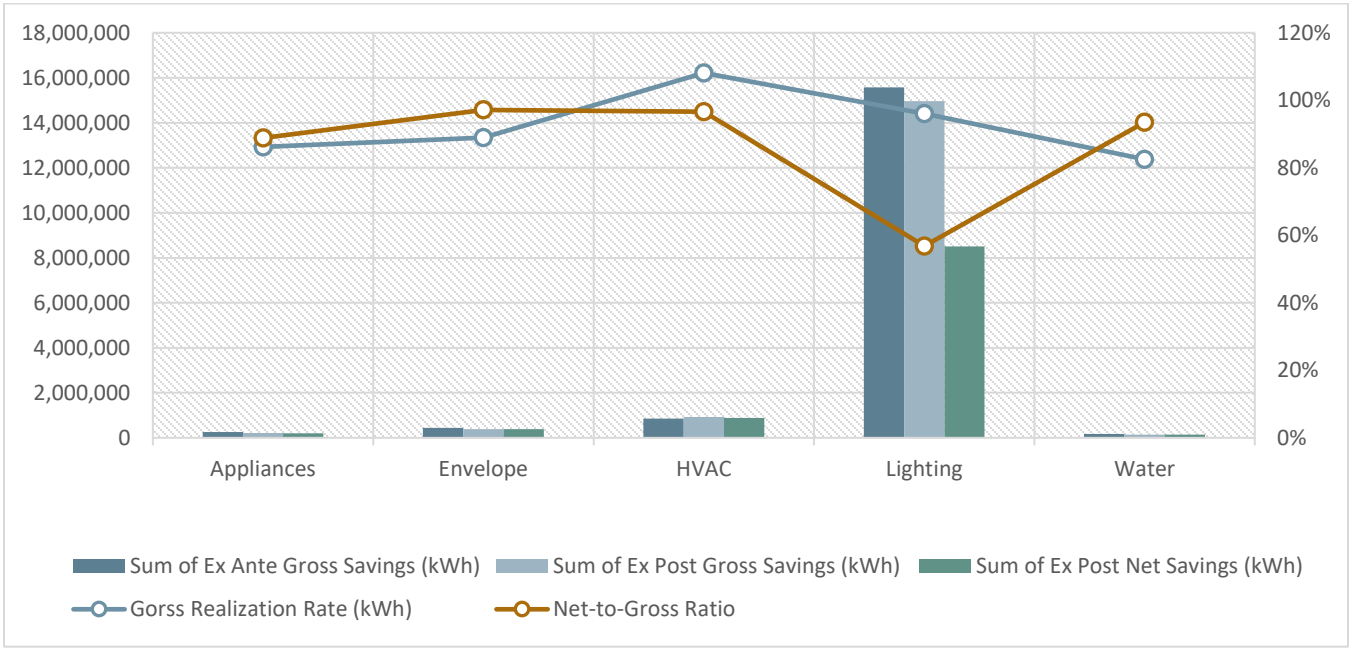


FIGURE 4-1 HPWES CONTRIBUTION TO SAVINGS BY END USE

In PY13, the HVAC measures (smart thermostat and duct sealing) contributed 40.1% of expected energy (kWh) savings (compared to 24.7% in PY13), the envelope measures (air infiltration and attic insulation) contributed 20.7% (compared to 9.5% in PY13) the lighting measures (LED lamp) contributed 18.7% (compared to 52.9% in

PY13), the appliance measures (advanced power strip) contributed 12.1% (compared to 9.1% in PY13), and finally, the hot water measures (pipe wrap, aerator, showerhead) contributed 8.3% (compared to 3.8% of expected energy savings in PY13). The bulk of PY13 energy savings come from the duct sealing, air infiltration, and LED lamp projects.

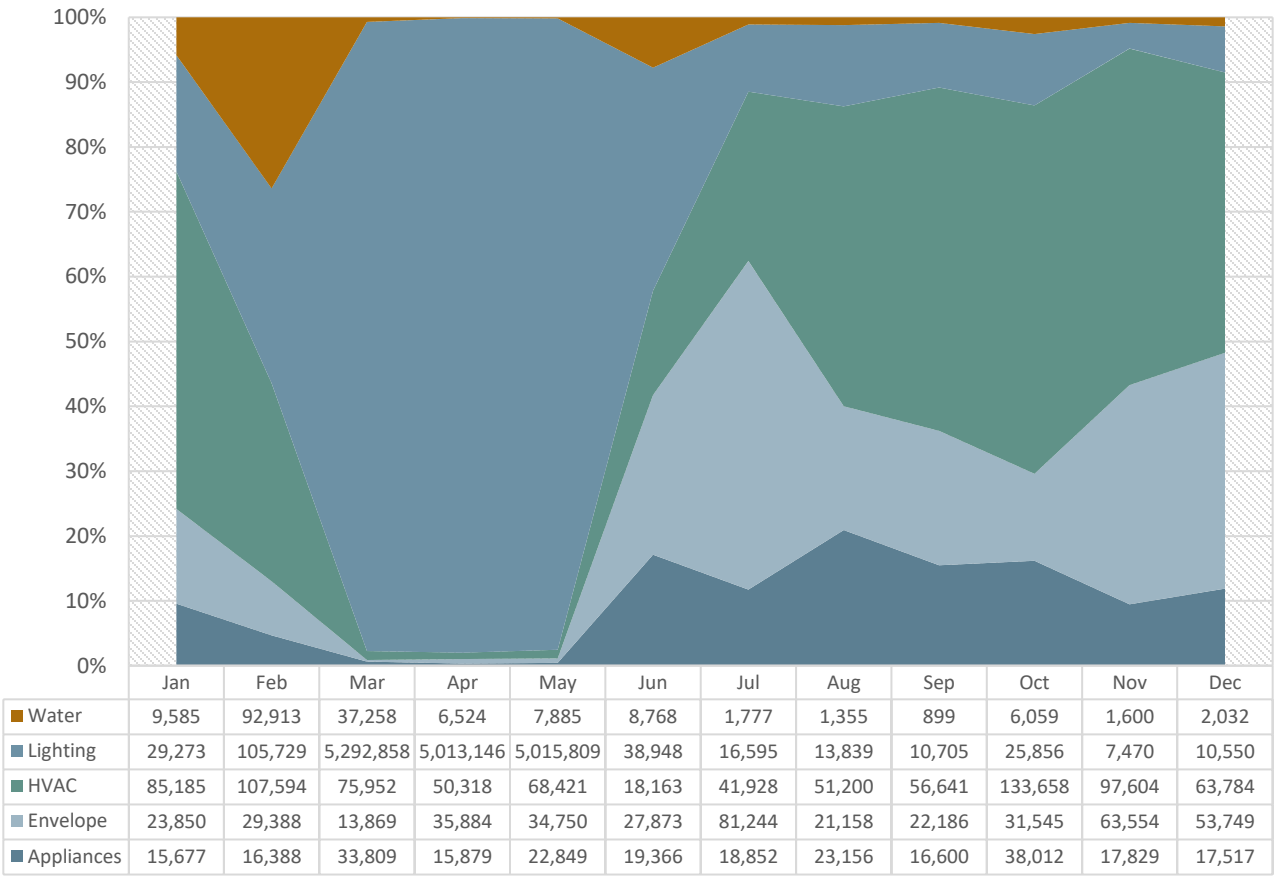
Additionally, there were a total of 997 distinct non-kit homes accounting for 1,832,668 kWh of non-kit expected savings. The non-kit expected savings accounts for a 30.8% increase in expected savings, compared to the PY13 expected savings (1,344,210 kWh).

In PY13, there was a significant increase in expected energy savings from the HESK pull kits and the LTN push kits. The HESK pull kits accounted for 286,627 kWh of savings (or 1.7% of total PY13 expected savings) while the LTN push kits accounted for 15,183,571 kWh of savings (or 87.8% of total PY13 expected savings).

For comparison, in PY13 a total of 38.5% of ex ante gross energy savings for HPwES were from the and HESK pull kits (5.2%) and the LTN pull kits (33.3%). Year-over-year, savings attributed to HESK decreased, and although there was a significant drop in HESK savings, a large portion of expected savings was shifted over to the LTN Kits. Going forward, the contribution to savings from residential lighting will likely decrease as the impacts of EISA are further enforced.

4.2.2 TIMING OF PROJECTS

The figure below shows *ex ante* energy savings (kWh) for HPwES by end use, by month. There was a large increase in number of lighting project completions during the months of March through May, possibly in an effort to complete as many projects as possible before the EISA policy enforcement date of July 1st, 2023.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water	9,585	92,913	37,258	6,524	7,885	8,768	1,777	1,355	899	6,059	1,600	2,032
Lighting	29,273	105,729	5,292,858	5,013,146	5,015,809	38,948	16,595	13,839	10,705	25,856	7,470	10,550
HVAC	85,185	107,594	75,952	50,318	68,421	18,163	41,928	51,200	56,641	133,658	97,604	63,784
Envelope	23,850	29,388	13,869	35,884	34,750	27,873	81,244	21,158	22,186	31,545	63,554	53,749
Appliances	15,677	16,388	33,809	15,879	22,849	19,366	18,852	23,156	16,600	38,012	17,829	17,517

FIGURE 4-2 *EX ANTE* SAVINGS BY END USE BY MONTH

4.2.3 TRADE ALLIES

There are 12 trade allies in the HPwES program, one of which is the TPI, Franklin Energy (Franklin). Franklin is the sole installer of direct install measures and performs all assessments; the trade allies install air infiltration, attic insulation, and duct sealing. Franklin projects represent 41% of *ex ante* gross energy savings (kWh) and 53% of incentives paid.

The table below shows the distribution of savings across all trade allies and Franklin.

TABLE 4-5 HPWES TRADE ALLY ACTIVITY

Trade Ally	*Ex Ante* Gross Energy Savings (kWh)	% of kWh Savings
Franklin	876,789	41%
TA 2	560,292	26%
TA 3	287,862	14%
TA 4	145,935	7%

TA 5	82,959	4%
TA 6	67,755	3%
TA 7	22,246	1%
TA 8	22,095	1%
TA 9	18,926	< 1%
TA 10	16,954	< 1%
TA 11	14,023	< 1%
TA 12	3,460	< 1%

4.2.4 GOAL ACHIEVEMENT

Total verified savings and percentage of goals for the HPwES are summarized in the tables below.

TABLE 4-6 PY13 HPWES PROGRAM VERIFIED SAVINGS

Ex Post Gross Energy Savings (kWh) Goal	% to kWh Goal	*Ex Post* Gross Savings (kW) Target	% to kW Target
16,461,506	101%	NA	NA

4.3 EM&V Methodology

The HPwES program has received comprehensive impact and process evaluations in PY13. The evaluations performed site visits, trade ally interviews, and participant surveys which provided NTG and in-service rate estimates, feedback on program satisfaction and strategic recommendations for program improvement, and information on how trade ally experience program participation.

Verified savings were calculated using methods and inputs in the NO TRM V6.1 and incorporated results from literature reviews, participant surveys, property manager interviews and site visits to determine appropriate adjustment factors, such as in-service rates (ISR) for each measure.

4.3.1 SITE VISITS

The Evaluators performed twenty-six (26) site visits on projects in the program. The table below outlines the measures encountered and verified through the site visits.

TABLE 4-7 SITE VISIT SUMMARY

Measure	PY13 Participant Count	Found in PY13 Site Visit
Advanced Power Strip (Tier 2)	844	12
Air Infiltration	257	17
Attic Insulation	18	2
Duct Sealing	368	14
Faucet Aerator	106	1

LED Lamp	6,343	232
Low-Flow Showerhead	81	1
Smart Thermostat	137	2
Water Heater Pipe Insulation	53	0

Measure-specific findings of note are outlined in the bullets below:

- Air Infiltration: during the site visits conducted in PY13, the Evaluators' field staff conducted blower door testing in 17 homes to validate post-retrofit home leakage estimates indicated in program tracking data. The resulting average post-retrofit leakage estimate was calculated as 71.7% of expected leakage reductions. That is, of 17 homes the Evaluators found that the air infiltration $CFM50_{post}$ results were 28.3% lower than those reported in tracking data. The Evaluators opted to supplement the air infiltration site visit finding with literature review results, as well as blending the findings with ISRs from the NO TRM 6.1.
- Duct Sealing: during the site visits conducted in PY13, the Evaluators' field staff conducted duct system pressurization testing in 14 homes to validate post-retrofit duct leakage estimates indicated in program tracking data. The resulting average post-retrofit leakage estimate was calculated as 84.0% of expected leakage reductions. That is, of 14 homes the Evaluators found that duct sealing $CFM25_{post}$ results were 16.0% higher than those reported in tracking data. The Evaluators opted to supplement the air infiltration site visit finding with literature review results, as well as blending the findings with ISRs from the NO TRM 6.1.

Additional measure-specific impacts were derived from the PY13 participant survey, which is described further in Section 4.4.3.5 below. There were surveys for both kit and non-kit offerings.

ISR results are presented in the table below. Air infiltration, attic insulation, and duct sealing gross impacts were derived solely from site visit findings. The remaining are from the participant survey. All results are also benchmarked against similar programs in the region to ensure they are within industry standards.

The largest barrier to scaling site visits was effective participant contact information.

4.3.2 DEEMED SAVINGS CALCULATIONS

4.3.2.1 Air Infiltration

Methods for deemed savings for air infiltration reduction came from the NO TRM V6.1, Section 1.4.7. Deemed savings multipliers were developed through EnergyGauge, a simulation software program. Multiple equipment configurations were simulated in developing savings values denominated in deemed savings per CFM50 of air leakage rate reduction. Table 4-8 summarizes the deemed savings values for New Orleans.

TABLE 4-8 DEEMED SAVINGS VALUES FOR AIR INFILTRATION REDUCTION

Equipment Type	kWh/CFM Savings	kW/CFM Savings
Electric AC with Gas Heat	0.4108	0.000331
Elec. Resistance w/ AC	1.0180	0.000332
Heat Pump	0.7210	0.000332

For example, consider a residence with electric AC and gas heat located. If the residence had a leakage rate of 7,200 CFM50 before air infiltration reduction and a leakage rate of 3,500 CFM50 after, then the residence would have an annual savings of:

$$Air\ Infiltration\ Savings = 0.4108 \frac{kWh\ Savings}{CFM_{50}} \times \left(7{,}200\ CFM_{50\ pre} - 3{,}500\ CFM_{50\ post}\right)$$

$$Air\ Infiltration\ Savings = 1{,}519.96\ kWh$$

4.3.2.2 Duct Sealing

Duct sealing savings were calculated using the following savings algorithms from the NO TRM V6.1, Section 1.3.8.

Energy (kWh) savings:

$$kWh_{savings\ (Cooling)} = \frac{(DL_{pre} - DL_{post}) \times EFLH_C \times (h_{out}\rho_{out} - h_{in}\rho_{in}) \times 60}{1{,}000 \times SEER}$$

$$kWh_{savings\ (Heating)} = \frac{\left(DL_{pre} - DL_{post}\right)/((CAP/12{,}000) \times 400) \times EFLH_h \times CAP \times TRFheat}{\eta\text{Heat} / 3{,}412}$$

Where:

DL_{pre} = Pre-improvement duct leakage at 25 Pa (ft3/min)
DL_{post} = Post-improvement duct leakage at 25 Pa (ft3/min)
ΔDSE = Assumed improvement in distribution system efficiency = 5% = 0.05
$EFLH_C$ = Equivalent Full Load Hours - cooling (1,637)
h_{out} = Outdoor design specific enthalpy (Btu/lb)
h_{in} = Indoor design specific enthalpy (Btu/lb.)
ρ_{out} = Density of outdoor air at 95°F = 0.0740 (lb/ft3)[5]
ρ_{in} = Density of conditioned air at 75°F = 0.0756 (lb./ft3)
$EFLH_H$ = Equivalent Full Load Hours - heating (600)
$12{,}000$ = Btu/ton conversion factor
$TRFheat$ = Thermal Regain Factor for heating = 1.0 Unconditioned; 0.4 Semi-conditioned space
ηHeat = Efficiency in COP of Heating equipment = Actual. If unavailable, use 1.0.
$3{,}412$ = Conversion of BTU/kWh.

Demand (kW) Reductions:

[5] ASHRAE Fundamentals 2009, Chapter 1: Psychometrics, Equation 11, Equation 41, Table 2.

$$kW_{reductions} = \frac{kWh_{savings\ (Cooling)}}{EFLH_C} \times CF$$

$kWh_{savings\ (Cooling)}$ = Calculated kWh savings for cooling

$EFLH_C$ = Equivalent Full Load Hours - cooling (1,637)

CF = Coincidence factor = 0.77

TABLE 4-9 DEEMED INPUT VALUES FOR DUCT SEALING CALCULATIONS

Parameter Input	Value
$EFLH_C$	1,637
$EFLH_H$	600
h_{out}	40
h_{in}	30
ρ_{in}	0.076
ρ_{out}	0.074
SEER	11.5
HSPF	7.30

4.3.2.3 LED Lamp

Methods for calculating deemed savings came from NO TRM V6.1. The methodology for ENERGY STAR directional, decorative, and omni-directional LED lamp is found in Sections 1.5.

$$kWh_{savings} = \left((W_{base} - W_{post})/1000\right) \times Hours \times ISR \times IEF_E$$

$$kW_{savings} = \left((W_{base} - W_{post})/1000\right) \times CF \times ISR \times IEF_D$$

Where:

W_{base} = Based on wattage equivalent of the lumen output of the installed

W_{post} = Actual wattage of LED lamp installed

$Hours$ = Average hours of use per year: 880.5 hours for indoor LED lamps, 4,319 hours for outdoor

IEF_E = Interactive Effects Factor to account for cooling energy savings and heating energy penalties

IEF_D = Interactive Effects Factor to account for cooling demand reductions and heating energy penalties

CF = Coincidence Factor, (11.12%)

ISR = In-Service Rate

TABLE 4-10 LED ENERGY AND DEMAND INTERACTIVE FACTORS

Parameter Input	IEF_E	IEF_D
Gas Heat with AC	1.10	1.29
Electric Resistance Heat with AC	0.83	1.29
Heat Pump	0.96	1.29
Heating/Cooling Unknown[6]	0.91	1.21

The implementer, in accordance with the NO TRM V6.1, had trade allies collect the baseline bulb for each LED lamp direct installed in the program. The Evaluators counted those LED lamps and compared them to program counts.

4.3.2.4 Other Measures

For remaining measures, the Evaluators used the following NO TRM V6.1 sections and tables to verify savings.

TABLE 4-11 NO TRM V6.1 SECTIONS FOR OTHER MEASURES - HPWES

Measure	TRM Section	Calculated / Deemed	TRM Table(s)	Table Page(s)
Faucet Aerator	1.2.4	Deemed	Table 1-51	78
Attic Insulation	1.4.2	Deemed	Table 1-107, 1-108	136
Pipe Wrap	1.2.3	Calculated	N/A	255
Advanced Power Strip	1.1.7	Deemed	Table 1-17	37
Showerhead	1.2.5	Deemed	Table 1-59	86
Smart Thermostat	1.3.9	Deemed	Table 1-100	132

4.4 Evaluation Findings

Evaluation findings, by measure, can be reviewed in Section 4.1.

4.4.1 GROSS IMPACT FINDINGS

4.4.1.1 Advanced Power Strip (Tier 2)

Expected and verified savings for Tier 2 advanced power strips are summarized below. There were 844 units installed at 693 homes.

TABLE 4-12 PY13 HPWES EXPECTED AND VERIFIED ADVANCED POWER STRIP SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
255,935	220,590	86.2%	26.43	22.78	86.2%

[6] Unknown factors are based on EnergyStar interactive effects, weighted by primary data collected on New Orleans typical HVAC arrangements.

4.4.1.2 Aerator (Bathroom & Kitchen)

Expected and verified savings for aerators are summarized below. There were 57 bathroom aerators installed in 35 homes, while there were 49 kitchen aerators installed in 49 homes.

TABLE 4-13 PY13 HPWES EXPECTED AND VERIFIED AERATORS SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
3,788	3,371	89.0%	0.39	0.35	89.4%

4.4.1.3 Air Infiltration

The savings resulting from using NO TRM V6.1 algorithms and deemed savings parameters, plus the application of the measure ISR are summarized in Table 4-14. There were 257 installations.

TABLE 4-14 PY13 HPWES EXPECTED AND VERIFIED AIR INFILTRATION SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
397,559	349,107	87.8%	166.07	146.12	88.0%

4.4.1.4 Attic Insulation

Expected and verified savings for the attic insulation projects are summarized below. There were 18 installations of this measure.

TABLE 4-15 PY13 HPWES EXPECTED AND VERIFIED ATTIC INSULATION SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
41,490	41,427	99.8%	67.33	67.23	99.8%

4.4.1.5 Duct Sealing

The savings resulting from using NO TRM V6.1 algorithms and deemed savings parameters, plus the application of the measure ISR are summarized in Table 4-16. There were 368 installations of duct sealing.

TABLE 4-16 PY13 HPWES EXPECTED AND VERIFIED DUCT SEALING SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
803,458	872,593	108.6%	298.66	322.49	108.0%

4.4.1.6 HESK (Kit)

The savings resulting from using NO TRM V6.1 algorithms and deemed savings parameters, application of the measure-level ISR, as well as the application of the recipient survey results are summarized in Table 4-17. There were 1,562 kits. Lower realization rates are due to the measure-level ISRs that were applied.

TABLE 4-17 PY13 HPWES EXPECTED AND VERIFIED HESK SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
286,627	255,990	89.3%	23.27	35.57	152.8%

4.4.1.7 LED Lamp (Direct Install)

Expected and verified savings LED lamps are summarized below. There were 3,494 specialty and 2,849 standard LED lamps; installed in both indoor and outdoor applications.

TABLE 4-18 PY13 HPWES EXPECTED AND VERIFIED LED SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
260,687	267,192	102.5%	30.45	32.24	105.9%

4.4.1.8 LTN Kit

The savings resulting from using NO TRM V6.1 algorithms and deemed savings parameters are summarized in Table 4-19. The slightly lower realization rates may be attributed to the measure ISR applied in PY13. There were 24,737 kits distributed.

TABLE 4-19 PY13 HPWES EXPECTED AND VERIFIED LTN KIT SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
15,183,571	14,564,581	95.9%	400.74	385.33	96.2%

4.4.1.9 Water Heater Pipe Wrap

Expected and verified savings for the pipe wrap projects are summarized below. Pipe wrap was installed at 53 residences.

TABLE 4-20 PY13 HPWES EXPECTED AND VERIFIED PIPE WRAP SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
5,433	5,015	92.3%	0.62	0.57	92.3%

4.4.1.10 Low-Flow Showerhead

Expected and verified savings for showerheads are summarized below. There were 81 low-flow showerheads installed at 54 residences.

TABLE 4-21 PY13 HPWES EXPECTED AND VERIFIED SHOWERHEADS SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
17,328	17,270	99.7%	1.80	1.80	99.7%

4.4.1.11 Smart Thermostat

Expected and verified savings for smart thermostats are summarized below. There were 137 smart thermostats installed at 117 residences.

TABLE 4-22 PY13 HPWES EXPECTED AND VERIFIED SMART THERMOSTAT SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
46,991	46,774	99.5%	0.00	0.00	N/A

4.4.1.12 Avoided Replacement Cost

The Evaluators have added the benefits of avoided replacement costs (ARC). The table below summarize the ARC by measure in HPwES.

Information on methodology can be found in Section 3.4.1.3 Avoided Replacement Costs.

TABLE 4-23 SUMMARY OF ARC FOR HPWES

LED Lamp Type	*Ex Post* Gross ARCs ($)	*Ex Post* Net ARCs ($)	NPV ARCs ($)
LED Lamp 11W (A Type)	$78	$48	$48
LED Lamp 11W (Flood)	$296	$181	$181
LED Lamp 15W (Outdoor/A Type)	$11	$6	$6
LED Lamp 15W (Outdoor/PAR38)	$87	$53	$53
LED Lamp 5W (Candelabra)	$514	$315	$315
LED Lamp 6W (Globe)	$77	$47	$47
LED Lamp 8W (Flood)	$27	$16	$16
LED Lamp 9W (A Type)	$728	$445	$445
Pull Kit - LED Lamp 15W (A Type)	$317	$244	$244
Pull Kit - LED Lamp 9W (A Type)	$952	$731	$731
Push Kit - LED Lamp 13W (A Type)	$4,958	$2,805	$2,805
Push Kit - LED Lamp Kit 15W (PAR38)	$9,916	$5,609	$5,609
Push Kit - LED Lamp Kit 9W (A Type)	$24,789	$14,023	$14,023
Total	**$42,749**	**$24,522**	**$24,522**

Sums may differ due to rounding.

4.4.2 NET IMPACT FINDINGS

The Evaluators conducted surveys and applied net-to-gross ratios based on their results. PY13 results were used in the absence of sufficient responses.

- Participant survey responses were used to estimate the net energy impacts of the program. The program net savings are equal to gross savings, less savings associated with free-ridership, plus participant spillover savings.
- To estimate program-level free-ridership, the Evaluator calculated free-ridership scores for major and direct install measures, weighted by the participants' gross energy savings. The major and direct install measure free-ridership ratios were used to factor the program verified gross savings for the two measure types to estimate free-ridership.
- Insufficient survey responses were collected for direct install water saving measures; ADM applied the net-to-gross ratios found for kit water saving measures to the direct install water saving measures.
- A spillover ratio was developed by dividing the total energy savings resulting from spillover measures by the total gross energy savings for the sample of survey respondents. The methodology is cited in Section 3.3.2.4.6. We did not find attributable spillover for kits; we found a spillover ratio of 0.1% for major measures.

The tables below summarize the net impacts for the HPwES program.

TABLE 4-24 PY13 HPWES PROGRAM NET SAVINGS

Ex Post Gross Energy Savings (kWh)	*Ex Post* Net Energy Savings (kWh)	NTG kWh	*Ex Post* Gross Demand Reductions (kW)	*Ex Post* Net Demand Reductions (kW)	NTG kW
17,302,866	10,106,743	60.7%	1,014.48	809.52	60.7%

4.4.3 PROCESS FINDINGS

The Evaluators conducted a process evaluation in PY13 of the HPwES. Process activities included a database review, participant survey, and staff and implementer interviews.

The HPwES program aligns with the Department of Energy (DOE) requirements and uses a whole-house approach. This program may or may not include customer co-pay, dependent on the trade ally costs and if they exceed the incentive; all residential customers who live in a single-family home are eligible. The activities used to support this evaluation are summarized in Table 4-25.

TABLE 4-25 HPWES DATA COLLECTION ACTIVITIES

Evaluation Activity	Sample Size	Impact	Process
Staff & TPI Interviews	4		X
Database Reviews	Census	X	X
Participant Surveys	100	X	X
Desk Reviews	Census	X	
Site Visits	68	X	X

4.4.3.1 Staff and Implementer Interviews

The following section summarizes the key findings from in-depth interviews with two ENO program staff, one APTIM staff, and one Franklin staff; ENO staff participated in one interview and APTIM and Franklin staff participated in a second interview. These in-depth interviews aimed to learn more about HPwES program design and operations, and the successes and challenges experienced during PY13. Interviews lasted approximately 60

minutes and were conducted using the Microsoft Teams platform. The evaluators recorded all interviews with participant permission. The following narrative summarizes these interviews.

4.4.3.1.1 *Program Description*

HPwES is designed to achieve long-term, significant cost-effective electric savings through the use of local auditors and trade allies who will help residential customers analyze their energy use and identify opportunities to improve efficiency, install low-cost energy-saving measures, and identify and implement more comprehensive home efficiency projects.

HPwES offers three levels of home energy audits. The Level I Assessment will include a "walk-through" inspection and direct installation of low-cost measures, such as LED lamps and water conservation measures. To generate additional savings at the time of the audit, demand response-enabled smart thermostats were added as a direct install measure. The Level II and III Assessments are comprehensive home inspections with diagnostic testing, performed by a qualified trade ally, targeted to achieve deeper savings within the home.

To meet the needs of New Orleans' unique housing stock of double shot-gun homes and smaller multifamily configurations, the offering now includes all buildings with four or fewer units in the HPwES offering. Structures of this size and construction type often behave and function more like single-family homes, with owners often occupying one of the units, thus minimizing the split-incentive barrier.

4.4.3.1.2 *Program Implementation*

Staff explained that the program stayed relatively the same between PY12 and PY13. Franklin's team conducts an assessment and installs direct install measures during one appointment and then uses assessment report to determine what other measure upgrades the home requires. Once necessary upgrades are identified, the home is assigned to a trade ally who schedules an appointment with the customer, completes the installation, and submits the rebate application.

In PY13, the program had approximately 14 active trade allies engaged with the program. Degrees of participation among the trade allies varies, and program staff try assign project leads based on capacity and performance.

The program did not experience any major measure changes in PY13. Due to EISA regulations LED lamp savings are being reduced over the next two years, however assessors and trade allies can continue to replace incandescent bulbs with LED lamps until 2025. Moving forward, ENO will not offer lighting kits; staff are still deciding whether or not non-lighting measures, such as faucet aerators and showerheads, will be offered in a kit. In the past, lighting kits were used as a lead generating source for other programs, with 10% of kit recipients converting into HPwES or Income Qualified program participants.

Staff noted that savings per home have increased substantially in PY13, as trade allies have done a better job connecting customers to other resources and improvements. Overall, more savings are coming from trade ally installed measures than direct install measures, which staff celebrate.

4.4.3.1.3 *Marketing*

Energy Smart program employs a variety of marketing strategies to increase interest and engagement in the HPwES program. Marketing strategies include outreach by Energy Wise and trade ally partners, one pagers, bill

inserts, and website banners. Staff have also focused on engaging community groups to help promote the program and encourage residents to participate.

4.4.3.2 Participant Survey Results

Evaluators conducted a survey to better understand the customer experience with the HPwES program. 1,764 customers of Entergy New Orleans who participated in the Home Performance with Energy Start (HPwES) program were invited to complete a survey. 100 participants completed the survey. Program respondents received different services depending on qualifications and preferences. Table 4-26 shows the number of respondents who received each service.

TABLE 4-26 PROGRAM PARTICIPATION (N=100)

RESPONDENTS	Count
Total Completed Surveys	100
Received Major Measure Improvements	12
Received Direct Installment Measure Improvements	12
Received an Energy Saving Kit	75
Received LED bulbs in Energy Saving Kit (73) or through Direct Installment (11)	84

4.4.3.2.1 *Awareness and Motivations*

Nearly two-thirds of respondents heard about the HPwES program from an email they received from Entergy (65.0%, n=65) (Table 4-27). Most were motivated to join the program to save money on utility bills (79.0%, n=79). The next most frequent motivations were to conserve energy (64.0%, n=64) and get free equipment, discounts, and rebates (56.0%, n=56).

TABLE 4-27 PROGRAM AWARENESS AND INFLUENCE (N=100)

Source	%
Email from Entergy	65.0%
Friend, family member, or colleague	15.0%
Bill insert or utility mailer	11.0%
Program website	7.0%
Contractor	4.0%
Social media post (e.g., Facebook, Twitter)	4.0%
Through an internet search or advertisement	4.0%
Home energy consultant	2.0%
Program representative	2.0%
A radio or television advertisement	2.0%
A print advertisement	1.0%
Other	1.0%

TABLE 4-28 MOTIVATIONS FOR PARTICIPATING (N=100)

Reason	%
Save money on energy bills	79.0%
Conserve energy/Protect the environment	64.0%
Get the free equipment/discount/rebate	56.0%
Improve the comfort of your home	33.0%
Become as energy efficient as my friends or neighbors	21.0%
Improve the value of the residence	19.0%
Find out if there were any structural problems	2.0%

4.4.3.2.2 *Major Measure Improvements*

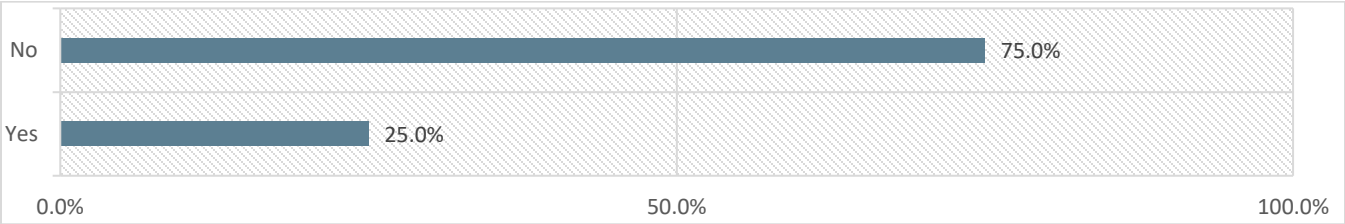
Of the 100 respondents who participated in the program, 12 received at least one of the major measure improvements. A total of 17 major measure improvements were completed (Table 4-29).

TABLE 4-29 NUMBER OF RESPONDENTS WHO RECEIVED MAJOR MEASURE IMPROVEMENTS (N=17)

Major Measure Improvements	# of Improvements completed	% of respondents who received improvements
Air infiltration	6	6.0%
Duct sealing	8	8.0%
Smart thermostat	2	2.0%
Attic and ceiling insulation	1	1.0%
Total	**17**	**12.0%**

Of the 12 respondents who received a major measure improvement, three were already planning to make the improvement and only one had the budget to complete the whole project. The majority of respondents who received a major measure improvement would not have completed the project were it not for the HPwES program (75.0%, n=9) (Figure 4-3).

FIGURE 4-3 WOULD RESPONDENTS COMPLETE THE SAME PROJECT (N=12)



4.4.3.2.3 *Direct Installation Measure Improvements*

The most common direct installation measures completed were LED lightbulbs. None of the DI measures had been removed. The one respondent with the APS uses it for the television (Table 4-30).

TABLE 4-30 RESPONDENTS WHO RECEIVED DIRECT INSTALLATION MEASURE IMPROVEMENTS (N=12)

Direct Installation Measure Improvement Types	Count
LED Lamp	11
Advanced Power Strip	1
Bathroom Aerator	1
Kitchen Aerator	1
Water Heater Pipe Wrap	1

4.4.3.2.4 *Home Energy Saving Kit*

Seventy-five respondents received an energy saving kit, 54 of which were ordered via the online marketplace (OLM). Almost all kits included LED lamps (97.0%, n=73). Most respondents installed at least 2 of the 4 LED lamps they received through the program (86.3%, n=63). The majority of those who have not installed all of the LED lamps say they are waiting for the old ones to burn out (83.7%, n=31) (Table 4-31).

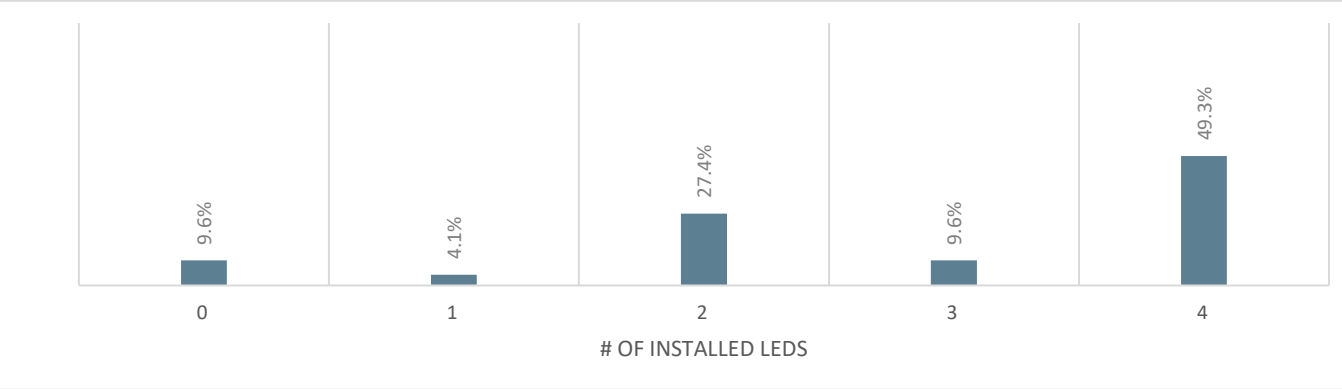


FIGURE 4-4 LED INSTALLATIONS (N=75)

TABLE 4-31 REASONS FOR NON-INSTALLATIONS (N=37)

	%
Waiting for old bulbs to burn out	83.7%
Have not had time to install it	10.8%
Gave it to someone else	5.4%
Do not like the light or appearance of the bulbs	2.7%
The provided bulbs do not fit in any of my fixtures or lamps	2.7%
I misplaced the kit	2.7%
Other	2.7%

A total of 84 respondents either received LED lamps in the energy saving kit (n=73) or received LED lamps as a DI measure (n=11). Most planned on purchasing LED lamps before receiving them from the program (69.0%, n=58).

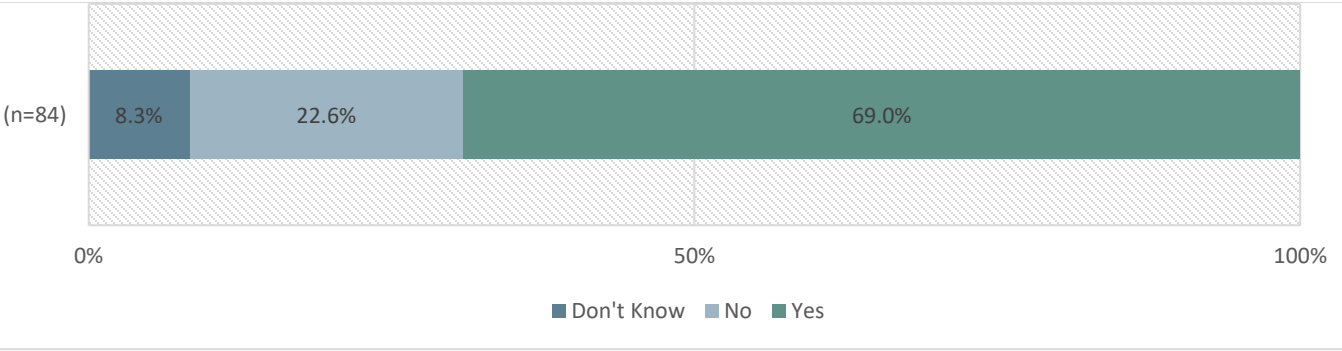


FIGURE 4-5 PLANNED TO PURCHASE LED LAMPS (N=84)

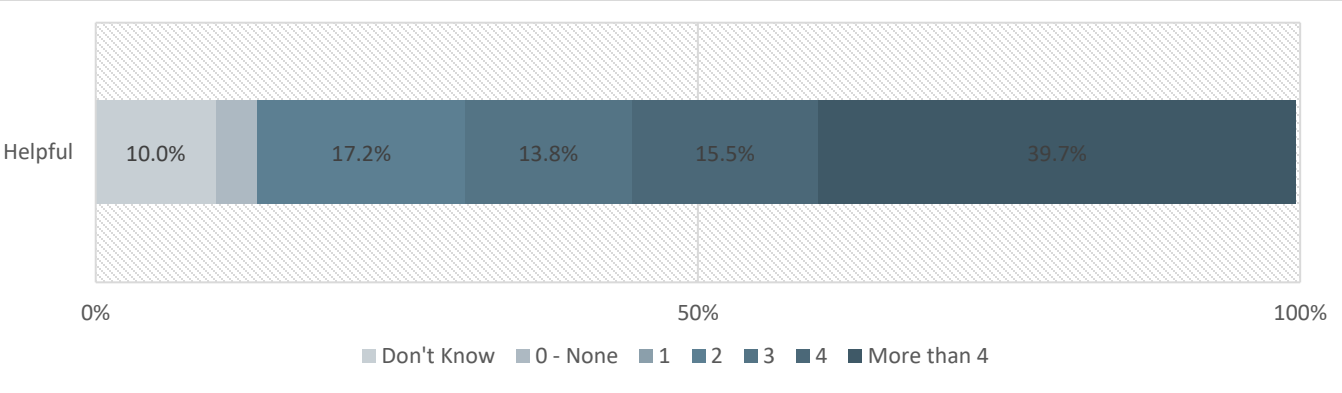


FIGURE 4-6 QUANTITY THEY PLANNED TO PURCHASE (N=84)

Over half of respondents had installed at least some LED lamps in their homes before the program (53.6%, n=45). The Energy Saving Kit included bathroom aerators, kitchen aerators and showerheads. Over half of respondents reported having installed all three measures. About a third of respondents reported having received them but not having installed them at the time of the survey.

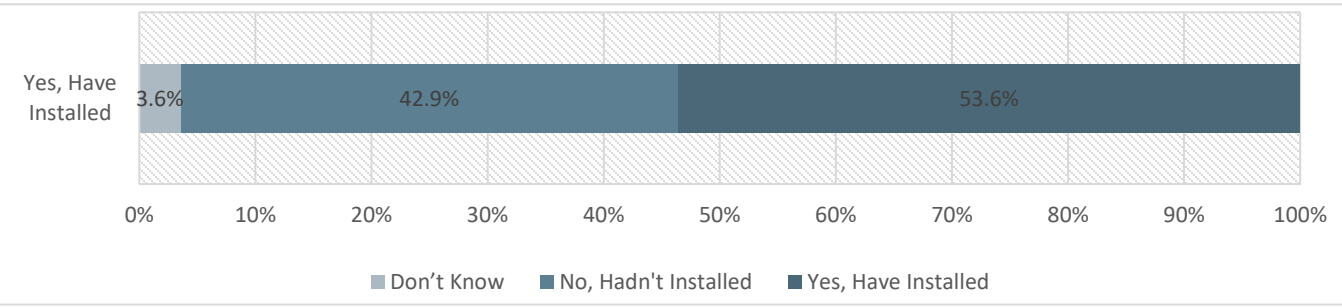


FIGURE 4-7 INSTALLED LED LAMPS PRIOR TO PARTICIPATING (N=84)

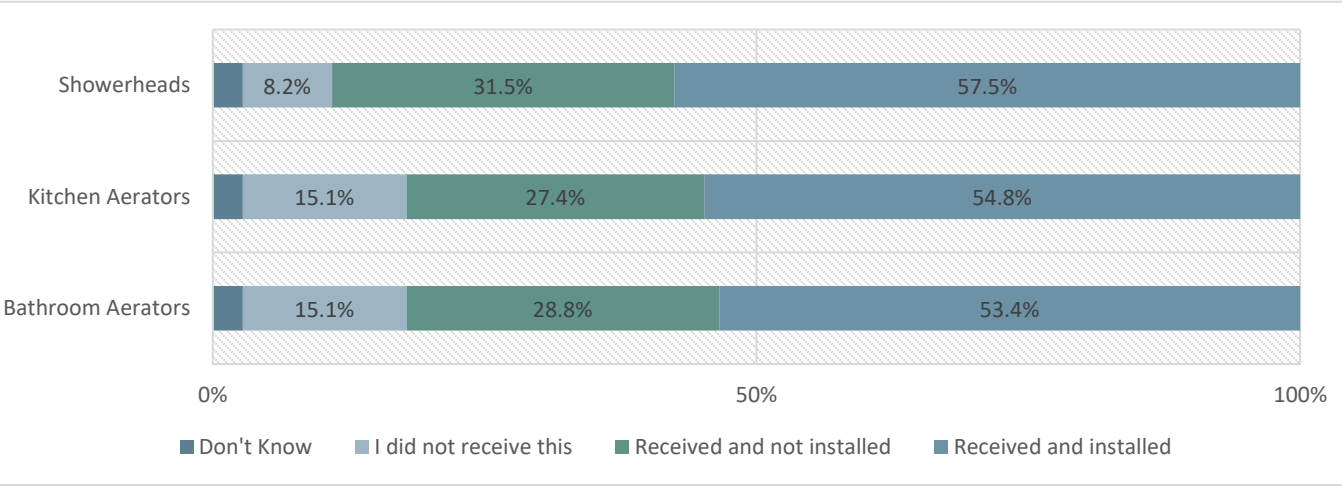


FIGURE 4-8 OTHER MEASURES

Among those who have not installed measures, the main reasons were lack of time and a problem with the fit for their faucets. There were also a number of respondents who needed help with the installation, particularly with showerheads and bathroom aerators.

TABLE 4-32 : REASONS FOR NOT INSTALLING ALL ADDITIONAL MEASURES

Reasons for Not Installing	Bathroom Aerators (n=21)	Kitchen Aerators (n=20)	Showerheads (n=23)
Have not had time to install it	33%	25%	17%
Doesn't fit on your faucet	29%	35%	17%
Need help / don't know how to install it	24%	15%	30%
Do not like low-flow devices	19%	25%	26%
Gave it to someone else	5%	0%	4%
I misplaced the kit	5%	5%	4%
Other	5%	15%	13%

4.4.3.2.5 *Satisfaction*

While respondents are at least somewhat satisfied with most aspects of the HPwES program, about 2 in 5 are somewhat satisfied with the savings on their monthly utility bills. Additionally, only half are satisfied with the quality of the installation performed by the contractor.

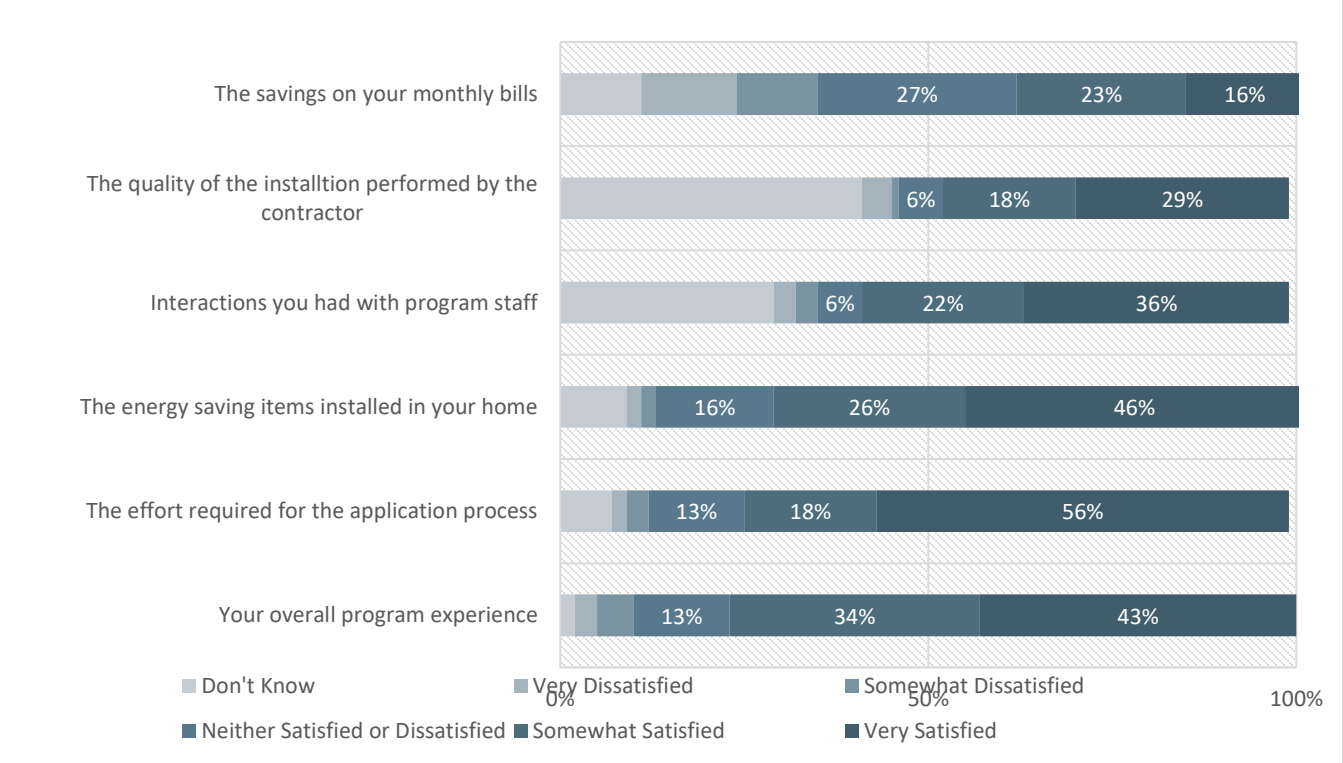


FIGURE 4-9: PROGRAM SATISFACTION (N=100)

4.5 Data Tracking Review

The Evaluators reviewed the implementer-provided tracking data and noted that the fields that were missing in PY13 data were generally present in PY13.

The following bullets outline notes from reviewing the HPwES data:

- Installation dates: the Evaluators noted that installation dates were added in for PY13
- Trade ally information: In general, Trade Ally primary contact names, company names, contact phone numbers, and email addresses were provided in PY13 data, however, there were a handful of projects that were missing these fields - this review excludes the tracking data that only provided the LTN push kit projects:
    - Trade ally primary contact name: 20 projects in 11 distinct homes (11 out of 2,521 homes)
    - Trade ally main phone number: 53 projects (30 distinct homes out of 2,521)
    - Trade ally email address: 53 projects (30 distinct homes out of 2,521)
- Participant information: In general, participant contact names, contact phone numbers, and email addresses were provided in PY13 data, however, there were many projects that were missing these fields:
    - Participant primary contact name: all projects had contact names
        - Emails were included in contact names: 5,628 projects (1,379 out of 2,521)
    - Participant main phone number: 58 projects (13 out of 2,521)
    - Participant email address (blank or invalid): 1,812 projects (388 out of 2,521)

In PY13, the Evaluators noted that the data for LTN push kits were provided as a separate file. This made distinguishing all LED lamps a little more straightforward.

To further improve on tracking data categorization, the Evaluators recommend a measure naming convention that aligns with the most current NO TRM (in this case NO TRM V6.1). This may simplify efforts in assuring that all parties involved in implementation and evaluation have the correct expected energy (kWh), expected demand reductions (kW), and incentive totals for all measures offered in a program year.

4.6 Findings and Recommendations

Findings and Conclusions:

- Effective Communication Channels: The evaluation found that email communication from the program was the most effective means of informing customers about the program. This underscores the importance of targeted email campaigns in reaching and engaging potential participants.
- Motivation for Participation: The primary motivation for customers to participate in the program was the potential to save money on their energy bills. This highlights the significance of cost savings as a key driver for customer engagement in energy efficiency programs.
- Impact of Major Measure Improvements: Major measure improvements, such as air and duct sealing, were identified as having a significant impact. Customers who received these improvements stated that they would not have undertaken them without the incentives and assistance provided by the program.

Recommendations:

- Email Communication: Given the effectiveness of email communication, it is recommended to continue prioritizing this channel to attract customers to the program. Consistent and targeted email campaigns can maximize program visibility and participation.
- Comprehensive Program Details: Providing accurate and comprehensive program details to customers is essential. This includes actionable steps to realize energy bill savings and tips and assistance related to achieving these savings. Clear and detailed information will enhance customer understanding and engagement with the program.

5 INCOME QUALIFIED WEATHERIZATION

5.1 Summary

The tables below report *ex ante* gross, *ex post* gross, *ex post* net energy savings (kWh) (both annual and lifetime), demand reductions (kW), participation, and incentive spend, by measure, where applicable.

TABLE 5-1 PY13 IQW ENERGY SAVINGS (KWH)

Measure	Ex Ante Gross Savings (kWh)	Realization Rate (kWh)	Ex Post Gross Savings (kWh)	NTG	Ex Post Net Savings (kWh)
Advanced Power Strip (Tier 2)	254,508	92.4%	235,268	100.0%	235,268
Air Infiltration	1,043,478	89.7%	936,179	100.0%	936,179
Assessment	0	100.0%	0	100.0%	0
Attic Insulation	375,149	93.8%	352,075	100.0%	352,075
Bathroom Aerator	37,869	98.4%	37,266	100.0%	37,266
Duct Sealing	2,055,837	109.7%	2,255,204	100.0%	2,255,204
Kitchen Aerator	12,891	98.4%	12,683	100.0%	12,683
LED Lamp 11W (A Type)	10,329	102.4%	10,577	100.0%	10,577
LED Lamp 11W (Flood)	26,536	98.2%	26,068	100.0%	26,068
LED Lamp 15W (Outdoor/A Type)	801	97.1%	778	100.0%	778
LED Lamp 15W (Outdoor/PAR38)	92,247	81.8%	75,456	100.0%	75,456
LED Lamp 5W (Candelabra)	71,717	90.2%	64,667	100.0%	64,667
LED Lamp 6W (Globe)	7,929	91.0%	7,215	100.0%	7,215
LED Lamp 8W (Flood)	3,706	101.1%	3,747	100.0%	3,747
LED Lamp 9W (A Type)	136,567	89.6%	122,414	100.0%	122,414
Low-Flow Showerhead	124,716	88.8%	110,713	100.0%	110,713
Pipe Wrap	46,763	93.2%	43,604	100.0%	43,604
Smart Thermostat	62,083	99.5%	61,796	100.0%	61,796
Total	**4,363,127**	**99.8%**	**4,355,709**	**100.0%**	**4,355,709**

Sums may differ due to rounding.

TABLE 5-2 PY13 IQW DEMAND REDUCTIONS (KW)

Measure	Ex Ante Gross Reductions (kW)	Realization Rate (kW)	Ex Post Gross Reductions (kW)	NTG	Ex Post Net Reductions (kW)
Advanced Power Strip (Tier 2)	26.24	92.4%	24.26	100.0%	24.26
Air Infiltration	469.02	89.7%	420.79	100.0%	420.79
Assessment	0.00	100.0%	0.00	N/A	0.00
Attic Insulation	768.28	93.6%	719.09	100.0%	719.09
Bathroom Aerator	3.90	99.4%	3.88	100.0%	3.88
Duct Sealing	687.91	110.4%	759.27	100.0%	759.27
Kitchen Aerator	1.35	97.9%	1.32	100.0%	1.32
LED Lamp 11W (A Type)	1.76	96.1%	1.69	100.0%	1.69
LED Lamp 11W (Flood)	4.47	98.2%	4.39	100.0%	4.39
LED Lamp 15W (Outdoor/A Type)	0.00	N/A	0.00	100.0%	0.00
LED Lamp 15W (Outdoor/PAR38)	0.00	N/A	0.00	100.0%	0.00
LED Lamp 5W (Candelabra)	12.38	92.6%	11.46	100.0%	11.46
LED Lamp 6W (Globe)	1.35	92.5%	1.25	100.0%	1.25
LED Lamp 8W (Flood)	0.61	96.1%	0.58	100.0%	0.58
LED Lamp 9W (A Type)	23.53	93.5%	21.99	100.0%	21.99
Low-Flow Showerhead	12.96	88.8%	11.51	100.0%	11.51
Pipe Wrap	5.30	93.3%	4.94	100.0%	4.94
Smart Thermostat	0.00	N/A	0.00	100.0%	0.00
Total	**2,019.07**	**98.4%**	**1,986.43**	**100.0%**	**1,986.43**

Sums may differ due to rounding.

TABLE 5-3 PY13 IQW LIFETIME SAVINGS SUMMARY

Measure	EUL	Ex Post Gross Lifetime Energy Savings (kWh)	Ex Post Net Lifetime Energy Savings (kWh)
Advanced Power Strip (Tier 2)	10	2,352,676	2,352,676
Air Infiltration	11	10,297,970	10,297,970
Assessment	1	0	0
Attic Insulation	20	7,041,504	7,041,504
Bathroom Aerator	10	372,662	372,662
Duct Sealing	18	40,593,679	40,593,679
Kitchen Aerator	10	126,828	126,828
LED Lamp 11W (A Type)	3	26,442	26,442
LED Lamp 11W (Flood)	3	65,170	65,170
LED Lamp 15W (Outdoor/A Type)	3	1,945	1,945
LED Lamp 15W (Outdoor/PAR38)	3	188,640	188,640
LED Lamp 5W (Candelabra)	3	161,667	161,667
LED Lamp 6W (Globe)	3	18,037	18,037
LED Lamp 8W (Flood)	3	9,367	9,367
LED Lamp 9W (A Type)	3	306,034	306,034
Low-Flow Showerhead	10	1,107,134	1,107,134
Pipe Wrap	13	566,848	566,848
Smart Thermostat	11	679,756	679,756
Total	**15**	**63,916,360**	**63,916,360**

Sums may differ due to rounding.

TABLE 5-4 PY13 IQW PARTICIPATION AND INCENTIVE SUMMARY

Measure	Participation (Count of Measures)	Incentive Spend ($)
Advanced Power Strip (Tier 2)	701	$41,800
Air Infiltration	956	$565,510
Assessment	1,226	$202,170
Attic Insulation	216	$346,961
Bathroom Aerator	465	$5,100
Duct Sealing	916	$698,893
Kitchen Aerator	483	$3,395
LED Lamp 11W (A Type)	48	$2,584
LED Lamp 11W (Flood)	87	$5,224
LED Lamp 15W (Outdoor/A Type)	1	$52
LED Lamp 15W (Outdoor/PAR38)	106	$5,226
LED Lamp 5W (Candelabra)	485	$18,403
LED Lamp 6W (Globe)	60	$2,065
LED Lamp 8W (Flood)	11	$656
LED Lamp 9W (A Type)	770	$31,158
Low-Flow Showerhead	459	$8,345
Pipe Wrap	440	$2,664
Smart Thermostat	169	$31,675
Total	**7,599**	**$1,971,880**

Sums may differ due to rounding.

5.2 Program Description

The Income Qualified Weatherization (IQW) program, implemented by Frankin, offers comprehensive weatherization services to qualified low-income, single-family homes and low-rise, multi-family dwellings of four or fewer units. The program also provides comprehensive home assessments, direct install measures, as well as deeper energy efficiency upgrades when necessary. The Program's objective is to educate customers on their energy usage, identify opportunities for energy savings specific to their home, and prioritize a wide range of energy conservation measures that will allow customers to save energy.

Customers with household incomes of 200% the federal poverty level are eligible to participate in the IQW program and will receive a home energy assessment and necessary upgrades at no cost. Customers' income qualification is determined by online scheduling tool or the Energy Smart call center when scheduling home energy assessment.

5.2.1 PROGRAM DELIVERY CHANNELS AND EXPECTED SAVINGS

The evaluation approach for PY13 included the following activities: database review, desk reviews, site visits, and participant surveys.

A total of 1,574 (1,226 assessments, 6,373 measures installed) households participated in IQW. Below, Figure 5-1 shows individual measure contribution as part of the overall offering expected savings.

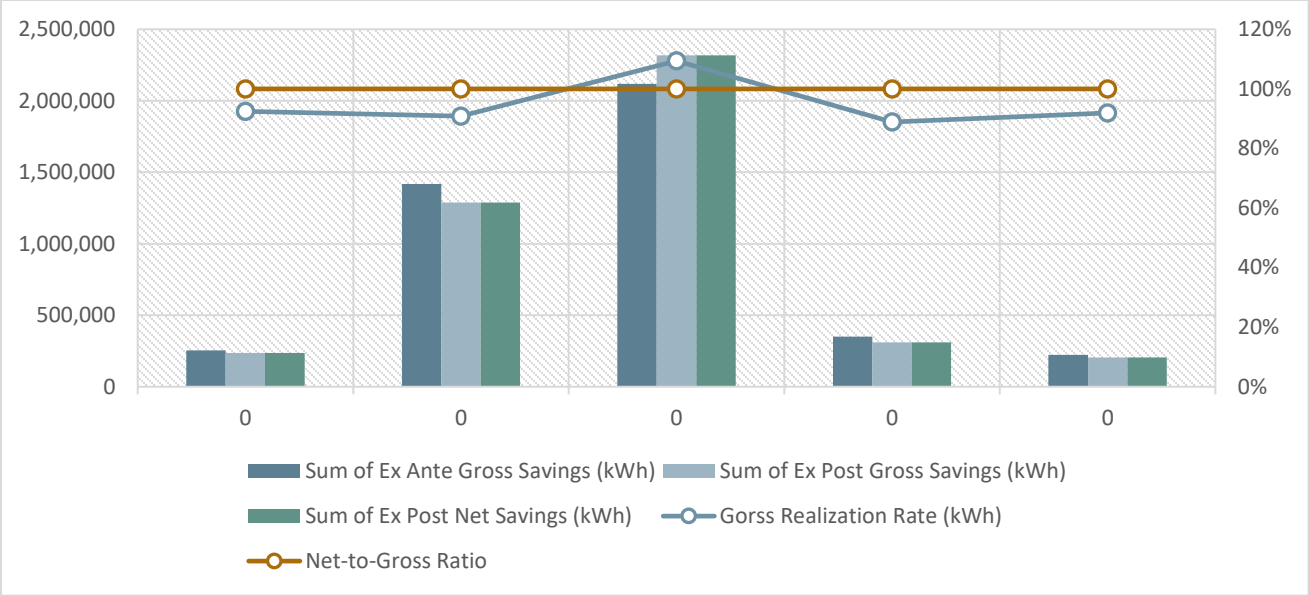


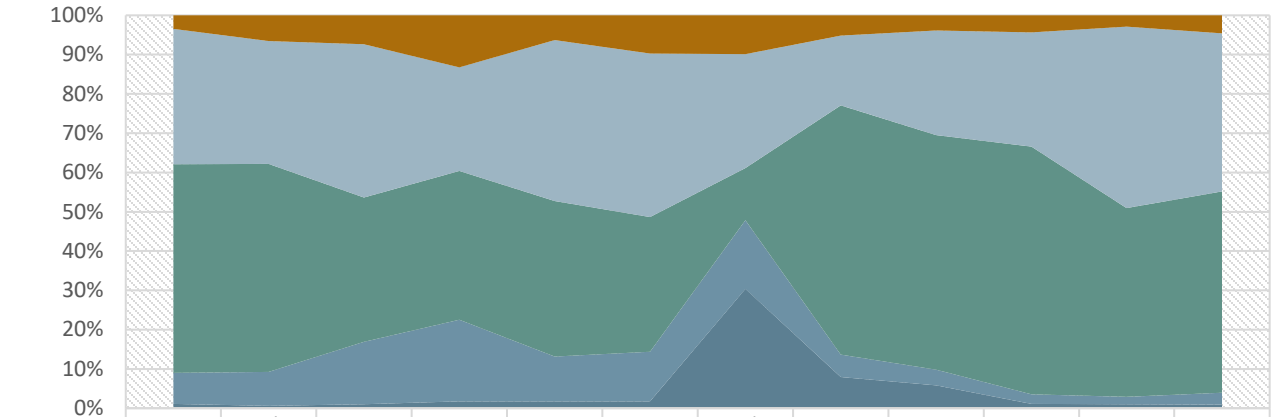
FIGURE 5-1 IQW SAVINGS CONTRIBUTION BY END USE

In PY13, the HVAC measures (smart thermostat and duct sealing) contributed 48.5% of expected energy (kWh) savings (compared to 35.7% in PY12), the envelope measures (air infiltration and attic insulation) contributed 32.5% (compared to 38.2% in PY12), the lighting measures (LED lamp) contributed 8.0% (compared to 16.9% in PY12), the appliance measures (advanced power strip) contributed 5.8% (compared to 7.8% PY12), and the hot water measures (pipe wrap, aerator, showerhead) contributed 5.1% (compared to 1.5% of expected savings in PY12). The bulk of PY13 energy savings (kWh) come from the duct sealing, air infiltration, and LED lamp projects.

Finally, in PY13 there were a total of 1,574 distinct homes accounting for 4,363,127 kWh of expected savings. Compared to PY12, there were a total of 1,230 distinct homes accounting for 3,135,817 kWh of expected savings. This accounts for a 24.5% increase in participation and a 32.7% increase in expected savings in PY13.

5.2.2 TIMING OF PROJECTS

The figure below shows *ex ante* energy savings (kWh) for IQW by end use, by month.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Appliances	10,653	21,825	20,591	30,433	19,261	14,448	37,911	31,355	15,471	20,697	14,448	17,416
Envelope	107,557	103,534	108,776	60,677	124,412	61,964	111,836	108,469	105,826	139,733	232,372	153,473
HVAC	165,896	175,581	102,666	86,861	120,296	51,027	51,141	386,632	237,777	302,977	241,819	195,247
Lighting	24,529	28,709	44,394	47,777	34,712	18,766	67,272	34,877	16,043	11,738	9,631	11,385
Water	3,434	1,986	2,735	4,048	5,227	2,588	116,940	48,445	23,150	5,117	4,950	3,620

FIGURE 5-2 *EX ANTE* SAVINGS BY END USE BY MONTH

5.2.3 TRADE ALLIES

The IQW program had 13 participating trade allies in PY13. Twelve of the reported trade allies perform weatherization work, including the following measures: duct sealing, attic insulation, air Infiltration.

Additionally, in place of trade allies, the implementer (Franklin) installs all direct install measures, including the following: advanced power strip, smart thermostat, water heater pipe wrap, aerator, low-flow showerhead, and all lighting. They performed all assessments, representing 20% of the claimed savings. The top performing TA, not Franklin, installs air infiltration, attic insulation, and duct sealing. The table below shows the distribution of savings across all trade allies and the implementer.

TABLE 5-5 IQW TRADE ALLY ACTIVITY

Trade Ally	Energy Savings (kWh)	% of Savings
TA 1	1,304,024	30%
Franklin Energy	888,663	20%
TA 3	768,916	18%
TA 4	539,453	12%
TA 5	213,345	5%
TA 6	211,708	5%
TA 7	184,026	4%
TA 8	94,250	2%
TA 9	53,334	1%
TA 10	47,073	1%
TA 11	42,431	< 1%
TA 12	5,883	< 1%
TA 13	5,357	< 1%

Sums may differ due to rounding.

5.2.4 GOAL ACHIEVEMENT

Total verified savings and percentage of goals for the IQW program are summarized in the table below.

TABLE 5-6 PY13 IQW PERFORMANCE TOWARDS GOALS AND TARGETS

Ex Post Gross Energy Savings (kWh) Goal	% to kWh Goal	Ex Post Gross Savings (kW) Target	% to kW Target
3,817,679	114%	NA	NA

Sums may differ due to rounding.

5.3 EM&V Methodology

Impact savings were calculated using methods and inputs in the NO TRM V6.1 and incorporated results from historic on-site testing where appropriate.

5.3.1 SITE VISITS

The Evaluators performed 34 site visits on projects in the IQW program. The table below outlines the measures captured in site visits.

TABLE 5-7 SITE VISIT SUMMARY

Measure	PY13 Participant Count	Found in PY13 Site Visit
Advanced Power Strip (Tier 2)	701	10
Air Infiltration	956	31
Attic Insulation	216	3
Duct Sealing	916	36
Faucet Aerator	948	24
LED Lamp	1,568	204
Low-Flow Showerhead	459	8
Smart Thermostat	169	4
Water Heater Pipe Insulation	440	9

Measure-specific findings of note are outlined in the bullets below:

- Air Infiltration: During the site visits conducted in PY13, the Evaluators' field staff conducted blower door testing in 31 homes to validate post-retrofit home leakage estimates indicated in program tracking data. The resulting average post-retrofit leakage estimate was calculated as 80.20% of expected leakage reductions. That is, of 20 homes the Evaluators found that air infiltration $CFM50_{post}$ results were 19.80% lower than those reported in tracking data. The Evaluators opted to supplement the air infiltration site visit finding with literature review results, as well as blending the findings with ISRs from the NO TRM 6.1.
- Duct Sealing: During the site visits conducted in PY13, the Evaluators' field staff conducted duct system pressurization testing in 36 homes to validate post-retrofit duct leakage estimates indicated in program tracking data. The resulting average post-retrofit leakage estimate was calculated as 98.8% of expected leakage reductions. That is, of 36 homes the Evaluators found that duct sealing $CFM25_{post}$ results were 1.20% lower than those reported in tracking data. The Evaluators opted to supplement the air infiltration site visit finding with literature review results, as well as blending the findings with ISRs from the NO TRM 6.1.

Additional measure-specific impacts were derived from the PY13 participant survey.

ISR results are presented in the table below. LED lamps and duct sealing impacts are from site visits alone; the remaining result are from the PY13 participant survey or a blended approach. All results were benchmarked against similar programs in the region to ensure they are within industry standards.

The largest barrier to scaling site visits was effective participant contact information.

5.3.2 DEEMED SAVINGS CALCULATIONS

Impact methodologies for IQW are the same as described for HPwES, described in Section 4.3.2.

5.4 Evaluation Findings

5.4.1 GROSS IMPACT FINDINGS

The followings sections outline the results of the gross impact evaluation of the IQW program.

5.4.1.1 Aerator

Expected and verified savings for PY13 IQW aerators are summarized below. There were 850 1.0 GPM bathroom aerators installed in 465 residences. There were 485 1.5 GPM kitchen aerators installed in 483 residences.

TABLE 5-8 PY13 IQW EXPECTED AND VERIFIED AERATORS SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
50,760	49,949	98.4%	5.25	5.19	99.0%

5.4.1.2 Advanced Power Strip (Tier 2)

Expected and verified savings for advanced power strips are summarized below. There were 836 advanced power strips installed at 701 residences. The slightly lower realization rate may be attributed to the measure ISR that was applied in PY13.

TABLE 5-9 PY13 IQW EXPECTED AND VERIFIED ADVANCED POWER STRIPS SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
254,508	235,268	92.4%	26.24	24.26	92.4%

5.4.1.3 Air Infiltration

Expected and verified savings for the air infiltration projects are summarized below. There were 956 air infiltration projects at the same number of residences. The slightly lower realization rate may be attributed to the measure ISR that was applied in PY13.

TABLE 5-10 PY13 IQW EXPECTED AND VERIFIED AIR INFILTRATION SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
1,043,478	936,179	89.7%	469.02	420.79	89.7%

5.4.1.4 Attic Insulation

Expected and verified savings for the attic insulation projects are summarized below. Attic insulation was installed at 184 residences.

TABLE 5-11 PY13 IQW EXPECTED AND VERIFIED ATTIC INSULATION SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
375,149	352,075	93.8%	768.28	719.09	93.6%

5.4.1.5 Duct Sealing

Expected and verified savings for duct sealing projects are summarized below. Duct sealing was installed at 916 residences.

TABLE 5-12 PY13 IQW EXPECTED AND VERIFIED DUCT SEALING SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
2,055,837	2,255,204	109.7%	687.91	759.27	110.4%

5.4.1.6 LED Lamp (Direct Install)

Expected and verified savings for LED lamps are summarized below. There were 9,581 LED lamps installed in 1,568 residences. The lower realization rate may be attributed to the measure ISR applied in PY13.

TABLE 5-13 PY13 IQW EXPECTED AND VERIFIED LEDS SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
349,833	310,921	88.9%	44.10	41.37	93.8%

5.4.1.7 Water Heater Pipe Wrap

Expected and verified savings for water heater pipe wrap projects are summarized below. Pipe wrap was installed in 440 residences. The slightly lower realization rate may be attributed to the measure ISR that was applied in PY13.

TABLE 5-14 PY13 IQW EXPECTED AND VERIFIED PIPE WRAP SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
46,763	43,604	93.2%	5.30	4.94	93.3%

5.4.1.8 Low-Flow Showerhead

Expected and verified savings for low-flow showerheads are summarized below. There were 555 low-flow showerheads installed in 459 residences.

TABLE 5-15 PY13 IQW EXPECTED AND VERIFIED SHOWERHEADS SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
124,716	110,713	88.8%	12.96	11.51	88.8%

5.4.1.9 Smart Thermostat

Expected and verified savings for smart thermostats are summarized below. There were 181 smart thermostats installed at 169 residences.

TABLE 5-16 PY13 IQW EXPECTED AND VERIFIED SMART THERMOSTATS SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
62,083	61,796	99.5%	0.00	0.00	N/A

5.4.1.10 Avoided Replacement Cost

The Evaluators have added the benefits of avoided replacement costs (ARC). The table below summarize the ARC by measure in IQW.

Information on methodology can be found in Section 3.4.1.3 Avoided Replacement Costs.

TABLE 5-17 SUMMARY OF ARC

Measure	*Ex Post* Gross ARCs ($)	*Ex Post* Net ARCs ($)	*NPV of* ARCs ($)
LED Lamp 11W (A Type)	$83	$83	$83
LED Lamp 11W (Flood)	$167	$167	$167
LED Lamp 15W (Outdoor/A Type)	$1	$1	$1
LED Lamp 15W (Outdoor/PAR38)	$103	$103	$103
LED Lamp 5W (Candelabra)	$672	$672	$672
LED Lamp 6W (Globe)	$75	$75	$75
LED Lamp 8W (Flood)	$21	$21	$21
LED Lamp 9W (A Type)	$1,327	$1,327	$1,327
Total	**$2,448**	**$2,448**	**$2,448**

Sums may differ due to rounding.

5.4.2 NET IMPACT FINDINGS

The NTG ratio is assumed to be 100% in line with common practice for estimation of low-income offering net savings, thus *ex post* net values are equal to *ex post* gross values.

Table 5-18 summarizes the program net impacts of the IQW Program.

TABLE 5-18 IQW PROGRAM NET SAVINGS

Ex Post Gross Energy Savings (kWh)	*Ex Post* Net Energy Savings (kWh)	NTG kWh	*Ex Post* Gross Demand Reductions (kW)	*Ex Post* Net Demand Reductions (kW)	NTG kW
4,355,709	4,355,709	100%	1,986.43	1,986.43	100%

Sums may differ due to rounding.

Individual measure net savings are summarized in Section 5.1 of this chapter.

5.4.3 PROCESS FINDINGS

The Evaluators conducted a full process evaluation. Table 5-19 summarizes the process evaluation activities for the IQW program.

TABLE 5-19 IQW DATA COLLECTION ACTIVITIES

Evaluation Activity	Sample Size	Impact	Process
Staff & TPI Interviews	4		X
Database Reviews	Census	X	X
Participant Surveys	72	X	X
Site Visits		X	
Desk Reviews	Census	X	

The general approach to evaluating savings for the IQW mirrors that of the HPwES program in using a combining a deem-and-count approach stratified by space heating fuel.

5.4.3.1 Staff and Implementer Interviews

The following section summarizes the key findings from in-depth interviews with two ENO program staff, one APTIM staff, and one Franklin staff; ENO staff participated in one interview and APTIM and Franklin staff participated in a second interview. These in-depth interviews aimed to learn more about HPwES program design and operations, and the successes and challenges experienced during PY13. Interviews lasted approximately 60 minutes and were conducted using the Microsoft Teams platform. The evaluators recorded all interviews with participant permission. The following narrative summarizes these interviews. Much of the findings for the program design and operations for residential programs, including IQW, are presented in Section 4.4.3.1. The following narrative summarizes findings specific to IQW.

5.4.3.1.1 *Program Description*

The program offers comprehensive weatherization services to qualified low-income, single-family homes and low-rise, multi-family dwellings of four or fewer units. The program offers comprehensive home assessments and the direct installation of measures through program staff, followed by deeper energy efficiency upgrades implemented through trade allies.

The Program's objective is to educate customers on how they are using energy, identify opportunities for energy savings specific to their home, and prioritize a wide range of energy conservation measures that will allow them to save energy immediately. The IQW offering provides customers with household incomes of 200.0% the federal poverty level with home energy upgrades at low or no cost. The offering includes a free home energy assessment performed by the implementation trade ally. Trade allies collect information to vet customers' income qualification through a series of questions.

5.4.3.1.2 *Marketing*

In addition to marketing strategies mentioned in HPwES chapter, staff have also partnered with various community groups to help promote the program and encourage residents to participate. Partners have included Vietnamese Initiatives, AmeriHealth, and Total Community Action. In the past two years, Vietnamese Initiatives have helped with translations and project lead generation of over 100 projects.

5.4.3.2 Participant Survey Findings

Evaluators conducted a survey to better understand the customer experience with the Income Qualified Weatherization program. 1,665 customers of Entergy New Orleans who participated in the Income Qualified Weatherization program were invited to complete a survey. Seventy-two participants completed the survey.

5.4.3.2.1 *Awareness and Motivations for Use*

More than a quarter of respondents learned about the IQW program through a friend or family member or through an email from Entergy (Table 5-20).

TABLE 5-20: AWARENESS (N=72)

Source	(n=72)
Friend, family member, or colleague	29.2%
Email from Entergy	29.2%
Program website	12.5%
Bill insert or utility mailer	6.9%
Home energy consultant	5.5%
Program representative	5.5%
Through an internet search or advertisement	4.2%
Contractor	1.4%
Social media post	1.4%
A radio or television advertisement	1.4%
Other	13.8%

Almost all respondents said they participated in the program to save money on energy bills (91.7%, n=66). More than 3 in 5 respondents participate in order to improve their home comfort or to help conserve energy / protect the environment (62.5%, n=45). Other motivations included improving the value of the residence, becoming as energy efficient as their friends, and as a way to obtain discounts, rebates, and free equipment (Table 5-21).

TABLE 5-21: PARTICIPATION REASONING (N=72)

Reason	(n=72)
Save money on energy bills	91.7%
Improve the comfort of your home	62.5%
Conserve energy / Protect the environment	61.1%
Improve the value of the residence	38.9%
Become as energy efficient as my friends or neighbors	33.3%
Get the free equipment/discount/rebate	33.3%
Find out if there were any structural problems with my home	22.2%

5.4.3.2.2 *Major Measure Improvements*

The most common major measure improvements received were air sealing / air filtration or duct sealing improvements (Table 5-22).

TABLE 5-22: RESPONDENTS WHO RECEIVED MAJOR MEASURE IMPROVEMENTS

Major Measure Improvement Types	Count
Air sealing / air filtration	34
Duct sealing	26
Smart thermostat	11
Attic / ceiling insulation	9

5.4.3.2.3 *Direct Installation Measure Improvements*

The two most common direct installation measures received are LED lightbulbs and advanced power strips (Table 5-23). Most respondents have not removed the direct install measures they received.

TABLE 5-23 DIRECT INSTALL MEASURES

Direct Installation Measure Improvement Types	Count
LED lightbulbs	36
Advanced Power Strips	36
Bathroom Aerators	12
Kitchen Aerators	12
Showerheads	10
Water Heater Pipe Wrap	6

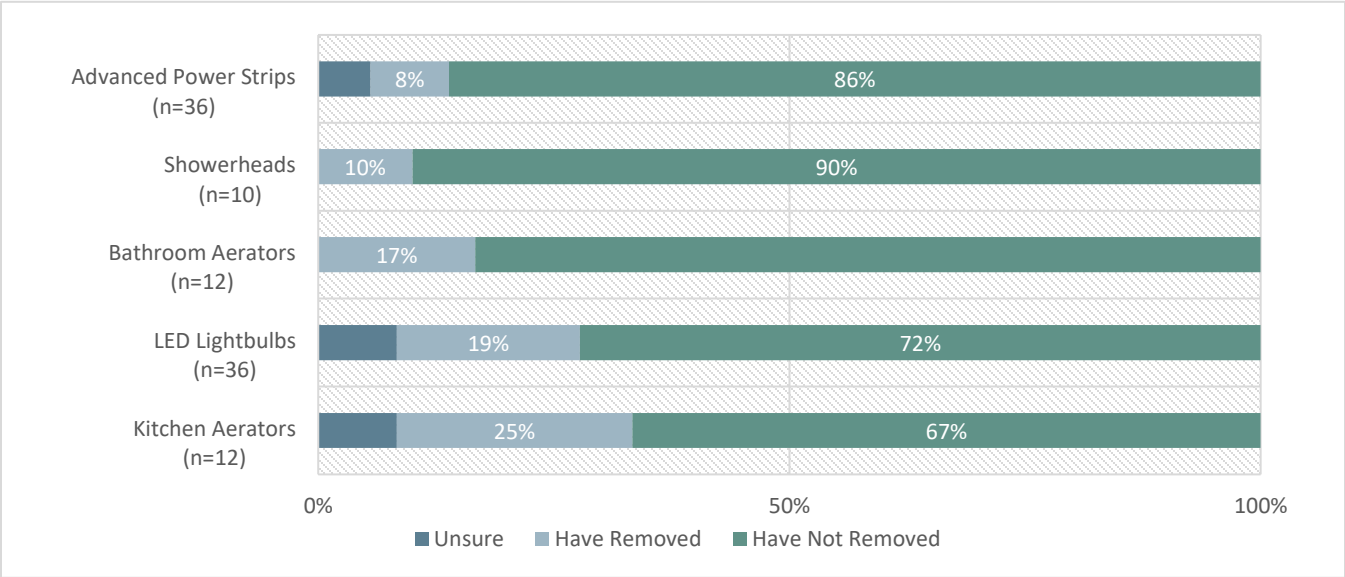


FIGURE 5-3 DIRECT INSTALL REMOVAL RATES (106 PRODUCTS)

Respondents who removed LED lamps indicated the lights were either too dim, stopped working, or didn't fit (Table 5-24).

TABLE 5-24 REASON FOR LED REMOVAL (N=7)

Reasons for Removing	LED (n=7)
Too dim	28.6%
Stopped working	14.3%
Didn't fit	14.3%
Didn't want	14.3%
Other	28.6%

One respondent removed a bathroom aerator because not enough water came out; one person removed the showerhead for the same reason. Two of the three respondents who received kitchen aerators said they removed them because they did not work properly.

TABLE 5-25 WATER EQUIPMENT REMOVAL (N=6)

Reasons for Removing	Bathroom Aerators (n=2)	Kitchen Aerators (n=3)	Showerheads (n=1)
Not enough water came out	50.0%	--	100.0%
Did not like the way they looked	--	--	100.0%
Damaged / Didn't work properly	--	66.7%	--
Other	50.0%	33.3%	--

Respondents report removing APS due to misplacing it (n=1), lack of interest (n=1) and issues powering it (n=1) (Table 5-26).

TABLE 5-26: APS REMOVAL (N=3)

Reason for Removing	Advanced Power Strips (n=3)
Misplaced	33.3%
Not interested in it	33.3%
Issues with powering other devices	33.3%

Respondents most often use their APS to power their televisions. More than a quarter are not using their APS.

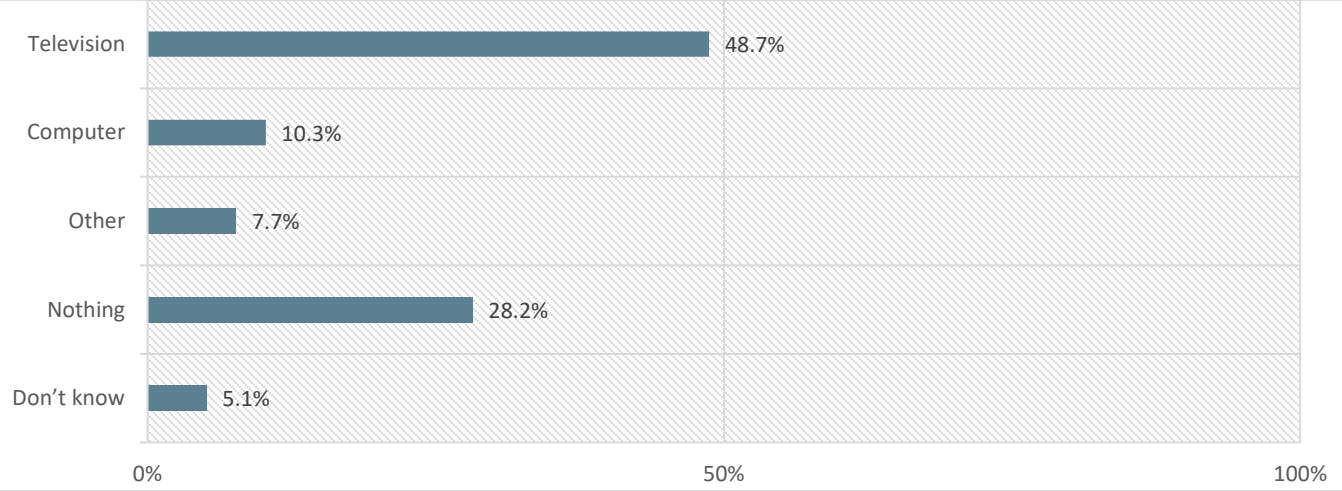


FIGURE 5-4: APS USES (N=39)

5.4.3.2.4 *Home Energy Assessments*

Forty-seven respondents received home assessments. Four out of five respondents say that scheduling a home energy assessment is easy or very easy (80.9%, n=38).

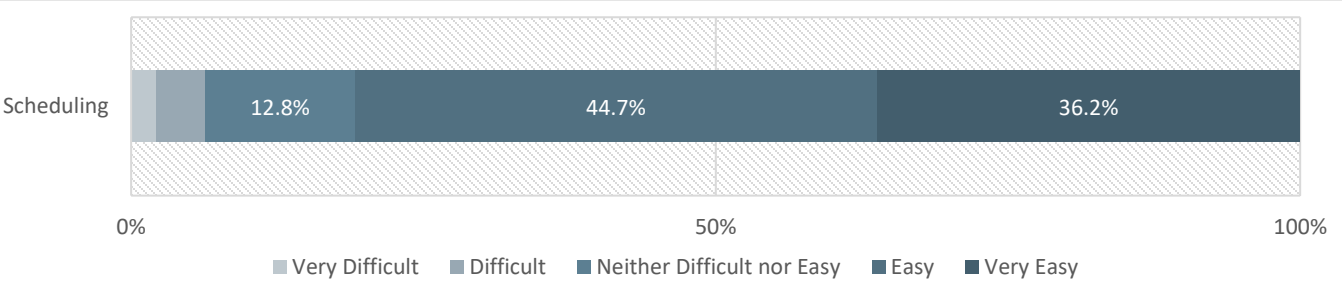


FIGURE 5-5: SCHEDULING APPOINTMENT (N=47)

More than half of respondents reported they were given an energy efficiency report with recommendations and an estimate of cost savings that could be expected (61.7%, n=29).

Most reported that energy efficiency measures were completed on that day (61.7%, n=29) and less than half who received an assessment were not asked if they had any specific issues with their home they wanted addressed by their assessor (40.4%, n=19). More than 80% of respondents who received an assessment found the report helpful (82.7%, n=39). Almost 70% have made at least some of the recommended improvements (Table 5-27).

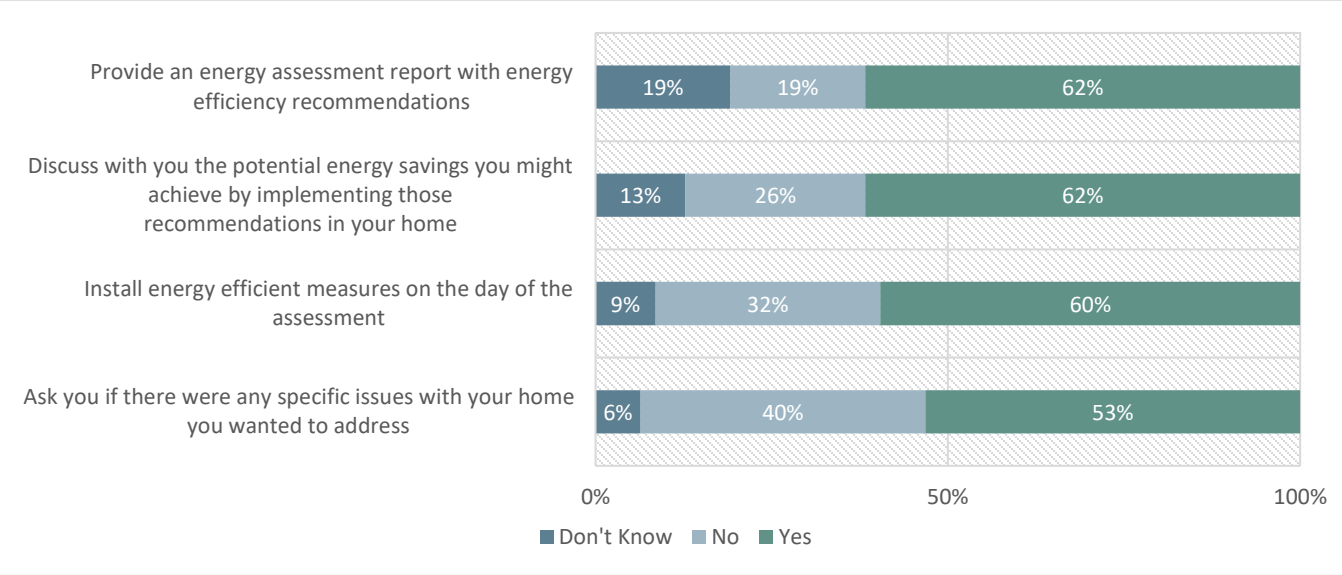


FIGURE 5-6 ENERGY ASSESSMENT BEHAVIORS (N=47)

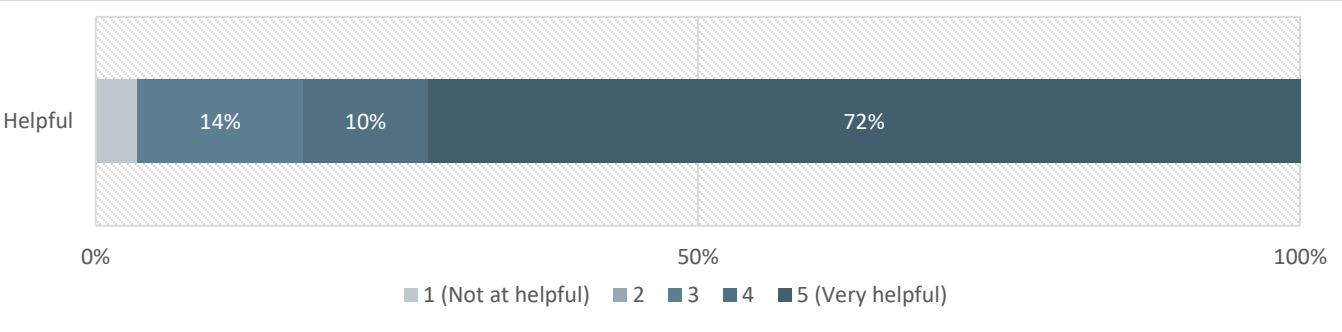


FIGURE 5-7 REPORT HELPFULNESS (N=47)

TABLE 5-27 IMPROVEMENTS MADE FROM ASSESSMENT (N=47)

Reason	Received Assessment (n=47)
Made all	27.7%
Made some but not all	40.4%
Have not made any	21.3%
Don’t know	10.6%

For those who did not make the recommended improvements, cost was the reason more than half the time (58.6%). About 60% plan to implement the recommended improvements in the future.

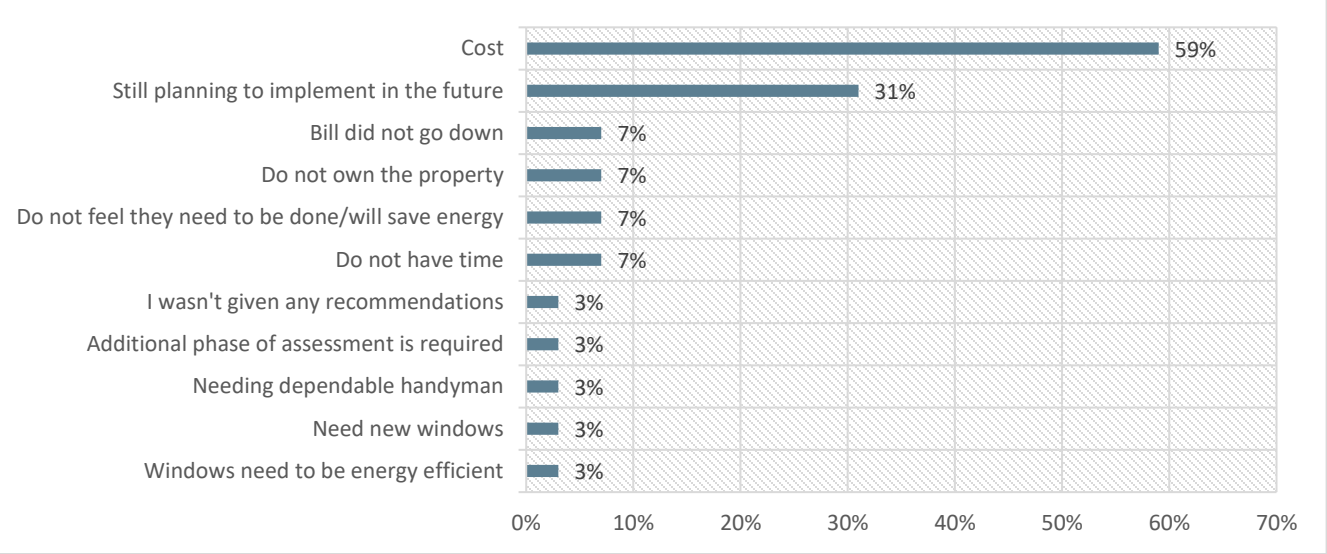


FIGURE 5-8 REASONING FOR NOT MAKING IMPROVEMENTS (N=29)

5.4.3.2.5 *Satisfaction*

While respondents are at least somewhat satisfied with most aspects of the program, less than half are satisfied with the savings on their monthly utility bills. A third of respondents were dissatisfied with Entergy as their service provider (33.3%, n=24).

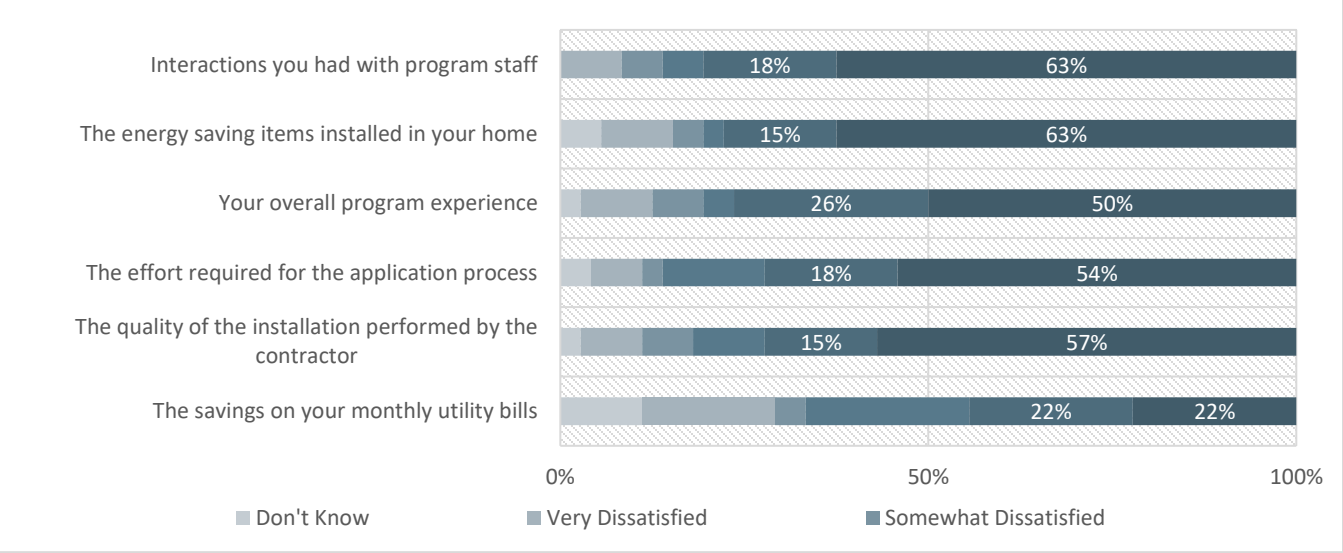


FIGURE 5-9 PROGRAM SATISFACTION (N=72)

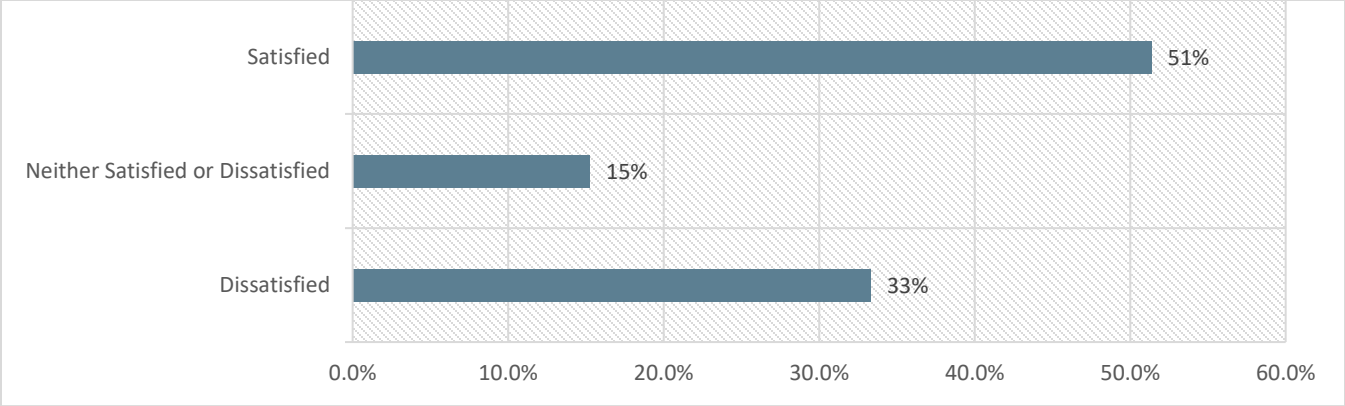


FIGURE 5-10 SATISFACTION WITH ENTERGY (N=72)

5.5 Data Tracking Review

The Evaluators reviewed the implementer-provided tracking data and noted that the fields that were missing in PY13 data were generally present in PY13. The following bullets outline notes from reviewing the IQW data:

- Trade ally information: In general, Trade Ally primary contact names, company names, contact phone numbers, and email addresses were provided in PY13 data, however, there were a handful of projects that were missing these fields:
  - Trade ally primary contact name: 64 projects in 33 distinct homes (33 out of 1,574 homes)
    - Emails were included in contact names: 6,191 projects (1,295 out of 1,574)
  - Trade ally main phone number: 8 projects (3 homes out of 1,574)
  - Trade ally email address: 106 projects (58 homes out of 1,574)
- Participant information: In general, participant contact names, contact phone numbers, and email addresses were provided in PY13 data, however, there were many projects that were missing these fields:
  - Participant main phone number: 8 projects in 3 distinct homes (3 out of 1,574)
  - Participant email address: 1,170 projects in 216 distinct homes (216 out of 1,574)
- Measure-level parameters: the following is an outline of missing or problematic parameters needed for savings calculations by measure:
  - Duct sealing: there were 10 projects unique by address that had problematic SEER values that were < 9 or > 100.

5.6 Findings and Recommendations

Findings and Conclusions:

- Motivation for Participation: The evaluation revealed that the primary reason for customer participation in the IQW program is to save money on energy bills. However, satisfaction with monthly utility bill savings is below expectations for fewer than half of respondents.
- Effectiveness of Direct Installation Measures: While most direct installation measures are effective, there are instances where they do not function properly or are not needed or understood by the customer.

Recommendations:

- Implement HPwES Recommendations: Considering the similarities in design and issues between the HPwES and IQW programs, it is recommended to explore opportunities to implement recommendations from the HPwES program evaluation. This could include developing a customer journey map and ensuring prompt customer follow-up to enhance program effectiveness.

6 RETAIL LIGHTING AND APPLIANCE

6.1 Summary

The tables below report *ex ante* gross, *ex post* gross, *ex post* net energy savings (kWh) (both annual and lifetime), demand reductions (kW), participation, and incentive spend, by measure, where applicable.

TABLE 6-1 PY13 RLA ENERGY SAVINGS (KWH)

Measure	Ex Ante Gross Savings (kWh)	Realization Rate (kWh)	Ex Post Gross Savings (kWh)	NTG	Ex Post Net Savings (kWh)
Advanced Power Strip (Tier 1)	7,042	81.9%	5,766	81.2%	4,684
Advanced Power Strip (Tier 2)	922	81.9%	755	81.2%	613
Air Purifier	3,041	91.2%	2,774	73.4%	2,037
Bathroom Aerator	4,511	78.8%	3,553	92.0%	3,269
Dehumidifier	2,784	72.9%	2,030	100.0%	2,030
ENO Generic Marketplace DR	0	100.0%	0	100.0%	0
Freezer	104	100.0%	104	64.5%	67
Heat Pump Water Heater	6,646	103.3%	6,863	75.4%	5,173
Kitchen Aerator	1,876	78.8%	1,477	92.0%	1,359
LED Lamp (Marketplace)	316,277	88.0%	278,347	80.5%	224,069
LED Lamp (Upstream)	6,088,074	97.1%	5,911,942	68.9%	4,075,818
Low-Flow Showerhead	22,344	93.6%	20,919	94.0%	19,664
Pipe Wrap	3,925	76.4%	3,000	84.3%	2,528
Pool Pump	19,017	98.7%	18,776	100.0%	18,776
Power Connector	0	100.0%	0	100.0%	0
Refrigerator	8,924	78.8%	7,031	71.9%	5,053
Smart Thermostat	721,329	91.1%	657,260	85.2%	560,008
Trim Kit	0	100.0%	0	100.0%	0
Wall Plate	0	100.0%	0	100.0%	0
Window AC	6,271	97.0%	6,080	71.4%	4,344
Wire Kit	0	100.0%	0	100.0%	0
Total	**7,213,086**	**96.0%**	**6,926,676**	**71.2%**	**4,929,492**

Sums may differ due to rounding.

TABLE 6-2 PY13 RLA DEMAND REDUCTIONS (KW)

Measure	Ex Ante Gross Reductions (kW)	Realization Rate (kW)	Ex Post Gross Reductions (kW)	NTG	Ex Post Net Reductions (kW)
Advanced Power Strip (Tier 1)	0.81	81.9%	0.66	81.2%	0.54
Advanced Power Strip (Tier 2)	0.09	81.9%	0.08	81.2%	0.06
Air Purifier	0.35	91.2%	0.32	73.4%	0.23
Bathroom Aerator	0.46	79.5%	0.37	92.0%	0.34
Dehumidifier	0.63	73.2%	0.46	100.0%	0.46
ENO Generic Marketplace DR	0.00	100.0%	0.00	100.0%	0.00
Freezer	0.02	100.3%	0.02	64.5%	0.01
Heat Pump Water Heater	0.58	103.3%	0.60	75.4%	0.45
Kitchen Aerator	0.20	78.4%	0.15	92.0%	0.14
LED Lamp (Marketplace)	38.76	102.2%	39.64	80.5%	31.91
LED Lamp (Upstream)	1,033.97	97.1%	1,004.18	68.9%	692.30
Low-Flow Showerhead	2.32	93.7%	2.18	94.0%	2.05
Pipe Wrap	0.45	76.4%	0.34	84.3%	0.29
Pool Pump	3.68	100.1%	3.69	100.0%	3.69
Power Connector	0.00	100.0%	0.00	100.0%	0.00
Refrigerator	1.29	79.3%	1.02	71.9%	0.74
Smart Thermostat	0.00	100.0%	0.00	85.2%	0.00
Trim Kit	0.00	100.0%	0.00	100.0%	0.00
Wall Plate	0.00	100.0%	0.00	100.0%	0.00
Window AC	3.77	96.2%	3.63	71.4%	2.59
Wire Kit	0.00	100.0%	0.00	100.0%	0.00
Total	**1,087.39**	**97.2%**	**1,057.33**	**71.2%**	**735.80**

Sums may differ due to rounding.

TABLE 6-3 PY13 RLA LIFETIME SAVINGS SUMMARY

Measure	EUL	Ex Post Gross Lifetime Energy Savings (kWh)	Ex Post Net Lifetime Energy Savings (kWh)
Advanced Power Strip (Tier 1)	10	57,657	46,843
Advanced Power Strip (Tier 2)	10	7,551	6,135
Air Purifier	9	24,963	18,331
Bathroom Aerator	10	35,530	32,688
Dehumidifier	12	24,314	305,150
ENO Generic Marketplace DR	1	0	0
Freezer	22	2,282	1,472
Heat Pump Water Heater	10	68,633	51,732
Kitchen Aerator	10	14,775	13,593
LED Lamp (Marketplace)	3	695,868	560,174
LED Lamp (Upstream)	3	14,779,854	10,189,544
Low-Flow Showerhead	10	209,191	196,640
Pipe Wrap	13	39,002	32,859
Pool Pump	10	187,756	187,756
Power Connector	1	0	0
Refrigerator	17	119,519	85,904
Smart Thermostat	11	7,229,855	6,160,091
Trim Kit	1	0	0
Wall Plate	1	0	0
Window AC	11	63,842	45,612
Wire Kit	1	0	0
Total	**3**	**23,560,592**	**17,934,522**

Sums may differ due to rounding.

TABLE 6-4 PY13 RLA COUNT OF MEASURES AND INCENTIVE SPEND

Measure	Participation (Count of Measures)	Incentive Spend ($)
Advanced Power Strip (Tier 1)	107	$1,872
Advanced Power Strip (Tier 2)	3	$150
Air Purifier	8	$225
Bathroom Aerator	56	$101
Dehumidifier	19	$475
ENO Generic Marketplace DR	188	$9,400
Freezer	3	$75
Heat Pump Water Heater	9	$3,600
Kitchen Aerator	49	$140
LED Lamp (Marketplace)	977	$17,238
LED Lamp (Upstream)	2,785	$383,251
Low-Flow Showerhead	78	$790
Pipe Wrap	61	$620
Pool Pump	7	$2,100
Power Connector	6	$0
Refrigerator	127	$6,350
Smart Thermostat	1,654	$204,227
Trim Kit	60	$0
Wall Plate	44	$0
Window AC	75	$3,950
Wire Kit	7	$0
Total	**6,323**	**$634,564**

Sums may differ due to rounding.

6.2 Program Description

The Retail Lighting & Appliances Program (RLA) provides retail markdown incentives for efficiency lighting as well as end-user incentives for window air conditioners, high efficiency refrigerators, and other appliances.

The RLA is managed by Franklin. The RLA offering provides Point-of-Purchase (PoP) discounts for LED lamp), as well as mail-in rebates (downstream rebates) for air purifiers, dehumidifiers, refrigerator, freezer, window AC, pool pump, smart thermostat, water coolers, and heat pump water heater. These are available through an online marketplace and through participating retailers. A complete list of eligible items is listed below:

- Giveaway LED Lamp (9W A19)
- Indoor LED Lamp (Specialty)
- Indoor LED Lamp (Standard)
- Outdoor LED Lamp (Specialty)
- ENERGY STAR Air Purifier
- ENERGY STAR Dehumidifier
- ENERGY STAR Smart Thermostat
- ENERGY STAR Pool Pump
- ENERGY STAR Dehumidifier
- ENERGY STAR Water Cooler
- ENERGY STAR Window AC
- ENERGY STAR Heat Pump Water Heater
- ENERGY STAR Freezer
- Refrigerator Replacement
- Online Marketplace (OLM) measures:
    - Advanced Power Strip (Tier 1)
    - Aerator (1.0 GPM)
    - Aerator (1.5 GPM)
    - Pipe Insulation
    - Showerhead (1.5 GPM)
    - Smart Thermostat
    - Smart Thermostat Accessories

6.2.1 PROGRAM DELIVERY CHANNELS AND EXPECTED SAVINGS

The evaluation approach for PY13 included the following activities: database review, desk reviews, participant surveys, and staff interviews.

A total of 2,021 distinct households (6,323 measures) participated in RLA. Below, Figure 5-1 shows end use contribution as part of the overall expected savings.

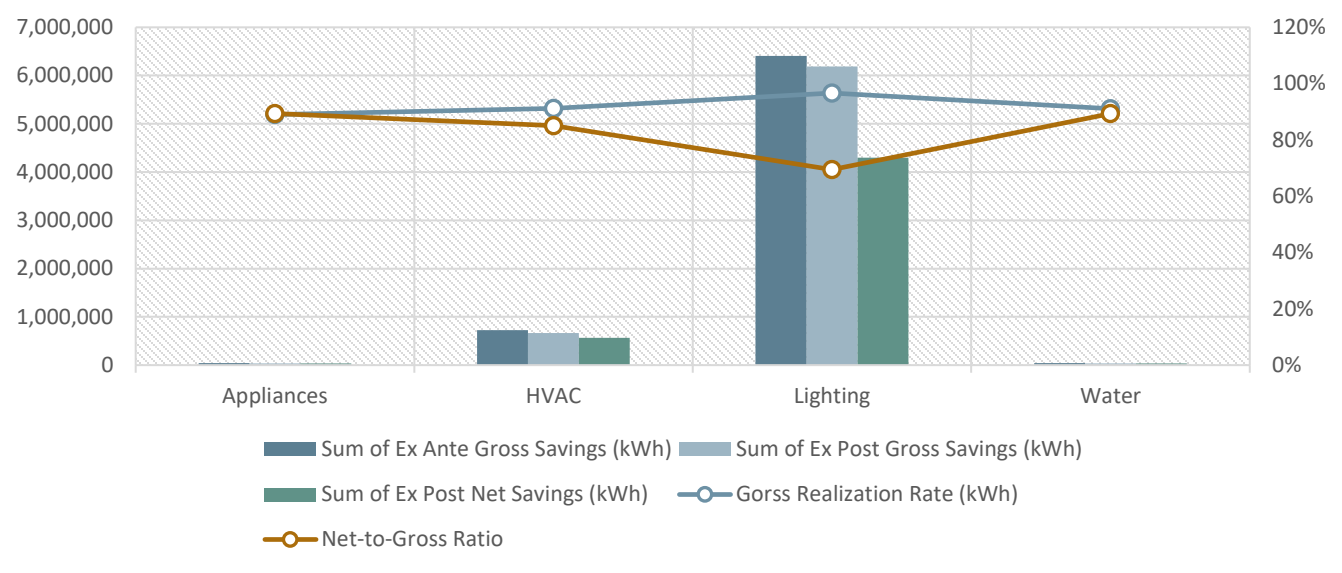
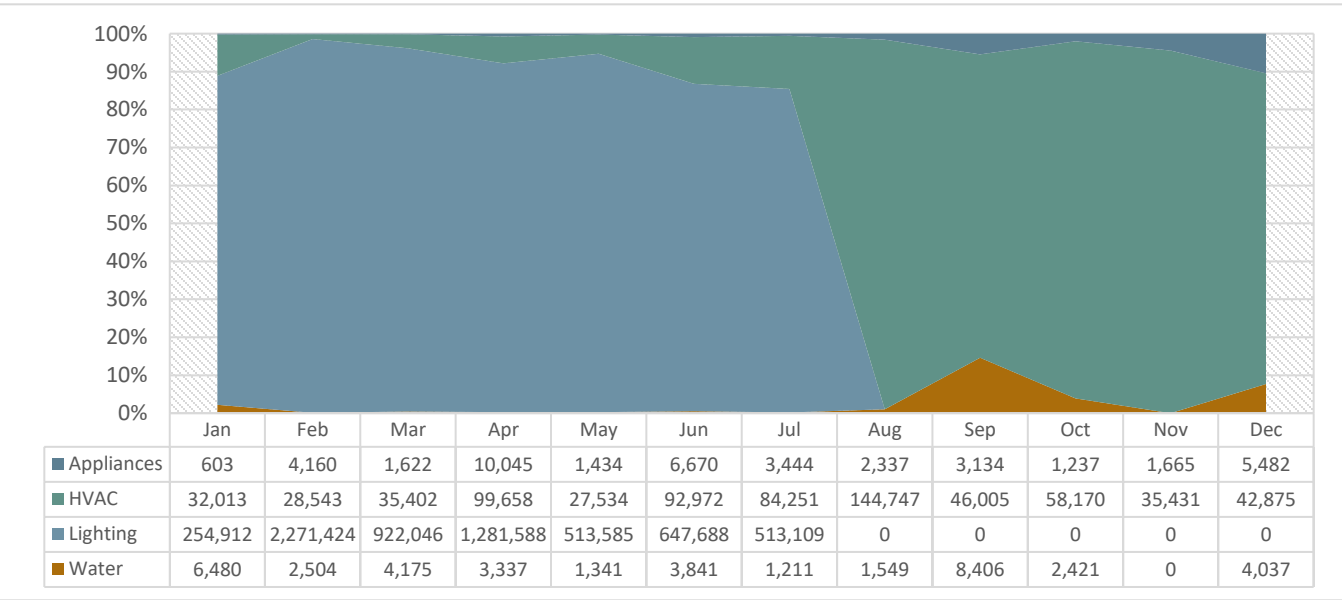


FIGURE 6-1 RLA SAVINGS CONTRIBUTION BY END USE

In PY13, the lighting measures (LED lamp) contributed 88.8% of expected energy (kWh) savings (compared to 89.9% in PY13), the HVAC measures (smart thermostat and window AC) contributed 10.1% (compared to 9.6% in PY13), the appliance measures (advanced power strip, water cooler, dehumidifier, pool pumps) contributed 0.6% (compared to 0.3% in PY13), and the hot water measures (pipe wrap, aerator, showerhead) contributed 0.5% (compared to 0.2% of expected energy savings in PY13). Most savings were from LED lamp and smart thermostat measures (98.8%).

6.2.2 TIMING OF PROJECTS

The figure below shows *ex ante* energy savings (kWh) for RLA by end use, by month.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Appliances	603	4,160	1,622	10,045	1,434	6,670	3,444	2,337	3,134	1,237	1,665	5,482
HVAC	32,013	28,543	35,402	99,658	27,534	92,972	84,251	144,747	46,005	58,170	35,431	42,875
Lighting	254,912	2,271,424	922,046	1,281,588	513,585	647,688	513,109	0	0	0	0	0
Water	6,480	2,504	4,175	3,337	1,341	3,841	1,211	1,549	8,406	2,421	0	4,037

FIGURE 6-2 *EX ANTE* SAVINGS BY END USE BY MONTH

LED lighting is not all distributed in January. Project data indicates that all LED lighting occurred in February and May, with a significant drop after July 2023. This may be have been an effort to complete lighting projects before the EISA backstop enforcement took effect in July 1st, 2023.

6.2.3 TRADE ALLIES

There are no trade allies in the program. Measures are distributed through an online marketplace (OLM), participating retailer mark-downs, and mail-in-rebates.

6.2.4 GOAL ACHIEVEMENT

Total verified savings and percentage of goals are summarized in the table below.

TABLE 6-5 PY13 RLA SUMMARY OF GOAL ACHIEVEMENT

Ex Post Gross Energy Savings (kWh) Goal	% to kWh Goal	Ex Post Gross Savings (kW) Target	% to kW Target
7,997,811	87%	NA	NA

6.3 EM&V Methodology

RLA has received impact and process evaluations in PY13. The evaluations provided free-ridership estimates, discussions of program satisfaction and strategic recommendations for program improvement, and most/all measures offered by the program have deemed TRM savings. In the initial review of the PY13 program, the Evaluators concluded that RLA did not warrant more than a brief overview of program activity.

Impact methodologies for most RLA measures are the same as described for HPwES, described in Section 4.3.1. The following section discusses savings calculation methods for measures not covered in the HPwES chapter.

TABLE 6-6 RLA DATA COLLECTION ACTIVITIES

Evaluation Activity	Sample Size	Impact	Process
Staff & TPI Interviews	4		X
Database Review	Census	X	X
Desk Reviews	Census	X	
Literature Reviews		X	
Appliance Rebate Survey	30	X	X

6.3.1 SITE VISITS

The nature of upstream programs limits the potential for site visits. To estimate installation rates for each measure, the Evaluators performed participant surveys, literature reviews, and the NO TRM V6.1. Dehumidifiers, LED lamps, pool pumps, smart thermostats, water coolers, and window AC impacts were derived from the participant survey; the remaining results were a blended approach.

6.3.2 DEEMED SAVINGS CALCULATION

6.3.2.1 Heat Pump Water Heater (HPWH)

HPWH savings were calculated using the savings methodology from the NO TRM V6.1, Section 1.2.1.4.2. The following equations outline the methodology that the Evaluators adhered to.

$$kWh_{Savings} = \frac{\rho \times C_p \times V \times (T_{SetPoint} - T_{Supply}) \times \left(\frac{1}{EF_{pre}} - \left(\frac{1}{(EF_{post} \times (1 + PA\%)} \times Adj\right)\right)}{3{,}412\ Btu/kWh}$$

$$kW_{savings} = kWh_{savings} \times Ratio\ ^{Peak\ kW}_{Annual\ kWh}$$

Where:

ρ = Water density = 8.33 lb/gal

C_p = Specific heat of water = 1 BTU/ lb · °F

V = Estimated annual hot water use (gal)

$T_{SetPoint}$ = Water heater set point = 123.61 °F

T_{Supply} = Average New Orleans area supply water temperature = 74.8 °F

EF_{pre} = Baseline uniform energy factor value

EF_{post} = Actual uniform energy factor value of efficient HPWH

$PA\%$ = Performance Adjustment to adjust the HPWH EF relative to ambient air temperature[7]

Adj = HPWH-specific adjustment factor to account for cooling bonus and heating penalty

$3{,}412$ = conversion factor to convert BTU to kWh

6.3.2.2 Window AC Replacement

Savings for window air conditioners were calculated using the savings methodology from the NO TRM V6.1, Section 1.3.2.4.

$$kWh_{Savings} = CAP_c \times \frac{1\ \text{kW}}{1{,}000\ \text{W}} \times \left(\frac{1}{CEER_{base}} - \frac{1}{CEER_{Eff}}\right) \times EFLH_C \times RAF$$

$$kW_{Reductions} = CAP_c \times \frac{1}{1{,}000}\ ^{W}/_{kW} \times \left(\frac{1}{CEER_{base}} - \frac{1}{CEER_{Eff}}\right) \times \%CF$$

Where:

CAP_c = Cooling capacity in BTU

$CEER_{base}$ = Combined energy-efficiency ratio of baseline equipment

$CEER_{Eff}$ = Combined energy-efficiency ratio of efficient equipment

$EFLH_C$ = Equivalent Full Load Hours – cooling (1,637)

RAF = Room AC adjustment factor = 0.49

CF = Peak coincidence factor = 0.77

[7] Per DOE guidance, $PA\% = 0.00008 \times T_{amb}^3 + 0.0011 \times T_{amb}^2 - 0.4833 \times T_{amb} + 0.0857$

6.3.2.3 Deemed Savings for Other RLA Measures

For remaining measures, the Evaluators used the following NO TRM V6.1 sections and tables to verify savings. The sections are outline in Table 6-7 below.

TABLE 6-7 NO TRM V6.1 SECTIONS FOR OTHER MEASURES

Measure	TRM Section	Calculated / Deemed	TRM Table(s)	Table Page(s)
Dehumidifiers	1.1.8	Deemed	Table 1-21, 1-22	42
Pool Pumps	1.1.8.7*	Deemed	Table 1-24, 1-25	44
Refrigerators	1.1.9	Deemed	Table 1-28	49
Water Coolers	1.1.4	Deemed	Table 1-9	29

* The NO TRM V6.1 lists Pool Pumps in Section 1.1.8.7.

Section 6.1 Summary presents the results of the evaluation for the RLA program by measure.

6.3.3 GROSS IMPACT FINDINGS

6.3.3.1 Aerator (Bathroom and Kitchen)

Expected and verified savings for aerators are summarized below. 101 1.0 GPM bathroom aerators were installed in 56 homes, while 70 1.50 GPM kitchen aerators were installed in 49 homes. The slightly lower realization rate may be attributed to the measure ISR applied in PY13.

TABLE 6-8 PY13 RLA EXPECTED AND VERIFIED AERATORS SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
6,387	5,030	78.8%	0.66	0.52	79.2%

6.3.3.2 Advanced Power Strip

Expected and verified savings for APS are summarized below. There were 144 APS Tier 1 advanced power strips installed in 107 homes, while there were three Tier 2 APS installed in three homes. The slightly lower realization rate may be attributed to the measure ISR applied in PY13.

TABLE 6-9 PY13 RLA EXPECTED AND VERIFIED ADVANCED POWER STRIPS SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
7,964	6,521	81.9%	0.90	0.74	81.9%

6.3.3.3 Dehumidifier

Expected and verified savings for dehumidifiers are summarized below. There were nineteen (19) dehumidifiers that were installed in nineteen (19) homes. The lower realization rate may be attributed to the measure ISR that was applied in PY13.

TABLE 6-10 PY13 RLA EXPECTED AND VERIFIED DEHUMIDIFIER SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
2,784	2,030	72.9%	0.63	0.46	73.2%

6.3.3.4 Freezer (Replacement)

ENERGY STAR Freezer savings were calculated using the deemed savings from the NO TRM V6.1 Section 1.1.10.1. After verifying model configurations and features, deemed savings were assigned to each unit using TRM. There were a total of three (3) replacements.

TABLE 6-11 PY13 RLA EXPECTED AND VERIFIED FREEZER REPLACEMENT SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
104	104	100.0%	0.02	0.02	100.3%

6.3.3.5 Heat Pump Water Heater

Expected and verified savings for heat pump water heaters are summarized below. There were nine (9) heat pump water heaters incentivized.

TABLE 6-12 PY13 RLA EXPECTED AND VERIFIED HPWH SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
6,646	6,863	103.3%	0.58	0.60	103.3%

6.3.3.6 LED Lamp (OLM and Upstream)

Expected and verified savings for LED lamps are summarized below. There were 8,122 online marketplace lamps installed in 977 homes, while there were 193,453 upstream lamps sold.

TABLE 6-13 PY13 RLA EXPECTED AND VERIFIED LED SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
6,404,351	6,190,289	96.7%	1,072.73	1,043.81	97.3%

6.3.3.7 Water Heater Pipe Wrap

Expected and verified savings for pipe wrap projects are summarized below. Pipe wrap was installed at 61 residences. The lower realization rate may be attributed to the measure ISR that was applied in PY13.

TABLE 6-14 PY13 RLA EXPECTED AND VERIFIED PIPE WRAP SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
3,925	3,000	76.4%	0.45	0.34	76.4%

6.3.3.8 Pool Pump

Expected and verified savings for pool pumps are summarized below. There were seven (7) pool pumps incentivized.

TABLE 6-15 PY13 RLA EXPECTED AND VERIFIED POOL PUMPS SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
19,017	18,776	98.7%	3.68	3.69	100.1%

6.3.3.9 Refrigerator (Replacement)

ENERGY STAR Refrigerator savings were calculated using the deemed savings from the NO TRM V6.1 Section 1.1.4.1. After verifying model configurations and features, deemed savings were assigned to each unit using TRM. Expected and verified savings for refrigerators are summarized below. There were 127 replacements. The lower realization rate may be attributed to differences in verified make / model configurations, resulting in differences in savings calculations.

TABLE 6-16 PY13 RLA EXPECTED AND VERIFIED REFRIGERATORS SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
8,924	7,031	78.8%	1.29	1.02	79.3%

6.3.3.10 Low-Flow Showerhead

Expected and verified savings for low-flow showerheads are summarized below. There were 98 showerheads installed in 78 residences.

TABLE 6-17 PY13 RLA EXPECTED AND VERIFIED SHOWERHEAD SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
22,344	20,919	93.6%	2.32	2.18	93.7%

6.3.3.11 Smart Thermostat

Savings for smart thermostats were calculated using the savings methodology from the NO TRM V6.1, Section 1.3.9. Expected and verified savings for smart thermostats are summarized below. There were 1,501 smart thermostats incentivized through the OLM, 153 incentivized through a mail-in-rebate.

TABLE 6-18 PY13 RLA EXPECTED AND VERIFIED SMART THERMOSTATS SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
721,329	657,260	91.1%	0.00	0.00	100.0%

6.3.3.12 Air Purifier

Savings for air purifiers were calculated using the savings methodology from the NO TRM V6.1, Section C.1.4.4. Expected and verified savings for water coolers are summarized below. There were nine (9) purifiers installed in nine (9) homes. The lower realization rate may be attributed to the measure ISR that was applied in PY13.

TABLE 6-19 PY13 RLA EXPECTED AND VERIFIED AIR PURIFIER SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
3,041	2,774	91.2%	0.35	0.32	91.2%

6.3.3.13 Window Air Conditioner

Savings for window air conditioners were calculated using the savings methodology from the NO TRM V6.1, Section 1.3.2.4. Expected and verified savings for window air conditioners are summarized below. There were 79 units installed in 75 residences.

TABLE 6-20 PY13 RLA EXPECTED AND VERIFIED WINDOW AC SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
6,271	6,080	97.0%	3.77	3.63	96.2%

6.3.3.14 Avoided Replacement Cost

The Evaluators have added the benefits of avoided replacement costs (ARC). The table below summarizes the ARC by measure in RLA. Information on methodology can be found in Section 3.4.1.3 Avoided Replacement Costs.

TABLE 6-21 PY13 RLA SUMMARY OF AVOIDED REPLACEMENT COST

Measure	Ex Post Gross ARC ($)	Ex Post Net ARC ($)	NPV ARC ($)
Advanced Power Strip (Tier 1)	$0	$0	$0
Advanced Power Strip (Tier 2)	$0	$0	$0
Air Purifier	$0	$0	$0
Bathroom Aerator	$0	$0	$0
Dehumidifier	$0	$0	$0
ENO Generic Marketplace DR	$0	$0	$0
Freezer	$0	$0	$0

Heat Pump Water Heater	$0	$0	$0
Kitchen Aerator	$0	$0	$0
LED Lamp (Marketplace)	$2,190	$1,510	$1,510
LED Lamp (Upstream)	$55,852	$38,505	$38,505
Low-Flow Showerhead	$0	$0	$0
Pipe Wrap	$0	$0	$0
Pool Pump	$0	$0	$0
Power Connector	$0	$0	$0
Refrigerator	$0	$0	$0
Smart Thermostat	$0	$0	$0
Trim Kit	$0	$0	$0
Wall Plate	$0	$0	$0
Window AC	$0	$0	$0
Wire Kit	$0	$0	$0
Total	**$58,042**	**$40,015**	**$40,015**

Sums may differ due to rounding.

6.3.4 NET IMPACT FINDINGS

The table summarizes NTG results by measure and the source of the impact. The source is primarily the participant survey, and where there is low or no response rates, the Evaluators performed literature reviews. The literature review-based net-to-gross values include spillover savings if it occurred in the referenced studies. ADM assigned a spillover ratio 0f 0.4% associated with smart thermostat RLA customers.

TABLE 6-22 RLA NET IMPACTS

Measure	NTG	Source of Net-to-Gross
1.0 Bathroom Aerator	92.0%	Literature review
1.5 Kitchen Aerator	92.0%	Literature review
1.5 Showerhead	94.0%	Literature review
ENERGY STAR Dehumidifier	100.0%	PY13 Participant Survey
OLM LED Lamp	74%	Literature review
Upstream LED Lamp	58%	Literature review
Heat Pump Water Heater	74.3%	Literature review
Pipe Insulation	88.0%	Literature review
ENERGY STAR Pool Pump	100.0%	PY13 Participant Survey
Refrigerator Replacement	86.6%	PY13 Participant Survey
Smart Thermostat	86.5%	PY13 Participant Survey
Advanced Power Strip (Tier 1)	72.0%	Literature review
Water Cooler	53.0%	Literature review
Window Air Conditioner	73.0%	PY13 Participant Survey

6.3.5 PROCESS FINDINGS

6.3.5.1 Staff and Implementer Interviews

The following section summarizes the key findings from in-depth interviews with two ENO program staff, one APTIM staff, and one Franklin staff; ENO staff participated in one interview and APTIM and Franklin staff participated in a second interview. These in-depth interviews aimed to learn more about the Retail Lighting and

Appliance program design and operations, and the successes and challenges experienced during PY13. Interviews lasted approximately 60 minutes and were conducted using the Microsoft Teams platform.

6.3.5.1.1 *Program Description*

The Retail Lighting and Appliances (RLA) offering provides Point-of- Purchase discounts for light emitting diodes (LEDs) through participating retailers, as well as mail-in rebates (downstream rebates) for refrigerators, window AC, pool pumps, smart thermostats, and heat pump water heaters.

A complete list of eligible items is listed below:

- Aerator
- Showerhead
- Advanced Power Strip
- Light Emitting Diode (LED) Lamp
- ENERGY STAR Pool Pump
- ENERGY STAR Smart Thermostat
- ENERGY STAR Dehumidifier
- ENERGY STAR Water Cooler
- ENERGY STAR Refrigerator/Freezer
- ENERGY STAR Window Air Conditioner
- ENERGY STAR Heat Pump Water Heater
- ENERGY STAR Air Purifier

6.3.5.1.2 *Program Implementation*

In response to the EISA backstop that went into effect in July 2023, program staff front loaded the lighting component of the Retail Lighting and Appliance Program in PY13. In practice, this frontloading resulted in all kits being sent out in the first half of the year, as well as strong marketing campaigns between January and June. Staff noted that by July, the program was at about 85% of goal and that the remaining goal would come from appliances and online marketplace related rebates.

Moving forward, APTIM and Franklin are brainstorming how to pivot the program to reflect the new code and will likely decrease savings goal to reflect the new environment.

6.3.5.2 Participant Survey Findings

Evaluators conducted a survey to better understand the customer experience with the Retail Lighting and Appliance program. Five hundred and fifty customers of Entergy New Orleans who participated in the Retail Lighting and Appliance program were invited to complete a survey. Thirty participants completed the survey.

6.3.5.2.1 *Awareness and Motivations for Use*

Most respondents were aware of the rebate program before purchasing the qualifying product, while a little over a quarter either learned about it when purchasing or after the purchase was made (Table 6-23). Most respondents learned about the rebate program directly, whether via email or the website (Table 6-24).

TABLE 6-23 ENERGY SMART REBATE PROGRAM AWARENESS (N=30)

Learned about rebate	%
Before I made the purchase(s)	66.7%
About the same time I made the purchase(s)	16.7%
After I made the purchase(s)	10%
I don't know	6.7%

TABLE 6-24 ENERGY SMART REBATE PROGRAM INFLUENCE (N=30)

Source	%
Email from Entergy New Orleans	46.7%
Entergy's website or the Energy Smart Rebate website	40.0%
Friend, family member, or colleague	13.3%
Retailer – brick and mortar location	3.3%
Signage at the store or sticker on appliance	3.3%
Internet search (e.g., Google search)	3.3%
Other	10.0%
I don't know	3.3%

Across products, motivations for participating in the program included saving money on energy bills, conserving energy and/or protecting the environment, getting discounts on equipment/service, and improving the comfort of the home (Table 6-25).

TABLE 6-25 MOTIVATIONS FOR PARTICIPATING IN ENERGY SMART REBATE PROGRAM (N=19)

Reason for Purchase	LED Lamp (n=11)	APS (n=3)	Low-Flow Shower head (n=2)	Faucet Aerator (n=1)	Kitchen Faucet Aerator (n=1)	Pipe Wrap (n=1)
Save money on energy bills	54.5%	--	50.0%	--	100.0%	--
Conserve energy and/or protect the environment	18.2%	100.0%	--	100.0%	--	--
Get the free discounted equipment or service	27.3%	--	--	--	--	--
Improve the comfort of your home	--	--	50.0%	--	--	--
Other	--	--	--	--	--	100.0%

The factors most affecting model selection are operational costs, environmental impact, and the product having an ENERGY STAR label. Other motivations for model selection include the product's price fit within the budget and the availability of a rebate. Brand preference and contractor/retailer recommendations are less of a contributor (Table 6-26).

TABLE 6-26 MOTIVATIONS FOR SELECTING PRODUCT MODEL (N=19)

Reason for Model Selection	LED Lamp (n=11)	APS (n=3)	Low-Flow Shower head (n=2)	Faucet Aerator (n=1)	Kitchen Faucet Aerator (n=1)	Pipe Wrap (n=1)
It costs less to operate it	36.4%	--	100.0%	100.0%	100.0%	--
It's good for the environment	18.2%	--	100.0%	100.0%	100.0%	--
It had an ENERGY STAR label	18.2%	--	100.0%	100.0%	100.0%	--
There was a rebate for it	36.4%	33.3%	50.0%	--	--	--

It was a good price of fit within my budget	54.5%	33.3%	50.0%	--	--	--
It was all that was available/ only choice	9.1%	33.3%	--	--	--	100.0%
It had features I wanted	9.1%	33.3%	--	--	--	--
It was the right size/color	27.3%	--	--	--	--	--

Nearly all respondents have installed the product they received through the program. One participant purchased two APS and has only installed one of them. One participant reported that they have not yet installed LED lamps because they have not needed them, but that they plan to do so in the next 6 months.

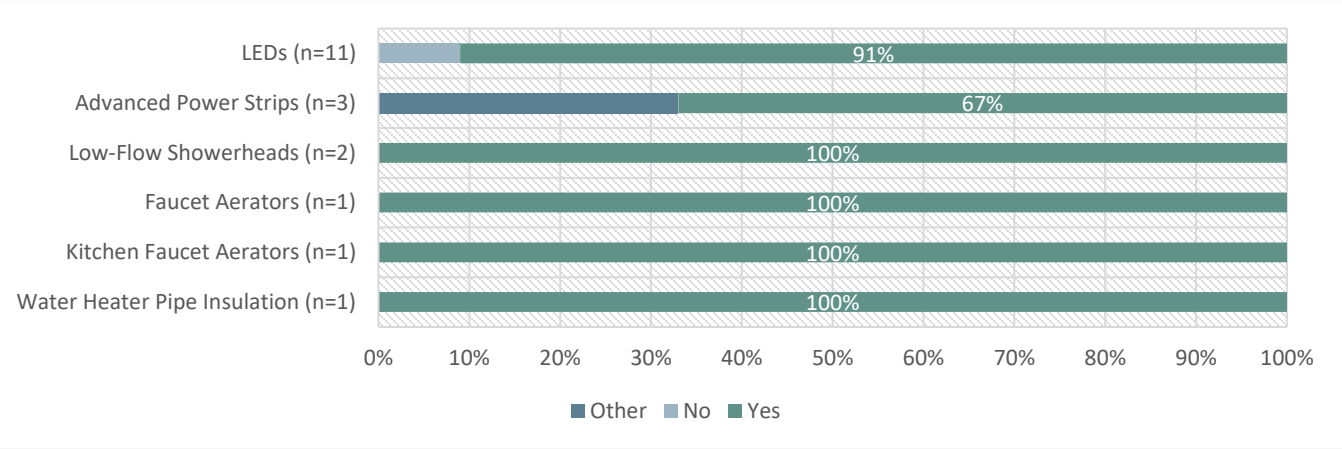


FIGURE 6-3 PRODUCT INSTALLATION STATUS (N=19)

6.3.5.2.2 *ENERGY STAR Wi-Fi Thermostat*

More than half of those who purchased a smart thermostat did so to save money on energy bills (56.3%, n=9). Other reasons for purchasing a smart thermostat through the program include conserving energy/protecting the environment and getting discounts on service/equipment (Table 6-27).

TABLE 6-27 MOTIVATIONS FOR PURCHASING SMART THERMOSTAT (N=16)

Reason for Purchase	%
Save money on energy bills	56.3%
Conserve energy and/or protect the environment	12.5%
Get the free discounted equipment or service	12.5%
Other	12.5%
I don't know	6.3%

Nearly forty percent of respondents chose a specific smart thermostat model because the price fit within their budget (37.5%, n=6). A quarter of respondents chose a particular model because it had desired features (25.0%, n=4), while others were looking for a specific brand (18.8%, n=3) (Table 6-28).

TABLE 6-28 MOTIVATIONS FOR SELECTING SMART THERMOSTAT MODEL (N=16)

Reason for Model Selection	%
It was a good price of fit within my budget	37.5%
It had features I wanted	25.0%
Wanted a specific brand	18.8%
There was a rebate for it	12.5%
It costs less to operate it	12.5%
It had an ENERGY STAR label	12.5%
It's good for the environment	6.3%
It was all that was available/only choice	6.3%
The contractor/retailer recommended it	6.3%
Other	6.3%
I don't know	6.3%

Most respondents have already installed the Smart Thermostat they received through the program (81.0%, n=13). Of the three respondents who have not yet installed their Smart Thermostat, two plan to do so in the next six months.

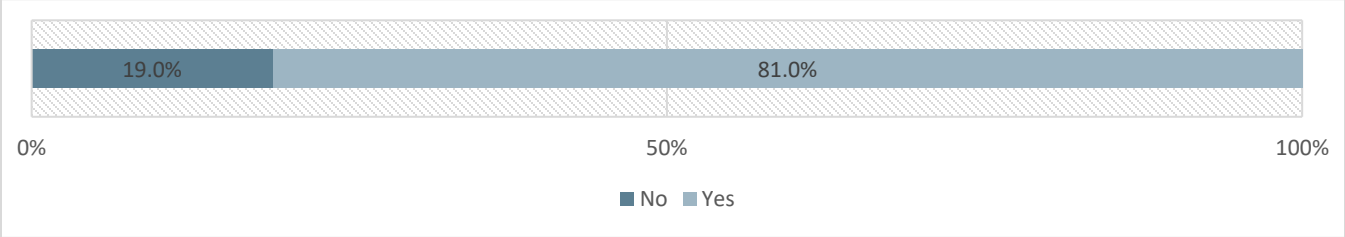


FIGURE 6-4 SMART THERMOSTAT INSTALLATION (N=16)

Respondents cite various reasons for not installing their smart thermostat yet, including lack of time to do so, trouble with the installation, and having installed one but not the other.

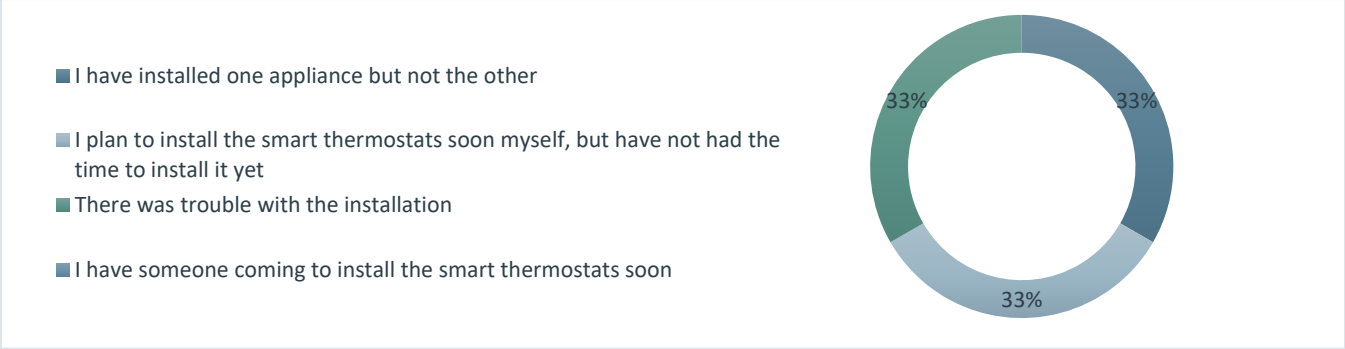


FIGURE 6-5 REASONS FOR NON-INSTALLATION (N=3)

The majority of respondents installed a new smart thermostat to replace an existing standard one.

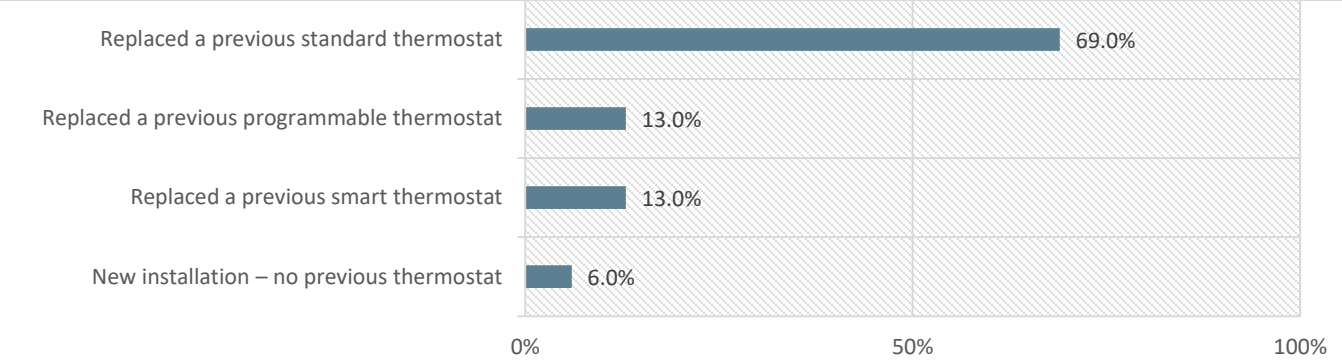


FIGURE 6-6 NEW OR REPLACED THERMOSTAT (N=16)

Nearly all respondents had an existing thermostat that was fully working and not in need of repair before installing a smart thermostat (94.0%, n=15). The average age of existing thermostats was just under 12 years. Almost two thirds of respondents had out-of-pocket costs associated with purchasing a new thermostat for an average cost of $48. Respondents were equally likely to answer 'Yes' and 'No' when asked if they had plans to purchase an ENERGY STAR smart thermostat prior to learning about the rebate.

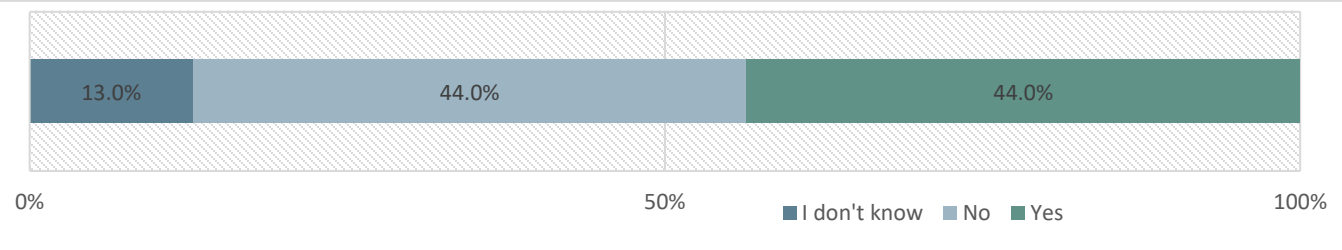


FIGURE 6-7 PRE-REBATE PLANS TO PURCHAS E SMART THERMOSTAT (N=16)

Of those with prior plans to purchase an ENERGY STAR Wi-Fi thermostat, most would have been able to do so if the rebate was not available (71.0%, n=5).

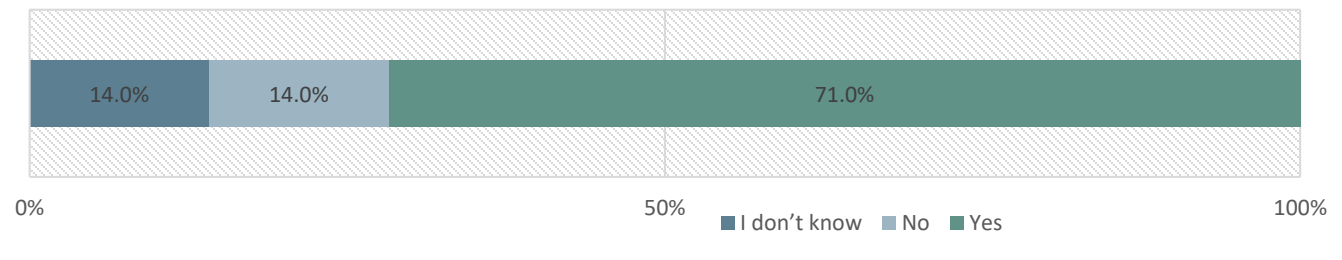


FIGURE 6-8 ABILITY TO PURCHASE SMART THERMOSTAT WITHOUT REBATE (N=7)

If the rebate for an ENERGY STAR smart thermostat had not been available, most respondents would have purchased a programmable thermostat or different Wi-Fi thermostat.

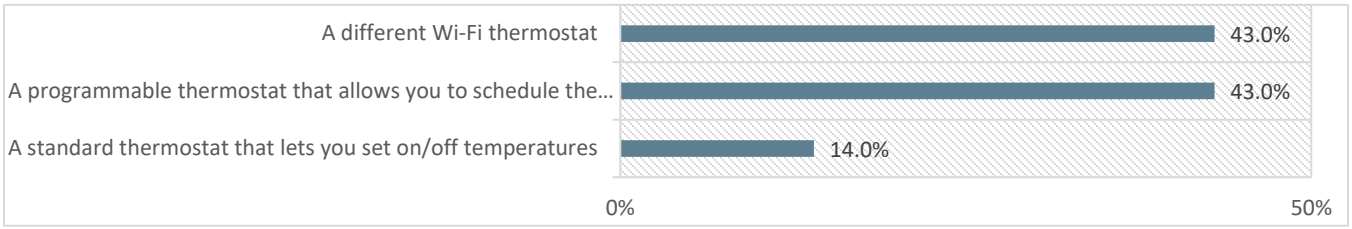


FIGURE 6-9 ALTERNATE THERMOSTAT TYPE (N=7)

Of those who could purchase the thermostat without a rebate, most would be likely or very likely to do so.

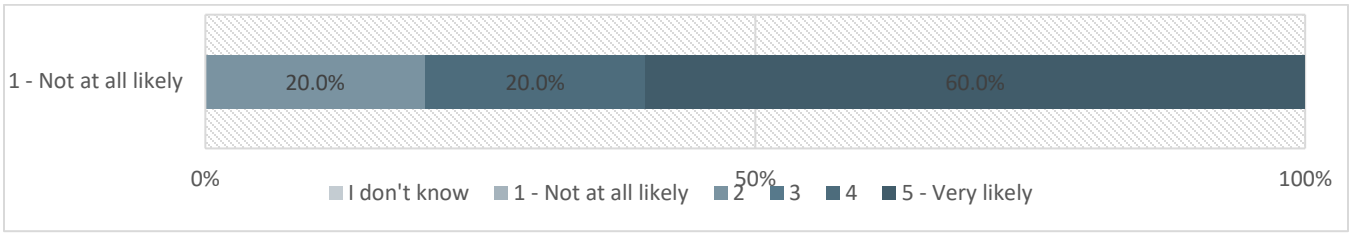


FIGURE 6-10 LIKELIHOOD OF PURCHASING ENERGY STAR WI-FI THERMOSTAT WITHOUT REBATE (N=5)

Among those who planned to purchase the thermostat regardless of the rebate program, 40.0% say that the availability of a rebate accelerated their purchase timeline.

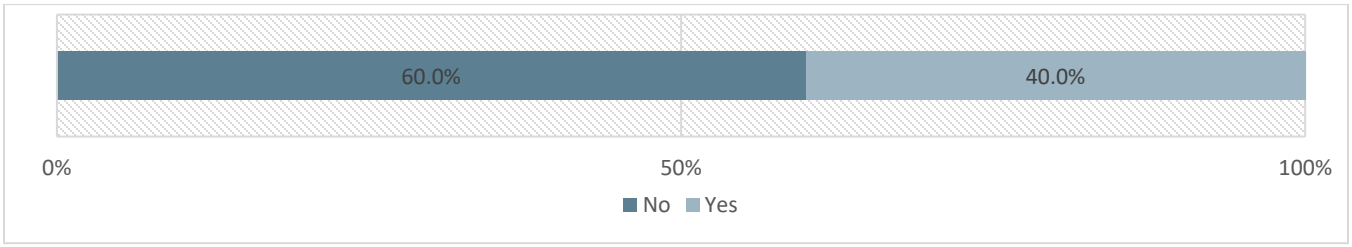


FIGURE 6-11 REBATE'S IMPACT ON PURCHASE TIMELINE (N=5)

Without a rebate, those who purchased their thermostat sooner than they planned, would have waited 6 months to over a year to purchase the ENERGY STAR smart thermostat if there wasn't a rebate.

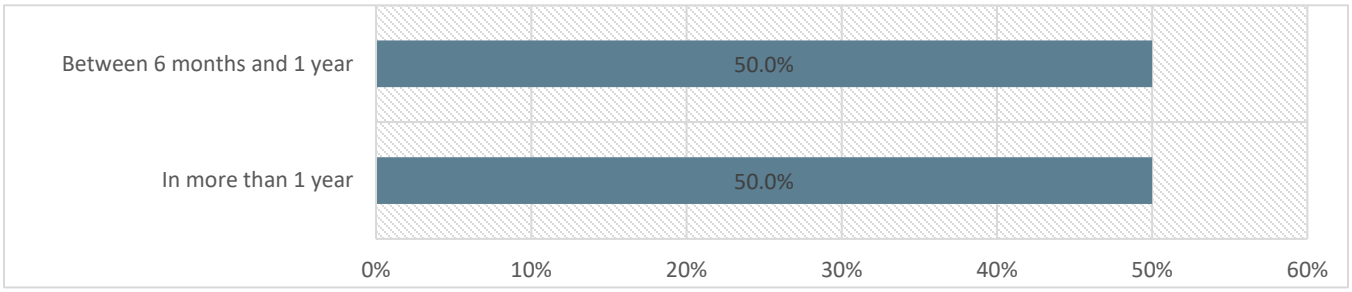


FIGURE 6-12 ALTERNATIVE PURCHASE TIMELINE (N=2)

6.3.5.2.3 *ENERGY STAR Refrigerator*

Respondents who purchased an ENERGY STAR refrigerator were motivated to save money on energy bills and improve the value of their residence (Figure 6-13).

FIGURE 6-13 MOTIVATIONS FOR PURCHASING ENERGY STAR REFRIGERATOR (N=3)

Reason for Purchase	%
Save money on energy bills	66.7%
Improve the value of the residence	33.3%

All respondents were motivated to purchase a refrigerator with an ENERGY STAR label.

Two-thirds of respondents chose the refrigerator they did because the model's price fit within their budget (Figure 6-14).

FIGURE 6-14: MOTIVATIONS FOR SELECTING FRIDGE MODEL (N=3)

Reason for Model Selection	%
It had an ENERGY STAR label	100.0%
It was a good price of fit within my budget	66.7%
There was a rebate for it	33.3%
It's good for the environment	33.3%
Wanted the brand	33.3%
It was the right size/color	33.3%
It costs less to operate it	33.3%

All respondents who purchased an ENERGY STAR refrigerator through the rebate program have already installed it. Two thirds of respondents who purchased a refrigerator say they would have been able to do so without the available rebate. Respondents were split on whether they planned to purchase an ENERGY STAR refrigerator prior to learning about the rebate. The participant who did have prior plans to purchase an ENERGY STAR refrigerator would have been neither likely nor unlikely to do so without a rebate. The rebate's availability did not accelerate the purchase timeline for the participant who previously planned to purchase an ENERGY STAR refrigerator.

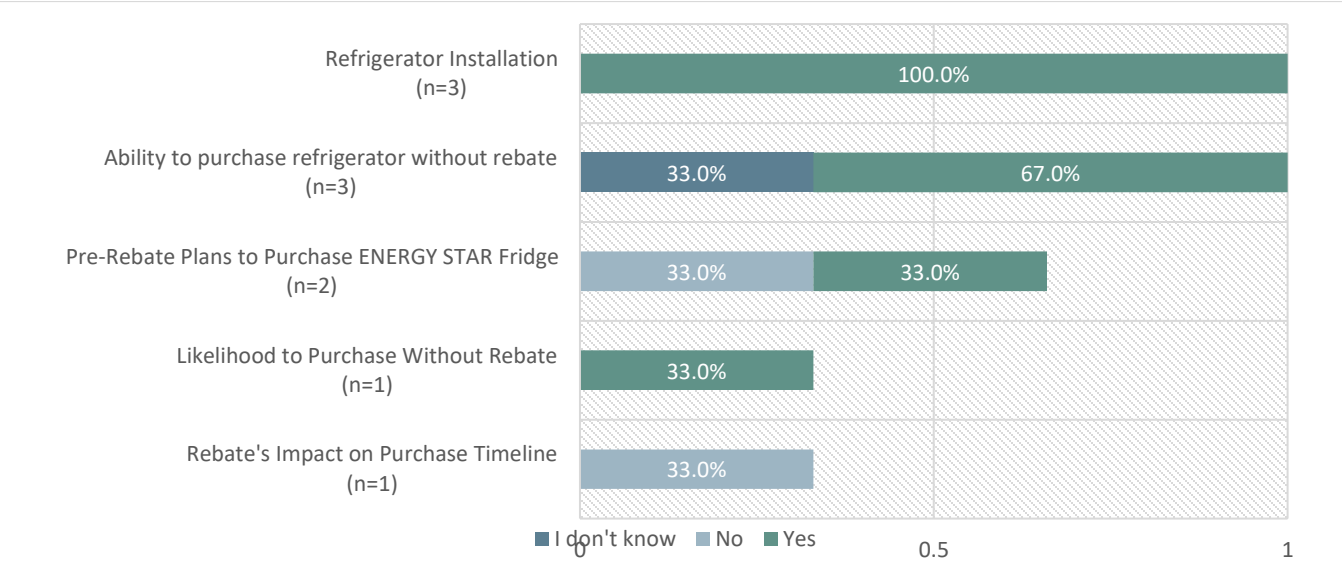


FIGURE 6-15 REBATE IMPACT ON ENERGY STAR REFRIGERATOR PURCHASE (N=3)

6.3.5.2.4 *Spillover*

Since participating in the program, two-thirds of respondents have made purchases or upgrades that will help their home be more energy efficient.

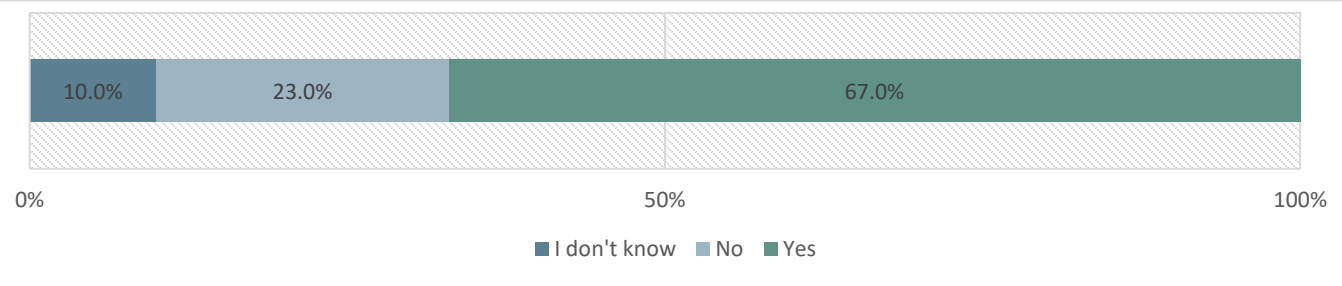


FIGURE 6-16 PROGRAM'S IMPACT ON ENERGY EFFICIENCY (N=30)

Of those who have recently purchased or upgraded energy efficient equipment, most have done so without receiving an incentive or discount.

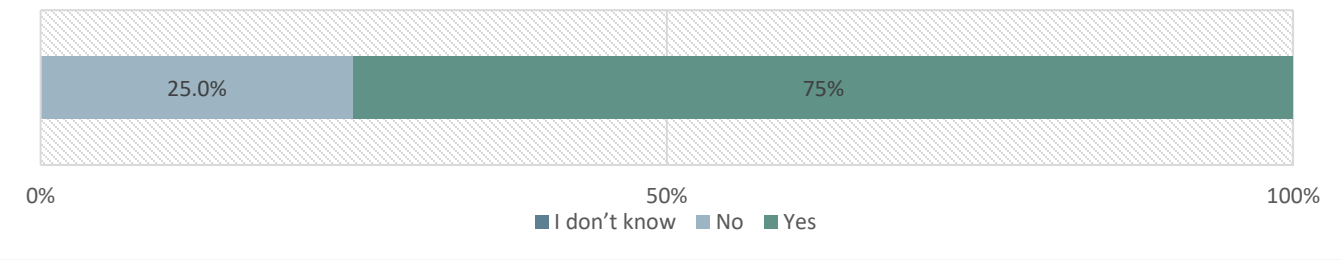


FIGURE 6-17 INCENTIVES TO MAKE ENERGY EFFICIENT UPGRADES (N=20)

Of those who were not incentivized to make purchases or upgrades to help reduce energy usage, more than half purchased LED lamps. Other purchases include air purifiers and dehumidifiers, smart thermostats, advanced power strips, and low-flow showerheads (Figure 6-18).

FIGURE 6-18 ENERGY EFFICIENT PURCHASES AND UPGRADES (N=15)

Purchases/Upgrades	n
LED light bulbs	8
Air purifier	4
ENERGY STAR dehumidifier	3
ENERGY STAR smart thermostat	3
Advanced power strips	3
Low flow showerhead	3
Pipe insulation	2
Faucet aerators	2
ENERGY STAR freezer	1
None of the above	4

Four respondents purchased energy-efficient air purifiers, half installed only one, while other respondents installed two or three in their home. Respondents who purchased water heater pipe insulation (n=2) installed no more than 8-feet. Two respondents purchased low flow faucet aerators (n=2). Of the three respondents who

purchased low flow showerheads, two installed just one showerhead, while another installed three. All respondents who purchased a Smart Thermostat (n=3) use it to control both heating and cooling systems. Among those who have made recent purchases or upgrades to reduce energy usage, most use a central forced air furnace or heat pump to heat their home.

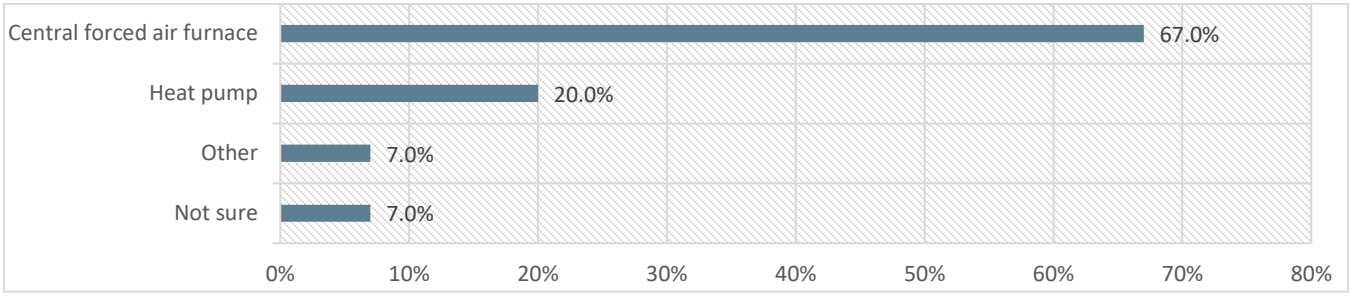


FIGURE 6-19 CENTRAL HEATING SYSTEM IN HOME (N=15)

Forty percent of respondents report that their home heating system uses electricity, while another third report using natural gas to fuel their heating system. Twenty percent of respondents are unsure of what fuel is used by their central heating system. Respondents who purchased an ENERGY STAR dehumidifier installed one in their home.

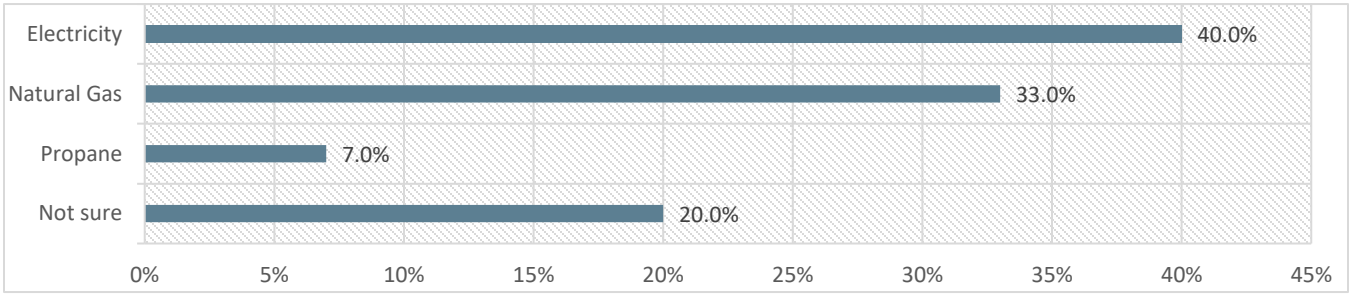


FIGURE 6-20 FUEL USED BY HEATING SYSTEM (N=15)

Sixty percent of respondents report that the program was at least somewhat important to their decision to purchase energy-efficient items.

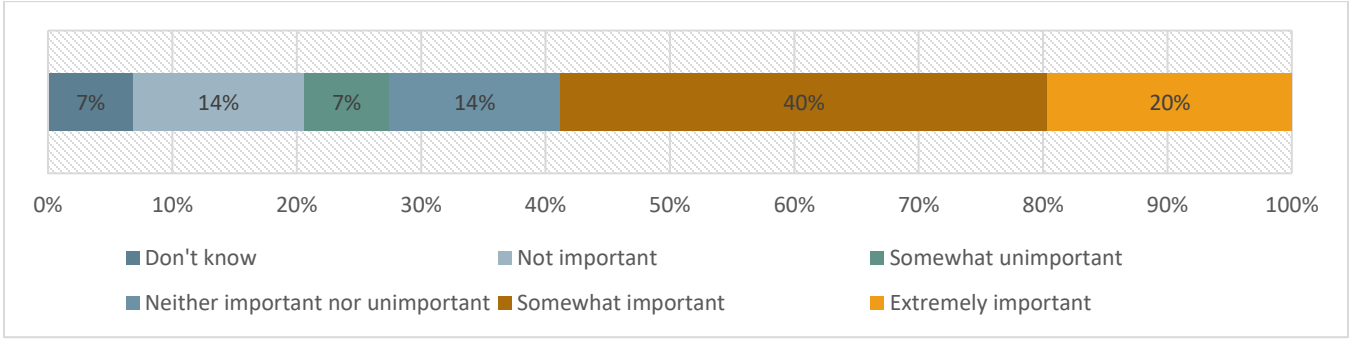


FIGURE 6-21 IMPORTANCE OF PROGRAM TO PURCHASE DECISION (N=15)

Fewer than half of respondents would have been at least somewhat likely to purchase these additional items if they had not participated in the program. A third of respondents indicated that they would have been unlikely to purchase additional items if they had not participated in the program.

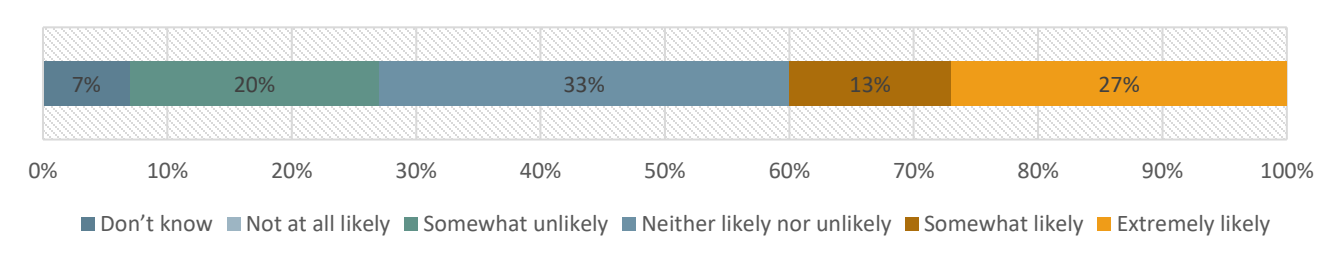


FIGURE 6-22 LIKELIHOOD TO PURCHASE ITEMS WITHOUT PROGRAM PARTICIPATION (N=15)

6.3.5.2.5 *Energy Efficiency Knowledge, Attitudes, and Intentions*

Most respondents report adopting a new energy saving behavior in their home in PY13/2023.

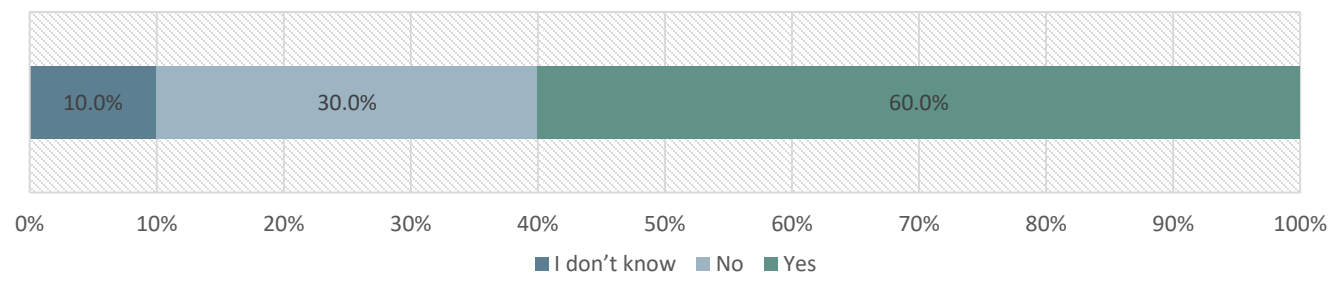


FIGURE 6-23 ADOPTION OF ENERGY SAVING BEHAVIOR (N=30)

Nearly 60% respondents are very interested in receiving additional information on energy saving tips and rebate programs offered.

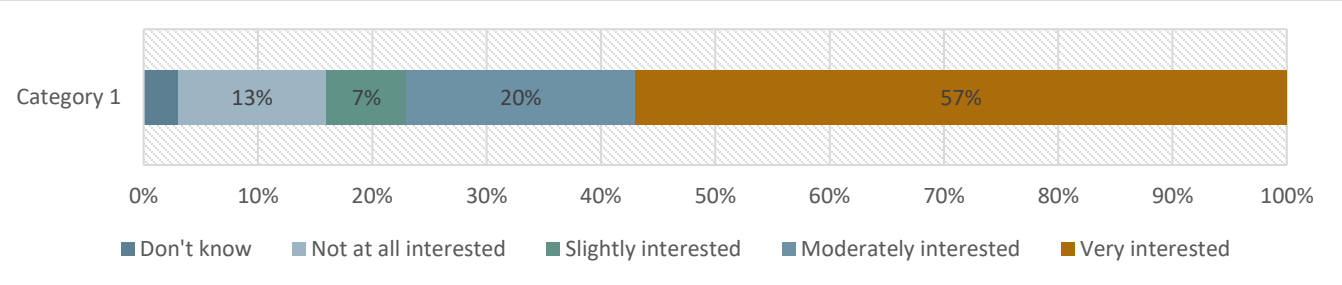


FIGURE 6-24 INTEREST IN RECEIVING ENERGY SAVING TIPS AND PROGRAM OFFERINGS (N=30)

Email is the most preferred contact method to receive information on energy saving equipment and improvements (Figure 6-25).

FIGURE 6-25 PREFERRED CONTACT METHOD (N=30)

Contact Method	%
Email	63.3%
Entergy's Energy Smart website	10.0%
Bill inserts	6.7%
Text messages	6.7%
Entergy's customer engagement portal	3.3%
Newsletter	3.3%
None – prefer not to receive information	6.7%

6.3.5.2.6 *Satisfaction*

Most respondents did not contact Entergy with questions about their rebate application.

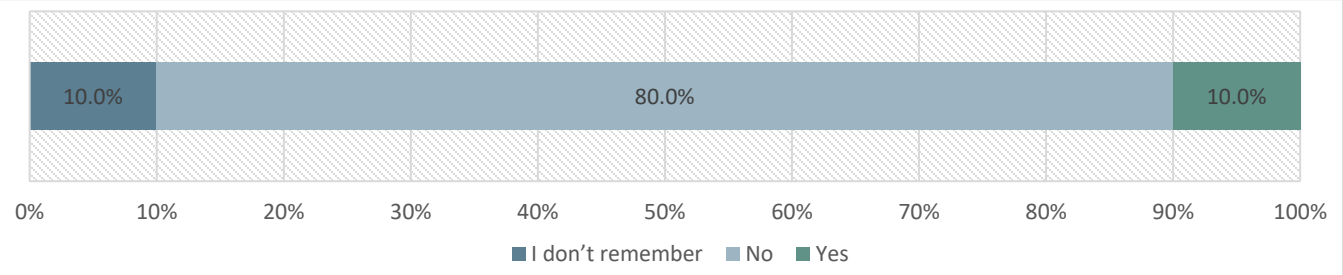


FIGURE 6-26 ENTERGY CONTACT RATE (N=30)

Respondents who contacted Entergy regarding their rebate application did so to find out the status of their rebate and ensure their application was received.

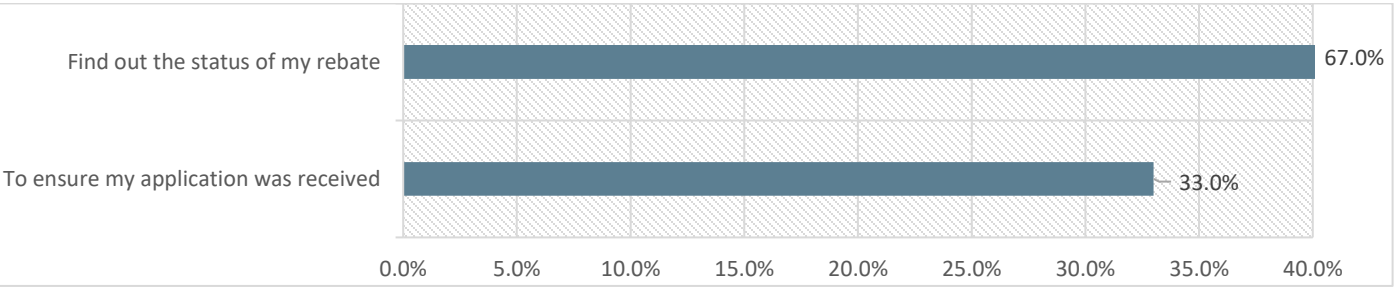


FIGURE 6-27 REASONS FOR CONTACTING ENTERGY (N=3)

Of those who did contact Entergy regarding their rebate application, most were very satisfied with the thoroughness and timeliness of support provided by Entergy staff. The one respondent dissatisfied with the support indicated the staff was "not knowledgeable about the program and were disinterested in assisting me."

Most respondents who have already received their rebate did so within 4 weeks of submitting their application. A significant percentage don't know how long it took to receive the payment after applying.

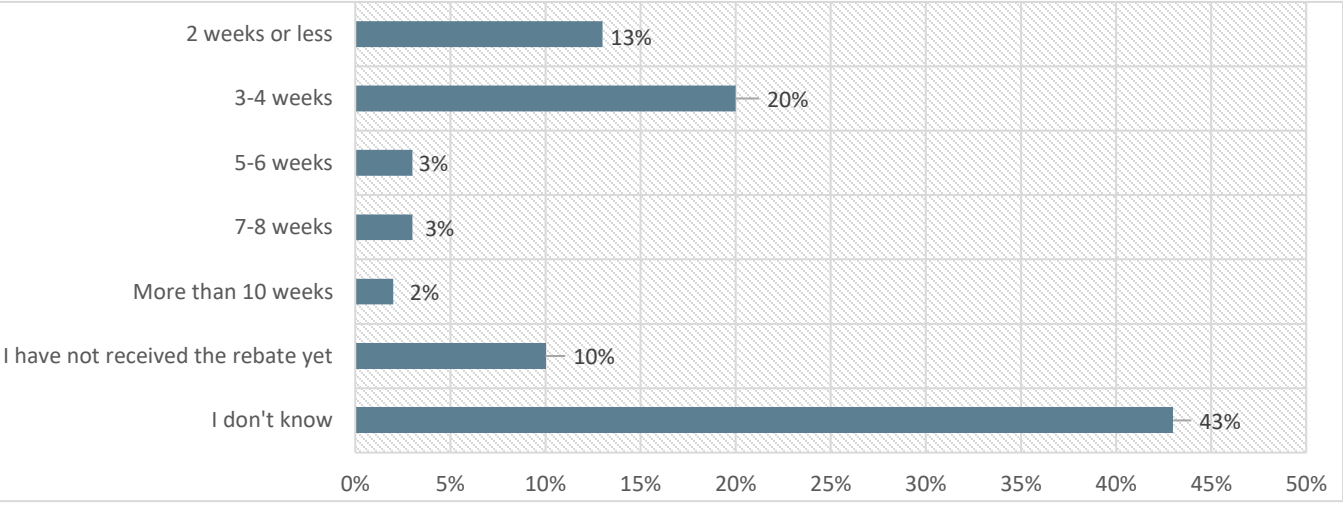


FIGURE 6-28 TIME TO RECEIVE REBATE

More than half of all program respondents are somewhat or very satisfied with Entergy New Orleans as their electricity service provider.

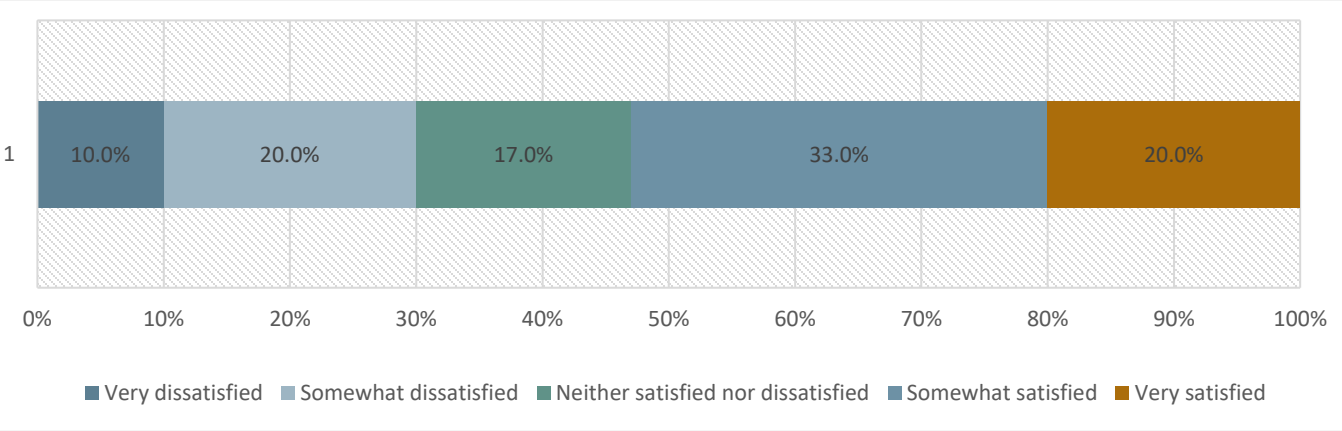


FIGURE 6-29 SATISFACTION WITH ENTERGY (N=30)

More than 80% of program respondents are somewhat or very satisfied with the ENERGY STAR energy efficient products they installed. Respondents are most dissatisfied with the wait time to receive the rebate and the rebate application process. One respondent asked for greater transparency on rate increases.

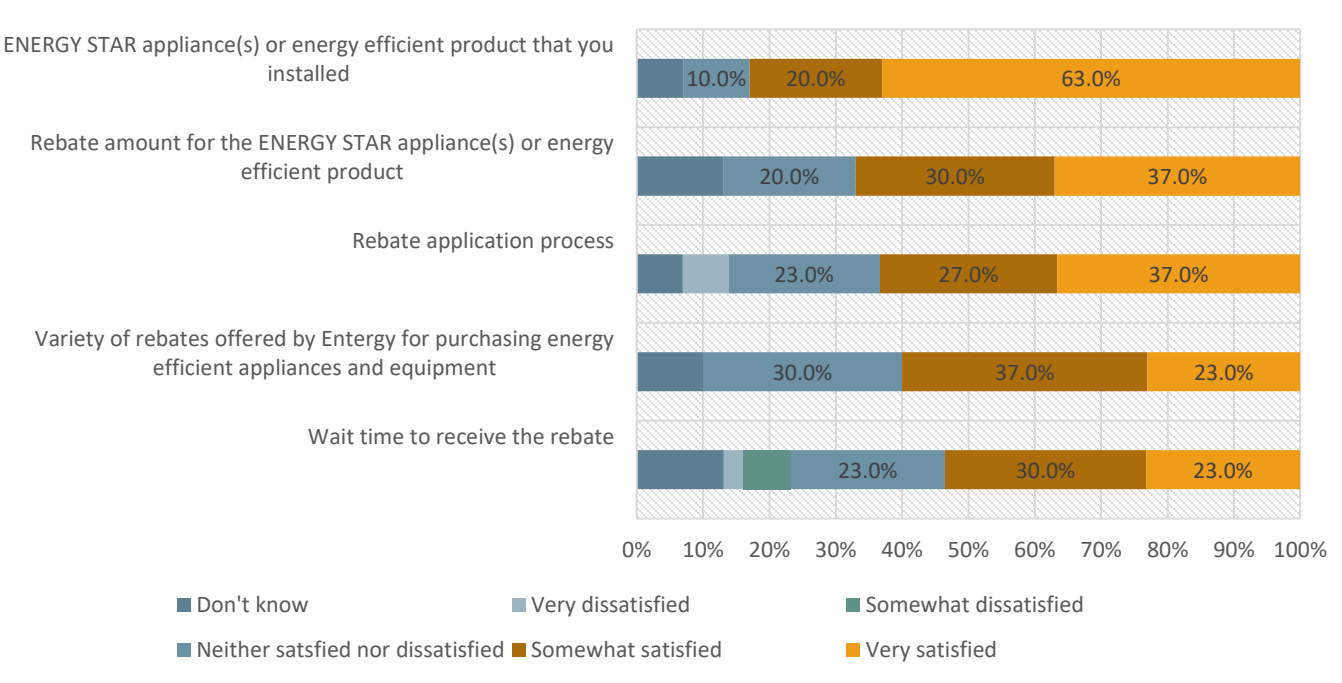


FIGURE 6-30 SATISFACTION WITH ASPECTS OF ENTERGY SERVICE (N=30)

6.4 Data Tracking Review

The Evaluators reviewed the implementer-provided tracking data and noted that the fields that were missing in PY13 data were generally present in PY13. The following bullets outline notes from reviewing the RLA data:

- Purchase / Rebate date: ship / purchase / rebate dates were missing in the PY13 tracking data – the Evaluators were not able to determine when the appliances were purchased / rebated or when the LED lamps were sold by the retailers. Install dates, completion dates, and payment dates were provided, however, they may be different than the ship date for online marketplace projects.
- Appliance participant information: In general, participant contact names, contact phone numbers, and email addresses were provided in PY13=3 data, however, there were many projects that were missing these fields:
    - Participant phone number: 4,949 projects in 1,270 distinct homes (1,270 out of 2,021 homes)
    - Participant email address: 3,349 projects (310 homes out of 2,021)

In PY13, the Evaluators noted that all the projects were provided in one Excel file. This helped in gathering insights into program totals.

6.5 Findings and Conclusions

Findings and Conclusions:

- Awareness of the Program: Most respondents learned about the program directly from the program, primarily through email communication or the program's website. However, satisfaction with the rebate process is lower due to issues with wait times and application procedures.
- Influence of the Program: The program significantly influences customers' energy efficiency behaviors and purchases, with two-thirds of respondents reporting making purchases or upgrades to their homes to reduce energy usage.

Recommendations:

- Online Advertising: Given the effectiveness of online methods such as email and website banners, it is recommended to focus advertising efforts on these channels to maximize program visibility.
- Streamline Rebate Process: Streamlining the rebate application process to improve customer experience is crucial. Additionally, providing enhanced customer service representative training will ensure better program understanding and support for participants.

7 MULTIFAMILY SOLUTIONS

7.1 Summary

The tables below report *ex ante* gross, *ex post* gross, *ex post* net energy savings (kWh) (both annual and lifetime), demand reductions (kW), participation, and incentive spend, by measure, where applicable.

TABLE 7-1 PY13 MULTIFAMILY SOLUTIONS ENERGY SAVINGS (KWH)

Measure	Ex Ante Gross Savings (kWh)	Realization Rate (kWh)	Ex Post Gross Savings (kWh)	NTG	Ex Post Net Savings (kWh)
Advanced Power Strip (Tier 2)	151,030	66.3%	100,062	82.0%	82,057
Air Infiltration	827,274	82.6%	683,190	85.3%	583,030
Attic Insulation	57,963	74.7%	43,295	80.5%	34,856
Bathroom Aerator	102,475	87.6%	89,773	100.0%	89,773
Duct Sealing	1,421,014	95.2%	1,352,552	85.3%	1,154,258
Kitchen Aerator	42,746	87.6%	37,451	100.0%	37,451
LED Lamp 11W (A Type)	67	77.2%	52	76.0%	39
LED Lamp 15W (A Type)	135	78.1%	106	76.0%	80
LED Lamp 15W (Outdoor/PAR38)	6,633	80.8%	5,358	76.0%	4,073
LED Lamp 5W (Candelabra)	47,348	84.0%	9,794	76.0%	30,246
LED Lamp 6W (Globe)	69,648	83.0%	57,829	76.0%	43,953
LED Lamp 8W (Flood)	6,959	85.0%	5,914	76.0%	4,495
LED Lamp 9W (A Type)	119,444	80.6%	96,281	76.0%	73,179
Low-Flow Showerhead	452,808	84.1%	380,995	83.0%	316,260
MF DI Incentive Bonus	0	100.0%	0	N/A	0
Pipe Wrap	74,526	95.7%	71,346	83.0%	59,224
Smart Thermostat	9,261	82.7%	7,659	83.0%	6,357
Total	**3,389,330**	**87.7%**	**2,971,658**	**84.8%**	**2,519,333**

Sums may differ due to rounding.

TABLE 7-2 PY13 MULTIFAMILY SOLUTIONS DEMAND REDUCTIONS (KW)

Measure	Ex Ante Gross Reductions (kW)	Realization Rate (kW)	Ex Post Gross Reductions (kW)	NTG	Ex Post Net Reductions (kW)
Advanced Power Strip (Tier 2)	15.55	66.3%	10.30	82.0%	8.45
Air Infiltration	269.80	82.6%	222.81	85.3%	190.14
Attic Insulation	73.69	74.7%	55.04	80.5%	44.31
Bathroom Aerator	10.55	88.5%	9.34	100.0%	9.34
Duct Sealing	401.11	94.8%	380.44	85.3%	324.66
Kitchen Aerator	4.47	87.2%	3.89	100.0%	3.89
LED Lamp 11W (A Type)	0.01	89.6%	0.01	76.0%	0.01
LED Lamp 15W (A Type)	0.02	91.2%	0.02	76.0%	0.02
LED Lamp 15W (Outdoor/PAR38)	0.00	100.0%	0.00	76.0%	0.00
LED Lamp 5W (Candelabra)	8.88	88.9%	7.90	76.0%	6.01
LED Lamp 6W (Globe)	12.72	90.2%	11.48	76.0%	8.73
LED Lamp 8W (Flood)	1.24	94.3%	1.17	76.0%	0.89
LED Lamp 9W (A Type)	20.89	91.5%	19.11	76.0%	14.53
Low-Flow Showerhead	47.07	84.2%	39.62	83.0%	32.89
MF DI Incentive Bonus	0.00	100.0%	0.00	N/A	0.00
Pipe Wrap	8.53	95.8%	8.17	83.0%	6.78
Smart Thermostat	0.00	N/A	0.00	83.0%	0.00
Total	**874.54**	**88.0%**	**769.32**	**84.8%**	**650.65**

Sums may differ due to rounding.

TABLE 7-3 PY13 MULTIFAMILY SOLUTIONS LIFETIME SAVINGS SUMMARY

Measure	EUL	Ex Post Gross Lifetime Energy Savings (kWh)	Ex Post Net Lifetime Energy Savings (kWh)
Advanced Power Strip (Tier 2)	10	1,000,621	820,569
Air Infiltration	11	7,515,092	6,413,326
Attic Insulation	20	865,897	697,124
Bathroom Aerator	10	897,731	897,731
Duct Sealing	18	24,345,936	20,776,649
Kitchen Aerator	10	374,511	374,511
LED Lamp 11W (A Type)	3	130	99
LED Lamp 15W (A Type)	3	264	201
LED Lamp 15W (Outdoor/PAR38)	3	13,396	10,182
LED Lamp 5W (Candelabra)	3	99,486	75,615
LED Lamp 6W (Globe)	2	144,571	109,883
LED Lamp 8W (Flood)	3	14,785	11,238
LED Lamp 9W (A Type)	3	240,703	182,949
Low-Flow Showerhead	10	3,809,954	3,162,603
MF DI Incentive Bonus	1	0	0
Pipe Wrap	13	927,501	769,909
Smart Thermostat	11	84,245	69,931
Total	**14**	**40,334,824**	**34,372,520**

Sums may differ due to rounding.

TABLE 7-4 PY13 MULTIFAMILY SOLUTIONS PARTICIPATION AND INCENTIVE SUMMARY

Measure	Participation (Count of Measures)	Incentive Spend ($)
Advanced Power Strip (Tier 2)	462	$24,700
Air Infiltration	825	$243,794
Attic Insulation	31	$34,637
Bathroom Aerator	1,588	$13,764
Duct Sealing	818	$244,508
Kitchen Aerator	1,595	$11,165
LED Lamp 11W (A Type)	1	$16
LED Lamp 15W (A Type)	2	$39
LED Lamp 15W (Outdoor/PAR38)	15	$377
LED Lamp 5W (Candelabra)	465	$12,887
LED Lamp 6W (Globe)	628	$19,278
LED Lamp 8W (Flood)	49	$456
LED Lamp 9W (A Type)	1,101	$27,504
Low-Flow Showerhead	1,536	$29,790
MF DI Incentive Bonus	1,726	$43,590
Pipe Wrap	941	$5,884
Smart Thermostat	25	$4,725
Total	**11,808**	**$717,113**

Sums may differ due to rounding.

7.2 Program Description

The offering is designed to promote energy efficiency in the multifamily (MF) sector by offering home energy walkthrough assessments and deeper energy assessments to multifamily customers. Franklin implements the Multifamily Solutions (MF Solutions) offering. Incentives are provided to trade allies for installation of pre-approved measures. The program is a direct install and weatherization program similar to HPwES, but targets homes with five or more attached dwelling units. Properties with four or more meters can qualify.

This channel was developed to work towards overcoming the “split incentive” barrier to program participation; dwelling units have historically been underserved as owners are often unwilling to make significant investments in energy efficiency when the utility bill is paid by tenants. Participation in the multi-family program is free to all, regardless of income.

7.2.1 PROGRAM DELIVERY CHANNELS AND EXPECTED SAVINGS

The evaluation approach for PY13 included the following activities: project data review, desk reviews, staff interviews, multifamily property manager interviews and site visits. Records indicated a total of 11,808 projects that were completed in twelve (12) large apartment complexes, within 2,572 distinct apartment units.

The following figures shows the contribution to savings by measure in the program.

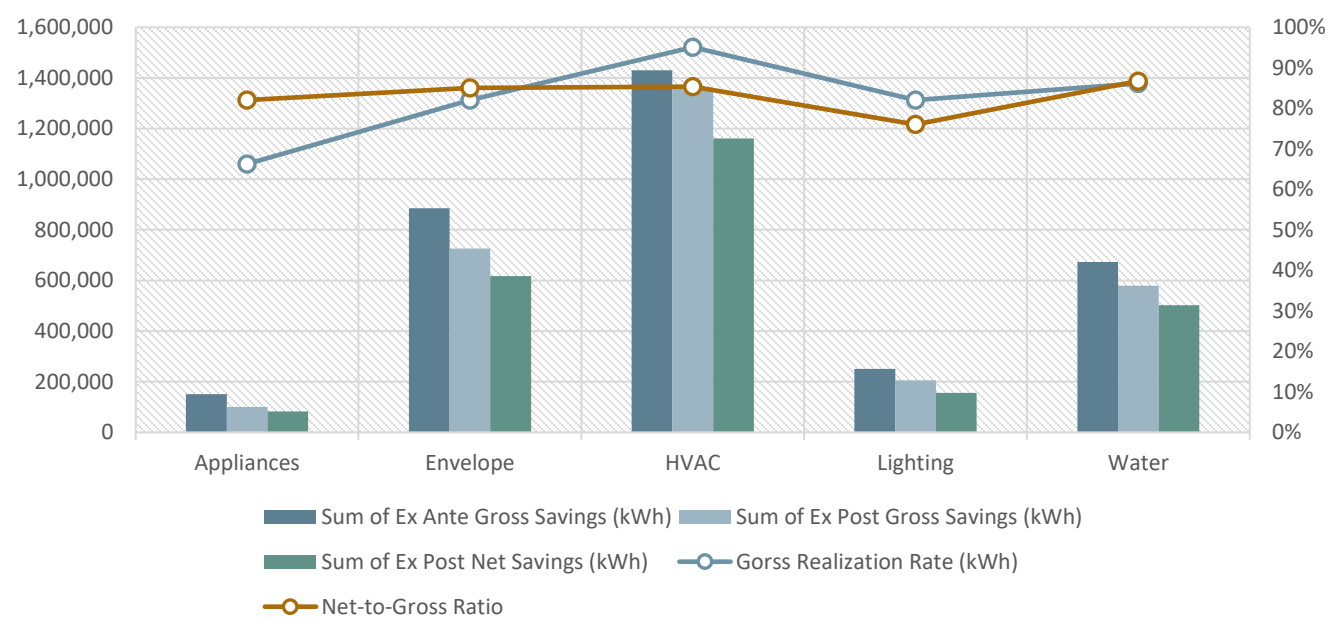
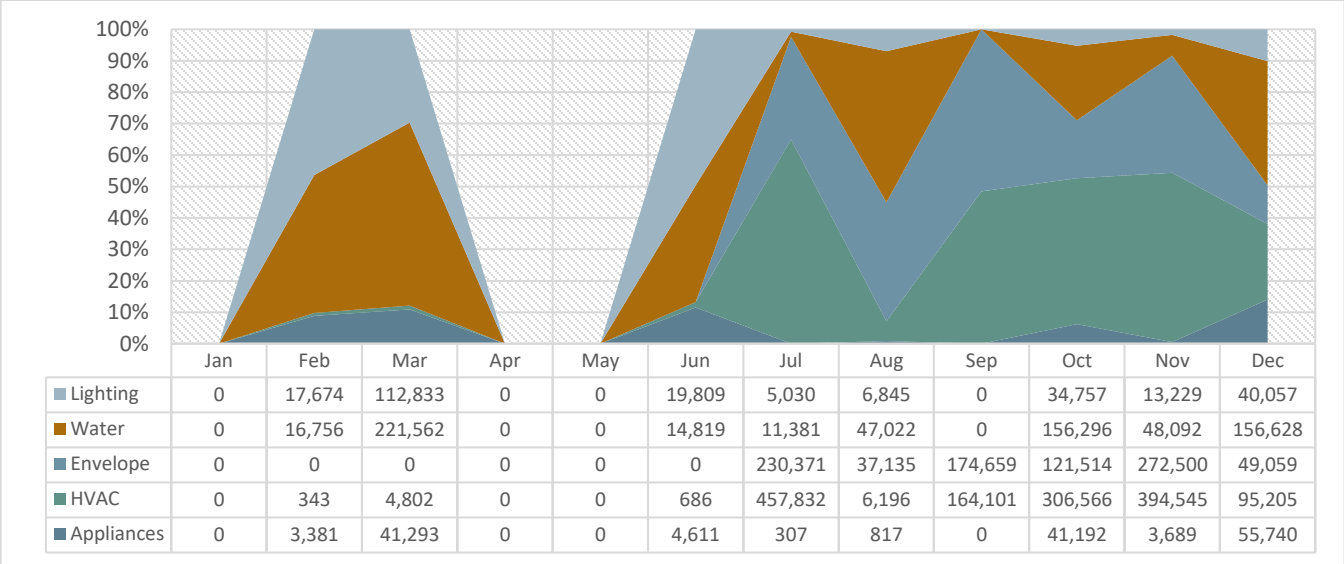


FIGURE 7-1 MULTIFAMILY SOLUTIONS ENERGY SAVINGS SUMMARY (KWH)

In PY13, the HVAC measures (smart thermostats and duct sealing) accounted for 42.2% of expected energy (kWh) savings, the envelope measures (air infiltration, ceiling insulation) contributed 26.1% of expected savings, the water measures (aerators, showerheads) contributed 19.8%, the lighting measures (LED lamps) contributed 7.4%, and the appliance measures (advanced power strips) contributed 4.5% of expected energy savings. Compared to PY13, PY13 saw a 29.3% increase in expected energy savings as the program claimed 2,522,560 kWh in PY13.

7.2.2 TIMING OF PROJECTS

The figure below shows *ex ante* energy savings (kWh) for the program by end use, by month. The tracking data indicated that there was a lull in project completion for the months of April and May.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Lighting	0	17,674	112,833	0	0	19,809	5,030	6,845	0	34,757	13,229	40,057
Water	0	16,756	221,562	0	0	14,819	11,381	47,022	0	156,296	48,092	156,628
Envelope	0	0	0	0	0	0	230,371	37,135	174,659	121,514	272,500	49,059
HVAC	0	343	4,802	0	0	686	457,832	6,196	164,101	306,566	394,545	95,205
Appliances	0	3,381	41,293	0	0	4,611	307	817	0	41,192	3,689	55,740

FIGURE 7-2 *EX ANTE* SAVINGS BY END USE BY MONTH

7.2.3 TRADE ALLIES

The program had six participating trade allies in PY13. Five of the reported trade allies perform weatherization work, including the following measures: duct sealing and air infiltration.

The TPI, Franklin, installs all other measures, including the following: advanced power strip, aerator, LED lamp, water heater pipe wrap, showerhead, and smart thermostat. Franklin also received an incentive for performing the assessment.

The table below shows the distribution of savings across all trade allies.

TABLE 7-5 MULTIFAMILY SOLUTIONS TRADE ALLY ACTIVITY

Trade Ally	Gross Energy Savings (kWh)	% of Savings
Franklin Energy	1,083,079	32%
TA 2	793,524	23%
TA 3	654,153	19%
TA 4	476,423	14%
TA 5	339,508	10%
TA 6	42,644	1%

Sums may differ due to rounding.

7.2.4 GOAL ACHIEVEMENT

Total verified savings and percentage of goals for the program are summarized in the table below.

TABLE 7-6 PY13 MULTIFAMILY SUMMARY OF GOAL ACHIEVEMENT

Ex Post Gross Energy Savings (kWh) Goal	% to kWh Goal	Ex Post Gross Savings (kW) Target	% to kW Target
2,678,475	111%	NA	NA

7.3 EM&V Methodology

The evaluations provided free-ridership estimates, discussions of program satisfaction and strategic recommendations for program improvement, and most/all measures offered by the program have deemed TRM savings. There were staff interviews, a full review of project data, a census of desk reviews, property manager interviews and site visits to confirm installations.

TABLE 7-7-ENERGY SMART FOR MULTIFAMILY DATA COLLECTION ACTIVITIES

Evaluation Activity	Sample Size	Impact	Process
Staff & TPI Interviews	4		X
Database Reviews	Census	X	X
Desk Reviews	Census	X	
Property Manger Interviews	3	X	X
Site Visits	Complexes	X	

7.3.1 SITE VISITS

The Evaluators performed three site visits on projects in the program. The table below outlines the measures captured in the site visits.

TABLE 7-8 SITE VISIT SUMMARY

Measure	PY13 Participant Count	Identified in Site Visits
Advanced Power Strip (Tier 2)	492	NA
Air Infiltration	825	NA
Attic Insulation	31	NA
Faucet Aerator	3,183	27
Duct Sealing	818	NA
LED Lamp	2,261	149
Low-Flow Showerhead	1,536	12
Pipe Wrap	941	NA
Smart Thermostat	25	NA

The largest barrier to scaling was effective multifamily property manager contact information, for both site visits and interview responses. An incentive of $50 was offered and multiple attempts were made. Tenant contact information was not available.

7.3.2 DEEMED SAVINGS CALCULATIONS

Impact methodologies for MF Solutions are the same as described for HPwES, described in Section 4.3.2.

7.4 Evaluation Findings

Evaluation results for the program can be found in Section 7.1 Summary.

7.4.1 GROSS IMPACT FINDINGS

7.4.1.1 Faucet Aerator (Bathroom & Kitchen)

Expected and verified savings for aerators are summarized below. There were 2,294 1.0 GPM bathroom aerators installed at 1,588 distinct residences, while there were 1,595 1.5 GPM kitchen aerators installed at 1,595 distinct residences. The low realization rate may be attributed to the measure ISR that was applied in PY13.

TABLE 7-9 PY13 MULTIFAMILY EXPECTED AND VERIFIED AERATORS SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
145,221	127,224	87.6%	15.02	13.23	88.1%

7.4.1.2 Air Infiltration

Expected and verified savings for the air infiltration projects are summarized below. There were 825 air infiltration projects. The low realization rate may be attributed to the measure ISR that was applied in PY13.

TABLE 7-10 PY13 MULTIFAMILY EXPECTED AND VERIFIED AIR INFILTRATION SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
827,274	683,190	82.6%	269.80	222.81	82.6%

7.4.1.3 Duct Sealing

Expected and verified savings for the duct sealing projects are summarized below. There were 818 duct sealing projects.

TABLE 7-11 PY13 MULTIFAMILY EXPECTED AND VERIFIED DUCT SEALING SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
U1,421,014	1,352,552	95.2%	401.11	380.44	94.8%

7.4.1.4 LED Lamp

Expected and verified savings for LED lamps are summarized below. There were 9,381 LED lamps installed at 2,261 residences.

TABLE 7-12 PY13 MULTIFAMILY EXPECTED AND VERIFIED LED SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
250,234	205,334	82.1%	43.77	39.70	90.7%

7.4.1.5 Water Heater Pipe Wrap

Expected and verified savings for the pipe wrap projects are summarized below. Pipe wrap was installed in 941 residences.

TABLE 7-13 PY13 MULTIFAMILY EXPECTED AND VERIFIED PIPE WRAP SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
74,526	71,346	95.7%	8.53	8.17	95.8%

7.4.1.6 Low-Flow Showerhead

Expected and verified savings for showerheads are summarized below. The low realization rate may be attributed to the measure ISR that was applied in PY13.

TABLE 7-14 PY13 MULTIFAMILY EXPECTED AND VERIFIED SHOWERHEADS SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
452,808	380,995	84.1%	47.07	39.62	84.2%

7.4.1.7 Smart Thermostat

Expected and verified savings for smart thermostats are summarized below. The low realization rate may be attributed to the measure ISR that was applied in PY13.

TABLE 7-15 PY13 MULTIFAMILY EXPECTED AND VERIFIED SHOWERHEADS SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
9,261	7,659	82.7%	0.00	0.00	N/A

7.4.1.8 Avoided Replacement Cost

The Evaluators have added the benefits of ARC. The table below summarizes the ARC by measure in MF Solutions. Information on methodology can be found in Section 3.4.1.3 Avoided Replacement Costs.

TABLE 7-16 SUMMARY OF ARC FOR MF SOLUTIONS

Measure	*Ex Post* Gross ARCs ($)	*Ex Post* Net ARCs ($)	NPV ARCs ($)
Advanced Power Strip (Tier 2)	$0	$0	$0
Air Infiltration	$0	$0	$0
Attic Insulation	$0	$0	$0
Bathroom Aerator	$0	$0	$0
Duct Sealing	$0	$0	$0
Kitchen Aerator	$0	$0	$0
LED Lamp 11W (A Type)	$1	$0	$0
LED Lamp 15W (A Type)	$1	$1	$1
LED Lamp 15W (Outdoor/PAR38)	$7	$6	$6
LED Lamp 5W (Candelabra)	$463	$352	$352
LED Lamp 6W (Globe)	$693	$527	$527

LED Lamp 8W (Flood)	$42	$32	$32
LED Lamp 9W (A Type)	$1,153	$876	$876
Low-Flow Showerhead	$0	$0	$0
Pipe Wrap	$0	$0	$0
Smart Thermostat	$0	$0	$0
Total	**$2,360**	**$1,794**	**$1,794**

Sums may differ due to rounding.

7.4.1.9 Net Impact Findings

Multifamily property manager interview responses were used to estimate the net energy impacts of the program. No spillover was identified in the survey of program participants.

Individual measure net savings are summarized in Section 7.1 Summary.

7.4.1.10 Process Findings

7.4.2 PROCESS FINDINGS

7.4.2.1 Staff and Implementer Interview

The following section summarizes the key findings from in-depth interviews with two ENO program staff, one APTIM staff, and one Franklin staff; ENO staff participated in one interview and APTIM and Franklin staff participated in a second interview. These in-depth interviews aimed to learn more about HPwES program design and operations, and the successes and challenges experienced during PY13. Interviews lasted approximately 60 minutes and were conducted using the Microsoft Teams platform. The evaluators recorded all interviews with participant permission. The following narrative summarizes these interviews. Much of the findings for the program design and operations for residential programs, including Multi-Family Solutions, are presented in Section 4.4.3.1. The following narrative summarizes findings specific to Multi-Family Solutions.

7.4.2.1.1 *Program Description*

The Multi-Family Solutions program is structured the same as HPwES, but with a focus on multi-family apartment buildings rather than single-family homes or four-unit or smaller buildings.

7.4.2.1.1.1 Program Implementation

Staff focus recruitment efforts in the earlier half of the year, as property managers are harder to engage during the fourth-quarter. Staff focus on a variety of building sizes and types to ensure all eligible customers are served. In general, when a building participates in the program, the building receives an assessment, and all units receive the necessary direct install measure upgrades. Typically the building representative – most often the property manager – can speak to the similarities across the different units in the building and assessments are only completed in varying units rather than every unit in the building. Once trade ally related work is determined, trade ally completes all necessary upgrades in the building before moving on to a new project.

7.4.2.1.1.2 Marketing

Staff rely on a pipeline developed from direct outreach. When choosing eligible buildings, staff balance budget constraints with serving maximum number of clients and needs.

7.4.2.1.2 *Property Manager Survey*

Evaluators conducted a survey with Multifamily Solutions program participants to gather feedback about customers' engagement with and experience of the program. Tracking data indicated 11 customers participated in the program in 2023. Participants were sent an email with a link, inviting them to complete the survey, followed by up to two phone calls. Two respondents completed the survey resulting in a response rate of 18.1%.

7.4.2.1.2.1 Property Characteristics

Table 7-17 presents property characteristics which include a mix of townhomes and apartments for both participating properties.

TABLE 7-17 PROPERTY CHARACTERISTICS (N=2)

Characteristic	n
Housing Type	
Apartment building with 5-10 units	1
Apartment building with more than 10 units	1
Housing Age	
Before 1970's	0
1970's	1
1980's	1
1990's	0
2000-2009	0
2010-2019	0
2020 or newer	0
Don't know	0
Prefer not to answer	0
Space Heating Fuel	
Electricity	2
Natural gas	0
Don't know	0
Prefer not to answer	0
Water Heating Fuel	
Electricity	2
Natural gas	0
Propane	0
Don't know	0
Central Air Conditioning	
Yes	2
No	0

7.4.2.1.2.2 Background and Program Awareness

Both respondents serve as property managers for their respective properties which are owned by a multi-property company. One of the respondents has a budget from which they are allowed to make improvements to the building, while the other respondent must have all improvement projects approved by upper management. Both respondents learned about the program from an Entergy New Orleans program representative. They were interested in participating in the program to reduce their tenants' monthly utility bills.

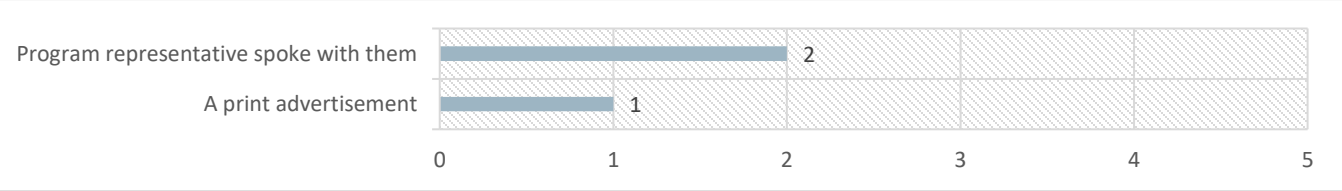


FIGURE 7-3 PROGRAM AWARENESS (N=2)

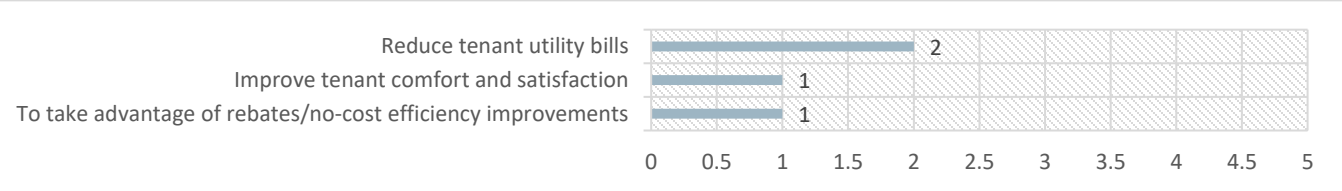


FIGURE 7-4 MOTIVATION FOR PARTICIPATION (N=2)

7.4.2.1.2.3 Participation Experience and Satisfaction

Both respondents remembered receiving a building-wide energy assessment with recommendations for energy efficiency upgrades. One respondent explained that they planned to make similar upgrades to their building in the next two to three years, yet the Energy Smart program expedited their timeline. The other respondent noted that they would not have been financially able to make the energy efficient upgrades if not for the Energy Smart program.

Both respondents were very satisfied with all aspects of their participation experience.

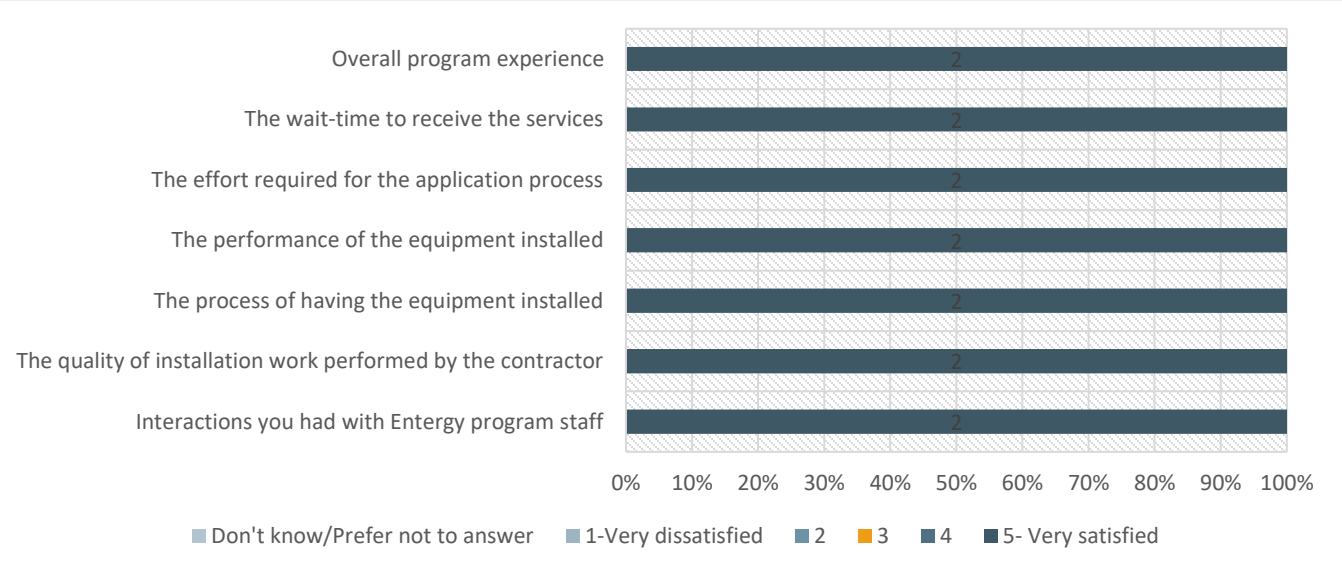


FIGURE 7-5 PROGRAM SATISFACTION (N=2)

7.4.2.1.3 *Near Participant Trade Ally Interviews*

Evaluators conducted interviews about participation in the program with near-participant trade allies to gather feedback about trade ally awareness and general knowledge of energy efficiency actions and programs, as well as barriers to program engagement. “Near-participant” trade allies are trade allies who have previously participated in the program or have expressed interest in program engagement, but not yet enrolled. Tracking

data for the program included 11 unique trade ally contacts in the program. Of these contacts, seven had valid contact information. Trade allies were contacted via phone and email three times and invited to complete an interview. Three near-participants responded to an interview for a response rate of 43%.

7.4.2.1.3.1 Program Strengths

The trade allies interviewed value the program for its straightforward approach and find it effective in repairing common flaws in duct systems and with two of the three allies interviewed calling out significant improvements made in air conditioning performance, often eliminating the need for costly replacements. Two of the three trade allies appreciate the overall simplicity of paperwork processes and the positive impact on multifamily dwellings. All of the trade allies interviewed appreciate the successful new installation projects completed through the program as well as the consistent employment opportunities for their respective companies. All trade allies noted the program's positive evolution, especially in improvements in work assignments and referral processes. One trade ally specifically noted improvements in rebate paperwork submission. These changes are noticed by the three trade allies and considered improvements in overall efficiency of the program.

7.4.2.1.3.2 Program Challenges

Trade allies do express several frustrations with the program, including inefficiencies in customer acquisition, called out as a challenge by all three trade allies. Difficulty in gaining access to properties due to resistance from occupants and reliance on maintenance personnel for entry poses a significant challenge for the allies as well.

> *"Every time we can't get into the door, we have to call this maintenance person. And then sometimes it takes them 30 minutes to 2 hours to show up with a key to get us in. We're just sitting around waiting, going,' this is crazy. We're never going to finish this project at this rate.'" – Installer, Building Envelope*

Delays in job assignments can lead to idle time and frustrations among crews, mentioned by two of the three trade allies. The time gap between sending referrals, assessments being conducted by program managers, and receiving job assignments causes significant delays and uncertainty for the allies. Issues with property management indifference and neglect of necessary repairs are challenging for all three trade allies, leading to missed opportunities for income. Concerns about outdated incentive rates, payment processing delays, and a lack of coordination in job assignments further add to the dissatisfaction among the three trade allies.

> *"The biggest thing I would like to know in terms of their processing of payments, is there a set process or schedule? I don't know. Is it a two-week deal? Is it a month? Is it strictly based on based off of how they process a payment in the order it's received? I have never found consistency with payments, and I wonder if there is a consistency in place or not. I don't know. That's my big issue." – Installer, Building Envelope*

7.4.2.1.3.3 Deeper Trade Ally Engagement

The trade allies interviewed suggest that trade allies would benefit from additional support, such as guidance through the process and clearer communication about customer assignments, as suggested by one trade ally. Another trade ally emphasized the need for a dedicated representative from the program to regularly check in and foster a stronger partnership.

> *"Maybe getting someone to hold my hand through the whole navigator thing and then them being more kind of vocal about them assigning customers to us." – Installer, HVAC & Optimization*

Two of the three allies propose creating educational materials for customers on key services like duct sealing, air sealing, and insulation, as there seems to be a lack of understanding with end customers. A critical recommendation from all three trade allies is to improve the turnaround time between sending in job requests and receiving assignments to increase overall productivity, as delays. The trade allies interviewed also express a desire for more transparency and consistency in the payment processing schedule, seeking clarity on whether there is a set process or schedule for payments.

7.5 Data Tracking Review

The Evaluators reviewed the implementer-provided tracking data and noted that the fields that were missing in PY13 data were generally present in PY13. The following bullets outline notes from reviewing the data:

- Installation dates: the Evaluators noted that installation dates were added in for PY13
- Trade ally information: In general, Trade Ally primary contact names, company names, contact phone numbers, and email addresses were provided in PY13 data, however, there were a handful of projects that were missing these fields:
  - Trade ally primary contact name: 324 projects in 163 distinct homes (163 out of 2,572 homes)
  - Trade ally main phone number: 846 projects (431 homes out of 2,572)
  - Trade ally email address: 846 projects (431 homes out of 2,572)
- Tenant information: Limited effective tenant contact names, contact phone numbers, and email addresses.
- Measure-level parameters: the following is an outline of missing or problematic parameters needed for savings calculations by measure:
  - LED Lamp: heating / cooling types for apartment units were missing for a majority of projects.

7.6 Findings and Recommendations

Findings and Conclusions:

- Effectiveness of Program: Trade allies commend the effectiveness of the program in addressing issues in low-income areas, particularly in improving duct systems and enhancing air conditioning performance.
- Barriers to Engagement: However, property manager indifference and difficulty in gaining access to properties pose significant barriers to program engagement for trade allies.

Recommendations:

- Support for Trade Allies: Providing additional support and guidance for trade allies, including clearer communication about customer assignments and regular check-ins with dedicated program representatives, can enhance program engagement.
- Educational Materials for Customers: Developing educational materials for customers on key services will enhance understanding and engagement with the program. Decreasing turnaround time between job requests and assignments is also recommended to increase overall productivity.

8 A/C SOLUTIONS

8.1 Summary

The tables below report *ex ante* gross, *ex post* gross, *ex post* net energy savings (kWh) (both annual and lifetime), demand reductions (kW), participation, and incentive spend, by measure, where applicable.

TABLE 8-1 PY13 AC SOLUTIONS ENERGY SAVINGS (KWH)

Measure	Ex Ante Gross Savings (kWh)	Realization Rate (kWh)	Ex Post Gross Savings (kWh)	NTG	Ex Post Net Savings (kWh)
Central AC Replacement	1,196	16.3%	195	76.6%	149
Central AC Tune-up	2,035,841	98.5%	2,005,324	88.3%	1,769,989
Duct Sealing	1,332,067	114.7%	1,528,273	90.3%	1,380,144
Ductless Heat Pump	1,343	150.0%	2,015	102.1%	2,058
Smart Thermostat	2,744	99.0%	2,718	102.1%	2,776
Total	**3,373,191**	**104.9%**	**3,538,524**	**89.2%**	**3,155,116**

Sums may differ due to rounding.

TABLE 8-2 PY13 AC SOLUTIONS DEMAND REDUCTIONS (KW)

Measure	Ex Ante Gross Reductions (kW)	Realization Rate (kW)	Ex Post Gross Reductions (kW)	NTG	Ex Post Net Reductions (kW)
Central AC Replacement	0.13	-129.3%	-0.17	76.6%	-0.13
Central AC Tune-up	957.31	98.5%	942.95	88.3%	832.29
Duct Sealing	484.34	114.7%	555.65	90.3%	501.79
Ductless Heat Pump	0.17	150.1%	0.25	102.1%	0.26
Smart Thermostat	0.00	N/A	0.00	102.1%	0.00
Total	**1,441.94**	**103.9%**	**1,498.68**	**89.2%**	**1,334.21**

Sums may differ due to rounding.

TABLE 8-3 PY13 AC SOLUTIONS LIFETIME SAVINGS SUMMARY

Measure	EUL	Ex Post Gross Lifetime Energy Savings (kWh)	Ex Post Net Lifetime Energy Savings (kWh)
Central AC Replacement	19	3,705	2,837
Central AC Tune-up	3	6,245,465	5,512,529
Duct Sealing	18	27,508,922	24,842,586
Ductless Heat Pump	18	36,261	37,040
Smart Thermostat	11	29,893	30,536
Total	**10**	**33,824,246**	**30,425,527**

Sums may differ due to rounding.

TABLE 8-4 PY13 AC SOLUTIONS COUNT OF MEASURES AND INCENTIVE SPEND

Measure	Participation (Count of Measures)	Incentive Spend ($)
Central AC Replacement	1	$500
Central AC Tune-up	2,521	$353,350
Duct Sealing	613	$212,639
Ductless Heat Pump	2	$750
Smart Thermostat	8	$1,200
Total	**3,145**	**$568,439**

Sums may differ due to rounding.

8.2 Program Description

A/C Solutions provides financial incentives to encourage residential customers to improve the efficiency of their HVAC systems; Franklin implements this program. Incentives are provided for ductless heat pumps, HVAC tune-up, HVAC replacements, duct sealing and smart thermostats.

Incentives for air conditioner replacements range from $50 to $150, depending on the size and SEER of the new unit. Incentives for ducted heat pumps range from $150 to $250, depending on size and SEER of the new unit. Ductless heat pumps may receive incentives ranging from $250 to $500 depending on the size of the unit.

Tune-ups are provided by a qualified trade ally and involve assessing the performance of the unit before and after measures are implemented. Typical measures implemented as part of the tune-up procedure include air flow correction; cleaning of the indoor blower, evaporator coils, condenser coils; and correction of refrigerant charge (if necessary).

Duct sealing is performed by applying mastic sealant or metal tape to the distribution system of air conditioning systems. Duct sealing performance is tested by taking the pre-measurement and post-measurement cubic feet per minute (CFM) leakage rate.

8.2.1 PROGRAM DELIVERY CHANNELS AND EXPECTED SAVINGS

Below, individual measure contribution to the overall program expected savings.

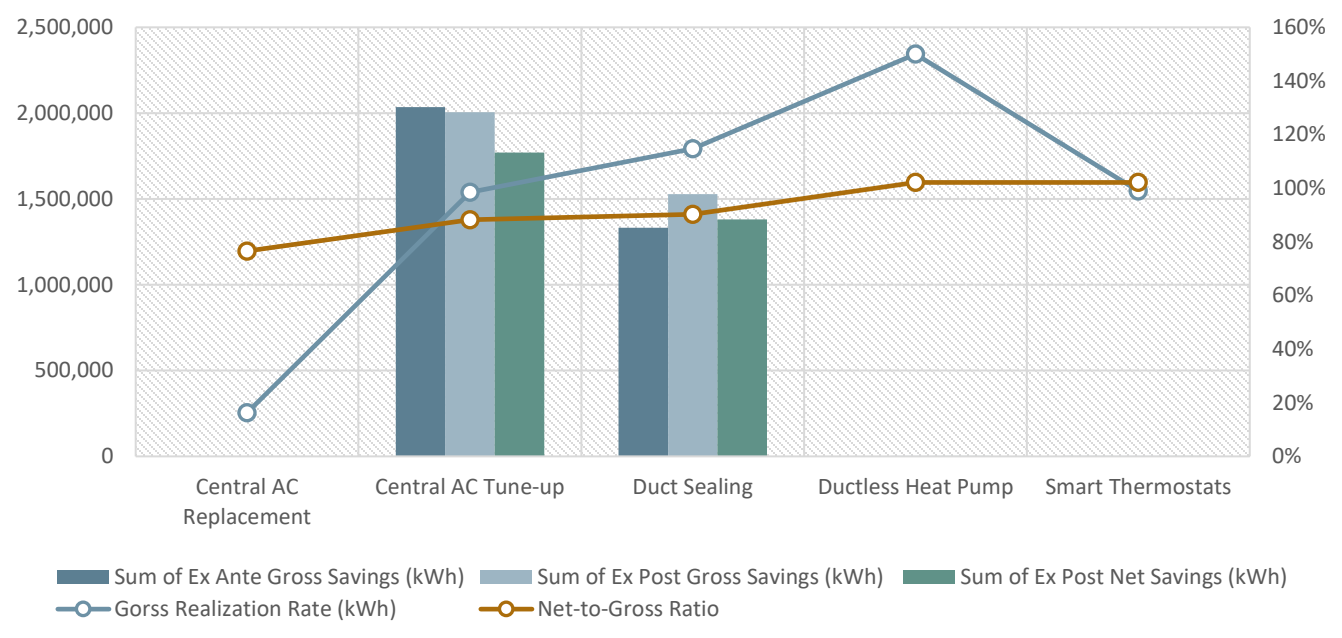
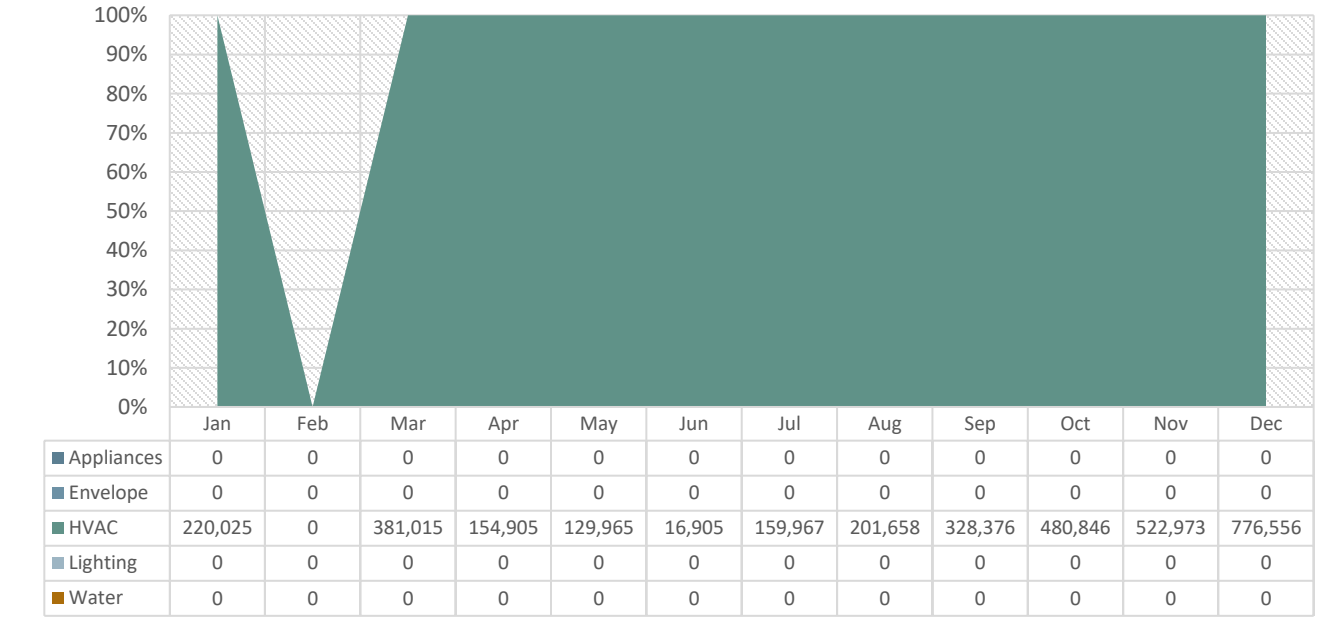


FIGURE 8-1 AC SOLUTIONS COMBINED SAVINGS CONTRIBUTION BY MEASURE

AC tune-ups (60.4%), duct sealing (39.5%) and smart thermostats (0.1%) were the high impact measures in the AC Solutions program. In PY13 there were 1,407 total distinct homes accounting for 3,373,191 kWh of expected energy savings, compared to 1,402,624 kWh of expected savings in PY13.

8.2.2 TIMING OF PROJECTS

The figure below shows *ex ante* energy savings (kWh) for the program by end use, by month.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Appliances	0	0	0	0	0	0	0	0	0	0	0	0
Envelope	0	0	0	0	0	0	0	0	0	0	0	0
HVAC	220,025	0	381,015	154,905	129,965	16,905	159,967	201,658	328,376	480,846	522,973	776,556
Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Water	0	0	0	0	0	0	0	0	0	0	0	0

FIGURE 8-2 *EX ANTE* BY END USE BY MONTH

8.2.3 TRADE ALLIES

The program had ten (10) participating trade allies identified in project data; there were also one unknown trade ally that installed an AC unit. Seven of the reported trade allies installed some combination of smart thermostats, duct sealing and performed AC tune-ups, including the two top performing trade allies. Two additional trade allies only performed AC tune-ups. The remaining trade allies installed ductless heat pumps.

The table below shows the distribution of savings across all trade allies.

TABLE 8-5 AC SOLUTIONS TRADE ALLY ACTIVITY

Trade Ally	*Ex Ante* Gross Energy Savings (kWh)	% of Savings
TA 1	2,278,860	68%
TA 2	352,478	10%
TA 3	310,402	9%
TA 4	295,741	9%
TA 5	132,321	4%
TA 6	1,196	< 1%
TA Unknown	745	< 1%
TA 8	598	< 1%
TA 9	567	< 1%
TA 10	283	< 1%

Sums may differ due to rounding.

8.2.4 GOAL ACHIEVEMENT

Total verified savings and percentage of goals for the program are summarized below.

TABLE 8-6 PY13 AC SOLUTIONS SUMMARY OF GOAL ACHIEVEMENT

Ex Post Gross Energy Savings (kWh) Goal	% to kWh Goal	Ex Post Gross Savings (kW) Target	% to kW Target
2,848,496	124%	NA	NA

8.3 EM&V Methodology

The evaluation approach for PY13 included the following activities: project data review, desk reviews, and site visits. Impact methodologies for the Program are the same as described for HPwES in Section 4.3.1, measures not covered are described below.

In PY13, savings for these measures are fully deemed based on the NO TRM V6.1.

TABLE 8-7 AC SOLUTIONS DATA COLLECTION ACTIVITIES

Evaluation Activity	Sample Size	Year Conducted	Impact	Process
Staff & TPI Interviews	4	PY13		X
Database Review	Census		X	X
Near-Participant Trade Ally Interviews	2	PY13		X
Desk Reviews			X	
Data Collection Form Review				X
Billing analysis: Average E_{base} (kWh/ton)			X	
Establish *RelSav* from field measurements			X	

8.3.1 SITE VISITS

The Evaluators performed eighteen site visits on projects in the program. The table below outlines the measures captured in the site visits.

TABLE 8-8 SITE VISIT SUMMARY

Measure	PY13 Participant Count	Found in PY13 Site Visit
Central AC Tune-up	2,521	6
Duct Sealing	613	4
Smart Thermostat	8	N/A
AC Replacement	1	N/A
Ductless Heat Pump	2	N/A

The results of site visits were blended with the participant survey responses to estimate in-service rates. Results are presented in the table below.

TABLE 8-9 MEASURE-SPECIFIC GROSS IMPACTS FOR AC SOLUTIONS

Measure	In-Service Rate	Source of ISR
AC Replacement	100.0%	
AC Tune-up	98.5%	
Duct Sealing	98.9%	
Ductless Heat Pump	100.0%	
Smart Thermostat	99.0%	

8.3.2 DEEMED SAVINGS CALCLULATIONS

8.3.2.1 AC Replacement

AC replacement savings were calculated using the savings methodology from the NO TRM V6.1, Section 1.3.1.2. The following equations outline the methodology that the Evaluators adhered to.

$$kWh_{Savings} = CAP_c \times \frac{1\text{ kW}}{1{,}000\text{ W}} \times \left(\frac{1}{SEER2_{pre}} - \frac{1}{SEER2_{post}}\right) \times EFLH_C$$

$$kW_{Reductions} = CAP_c \times \frac{1\text{ kW}}{1{,}000\text{ W}} \times \left(\frac{1}{EER2_{pre}} - \frac{1}{EER2_{post}}\right) \times \%\text{CF}$$

Where:

CAP_C = Cooling capacity (in BTU)

$SEER2_{pre}$ = Measured efficiency of the heating equipment before tune-up

$SEER2_{post}$ = Measured efficiency of the heating equipment after tune

$EER2_{pre}$ = Full-load efficiency of baseline equipment

$EER2_{post}$ = Full-load efficiency of efficient equipment

$EFLH_C$ = Equivalent Full Load Hours - cooling (1,637)

$\%CF$ = Peak coincidence factor

TABLE 8-10 CENTRAL AC REPLACEMENT SCENARIO BASELINES

Replacement Scenario	SEER2	EER2
New Construction / Replace-on-Burnout Split Systems < 45,000 btu/h	14.3	11.7
New Construction / Replace-on-Burnout Split Systems ≥ 45,000 btu/h	13.8	11.2 9.8 if efficient SEER2 ≥ 15.2
Early Retirement	12.3	10.6

8.3.2.2 Ductless Heat Pump Replacement

Ductless HP replacement savings were calculated using the savings methodology from the NO TRM V6.1, Section 1.3.4.5. The following equations outline the methodology that the Evaluators adhered to.

$$kWh_{Savings\ (Cooling)} = CAP_C \times \frac{1\ \text{kW}}{1{,}000\ \text{W}} \times \left(\frac{1}{SEER_{pre}} - \frac{1}{SEER_{post}}\right) \times EFLH_C$$

$$kWh_{Savings\ (Heating)} = CAP_H \times \frac{1\ \text{kW}}{1{,}000\ \text{W}} \times \left(\frac{1}{HSPF_{pre}} - \frac{1}{HSPF_{post}}\right) \times EFLH_H$$

$$kW_{Reductions} = CAP_C \times \frac{1\ \text{kW}}{1{,}000\ \text{W}} \times \left(\frac{1}{EER_{pre}} - \frac{1}{EER_{post}}\right) \times \%\text{CF}$$

Where:

CAP_H = Heating capacity of HP (in BTU)

$HSPF_{pre}$ = Heating Season Performance Factor of baseline equipment

$HSPF_{post}$ = Heating Season Performance Factor of efficient equipment

TABLE 8-11 CENTRAL AC REPLACEMENT SCENARIO BASELINES

Replacement Scenario	SEER2	EER2	HSPF2
New Construction / Replace-on-Burnout	14.3	11.7	7.5 (Split)
New Construction / Replace-on-Burnout	14.3	11.7	6.7 (Packaged)
Early Retirement (< Jan 1, 2015)	12.4	10.6	6.6
ER – ER to Heat Pump Replacement	13.3	10.6	2.89

8.3.2.3 Other Measures

For remaining measures, the Evaluators used the following NO TRM V6.1. The sections are in Table 8-12.

TABLE 8-12 NO TRM V6.1 SECTIONS FOR OTHER MEASURES

Measure	TRM Section	Calculated	TRM Table(s)	Table Page(s)
Ductless Heat Pump	1.3.6	Deemed	Table 1-88	116

8.4 Evaluation Findings

The findings of the evaluation are found in Section 8.1 Summary.

8.4.1 GROSS IMPACT FINDINGS

8.4.1.1 Central Air Conditioning Replacement

In PY13, the AC Solutions offering incentivized one central AC replacement. Expected and verified savings for central AC replacement project are summarized below. The low realization rate may be attributed to differences in baseline and efficiency values assumed in calculations. The Evaluators verified the unit make / model through the AHRI database and utilized a SEER II compliant baseline.

TABLE 8-13 PY13 AC SOLUTIONS EXPECTED AND VERIFIED CENTRAL AC REPLACEMENT SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
1,196	195	16.3%	0.13	-0.17	-129.3%

8.4.1.2 Central Air Conditioning Tune-up

There were 2,521 central AC tune-up projects in PY13. Expected and verified savings are summarized below.

TABLE 8-14 PY13 AC SOLUTIONS EXPECTED AND VERIFIED CENTRAL AC TUNE-UPS SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
2,035,841	2,005,324	98.5%	957.31	942.95	98.5%

8.4.1.3 Ductless Heat Pump Replacement

The program rebated two ductless heat pumps. The Evaluators calculated savings by applying deemed savings by claimed tonnage. Methods for calculating the deemed savings values came from the NO TRM V6.1, section 1.3.6. Ductless Heat Pump. Deemed per-unit kWh and kW reductions were applied. The higher realization rate may be attributed to deemed savings values being applied to the units assuming tonnages of 1.0, whereas the Evaluators utilized the actual unit tonnages.

TABLE 8-15 DUCTLESS HEAT PUMP DEEMED SAVINGS PER TONNAGE

Replacement Scenario	kWh per Ton	kW per Ton	Average Tons	kWh per Unit	kW per Unit
New Construction	598	0.064	3.01	1,801	0.19
Replace-on-Burnout	598	0.064	3.01	1,801	0.19
Early Retirement	745	0.1026	3.01	2,239	0.31

TABLE 8-16 PY13 AC SOLUTIONS EXPECTED AND VERIFIED DUCTLESS HP SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
1,343	2,015	150.0%	0.17	0.25	150.1%

8.4.1.4 Duct Sealing

There were 613 duct sealing projects. Expected and verified savings for duct sealing projects are summarized below. The higher realization rate may be due to improper SEER values being utilized in the ex ante estimations, as well as assuming 35% of total fan flow in CFM25 pre-retrofit value adjustments in ex ante estimations.

TABLE 8-17 PY13 AC SOLUTIONS EXPECTED AND VERIFIED DUCT SEALING SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
1,332,067	1,528,273	114.7%	484.34	555.65	114.7%

8.4.1.5 Smart Thermostat

The offering incentivized 8 smart thermostats. Expected and verified savings for smart thermostats are summarized below.

TABLE 8-18 PY13 MULTIFAMILY EXPECTED AND VERIFIED SMART THERMOSTATS SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
2,744	2,718	99.0%	0.00	0.00	N/A

8.4.1.6 Avoided Replacement Cost

There are no ARC in the program.

8.4.2 NET IMPACT FINDINGS

The program administrator provides trade ally recruitment, training, qualification, data acquisition tools and guidelines, and quality assurance and oversight. Under this program, qualified trade allies will perform services such as refrigerant charge adjustment, airflow optimization, coil cleaning, and air filter replacement. Incentives for HVAC system upgrades are available in addition to these services. HVAC savings have been well-established in the NO TRM V6.1 via metering and billing analysis studies.

The table below presents each NTG value and source. Free ridership was assessed using a participant survey for most measures. A literature review was performed to estimate spillover for central AC replacements due to a lack of survey responses for that measure. Spillover was assessed using the methodology described in section 3.3.2.4.6. The spillover ratio was 2.1%.

TABLE 8-19 AC SOLUTIONS NET IMPACTS

Measure	Net-to-Gross Ratio	Source of NTG
Central AC Replacement	76.6%	Literature Review; small sample
Central AC Tune-up	88.3%	Participant Survey
Duct Sealing	90.3%	Participant Survey
Ductless Heat Pump	102.1%	Participant Survey
Smart Thermostats	102.1%	Participant Survey

Results for overall verified net savings are shown below in Table 8-20.

TABLE 8-20 PY13 AC SOLUTIONS PROGRAM NET SAVINGS

Ex Post Gross Energy Savings (kWh)	*Ex Post* Net Energy Savings (kWh)	kWh NTG	*Ex Post* Gross Demand Reductions (kW)	*Ex Post* Net Demand Reductions (kW)	kW NTG
3,538,524	3,155,116	89.2%	1,498.68	1,334.21	89.2%

8.4.3 PROCESS FINDINGS

8.4.3.1 Staff and Implementer Interviews

The following section summarizes the key findings from in-depth interviews with two ENO program staff, one APTIM staff, and one Franklin staff; ENO staff participated in one interview and APTIM and Franklin staff participated in a second interview. These in-depth interviews aimed to learn more about AC Solutions program design and operations, and the successes and challenges experienced during PY13. Interviews lasted approximately 60 minutes and were conducted using the Microsoft Teams platform. The evaluators recorded all interviews with participant permission. The following narrative summarizes these interviews.

8.4.3.1.1 *Program Description*

A/C Solutions provides financial incentives to encourage residential customers to improve the efficiency of their HVAC systems; Franklin implements this program. Incentives are provided for ductless heat pumps, HVAC tune-up, HVAC replacements, duct sealing and smart thermostats.

Tune-ups are provided by a qualified trade ally and involve assessing the performance of the unit before and after measures are implemented. Typical measures implemented as part of the tune-up procedure include air

flow correction; cleaning of the indoor blower, evaporator coils, condenser coils; and correction of refrigerant charge (if necessary).

Duct sealing is performed by applying mastic sealant or metal tape to the distribution system of air conditioning systems. Duct sealing performance is tested by taking the pre-measurement and post-measurement cubic feet per minute (CFM) leakage rate.

8.4.3.1.2 *Program Implementation*

Unlike the other residential programs, AC Solutions is completely trade ally driven. The extent of program staff's involvement in implementation is connecting HPwES customers with a list of AC Solutions trade allies if their home assessment indicates they need AC Solutions related equipment upgrades.

Entergy lists trade allies on the Energy Smart website and interested customers are able to reach out to these trade allies directly to schedule work. In PY13 there were five active trade allies engaged in the program. Staff are looking to increase trade ally engagement with the program to increase overall participation. Although some of the HPwES trade allies also work with the AC Solutions program, both programs require different credentials and specialties.

Typically trade allies deduce incentive from customer bill and therefore trade ally receives the incentive rather than the customer.

8.4.3.1.3 *Marketing*

Due to EISA changes, the beginning of PY13 was focused on lightning related marketing, but beginning in July, staff pivoted marketing efforts to other measures, like those offered by AC Solutions. Because the program is trade ally driven, staff have focused efforts on streamlining and simplifying the application process for trade allies. Staff continue to employ some direct to customer marketing including bill inserts, emails, postcards, and social media advertisements.

8.4.3.2 Near Participant Trade Ally Interviews

Evaluators conducted interviews about participation in the Energy Smart A/C Solutions Residential savings program with near-participant trade allies to gather feedback about trade ally awareness and general knowledge of energy efficiency actions and Energy Smart's programs, as well as barriers to program engagement. "Near-participant" trade allies are trade allies who have previously participated in the Energy Smart program or have expressed interest in program engagement, but not yet enrolled. Entergy Smart tracking data for the Energy Smart A/C Solutions Residential savings program included six unique trade ally contacts in the program. Of these contacts, five had valid contact information. Trade allies were contacted via phone and email three times and invited to complete an interview. Two near-participants responded to an interview for a response rate of 40%.

8.4.3.2.1 *Program Strengths*

The two trade allies interviewed appreciate the program for its continuous improvement over the years, particularly in the streamlined process of assigning work and handling referrals. They highlight the evolution from a somewhat uncertain email-based system to a traceable and efficient process, allowing for better tracking of referrals and assessments. Additionally, the enhanced method of submitting paperwork for rebates is acknowledged as a positive development. The program's flexibility is also valued, with both trade allies

expressing satisfaction in having the option to bring in more customers and diversify their services, which presents new opportunities to offer additional benefits to their clients, such as home upgrades and electrical services.

> *"The easy part I have noticed, I think I've been in the program six years. It definitely has evolved, and they've made improvements over the years just in how they assign work to you, how if you have referrals, you can get set up so that they can go out and do assessments. It used to be kind of sketchy at one time where you send it to email and you didn't know if it went to a black hole somewhere. It's all traceable now you can track that. How you submit your paperwork for rebates has definitely improved." – Installer, Building Envelope*

> *"Process is easy. I just log in and there's a screen that you can filter what program that homeowner is in, and it gives you all their information and what measures they're approved for. It's pretty easy." – Installer, Building Envelope*

8.4.3.2.2 *Program Opportunities*

The trade allies express dissatisfaction with the program in various aspects. For one ally in particular, there is frustration with inconsistent timing of payment processing and uncertainty around the timing to receive payments. This ally shared that out-of-pocket costs could create financial challenges, especially when payment delays occur.

> *"I do find still there's a little hitch in the timing of how they process payments. I never quite see a steady. Is it two weeks before you get paid, a month before you get paid? It seems to be a roller coaster sometimes." – Installer, Building Envelope*

One trade ally has encountered issues of duplicate project assignments or customers expecting more measures than approved. This ally shared that issues like these pose challenges in project execution with then requires additional customer service efforts. The overwhelming volume of job assignments without considering a trade allies' company size creates backlogs, leading to inefficiencies and potential burnout. Both allies shared that they sometimes have difficulty in convincing customers to upgrade for energy savings, particularly when there are upfront costs which further complicates the trade allies' participation in the program.

8.4.3.2.3 *Deeper Trade Ally Engagement*

To enhance engagement with the program, both trade allies highlight the crucial need for clear communication regarding payment processing schedules. Consistency in this area would alleviate uncertainties for customers and improve trust in trade allies. They also suggest providing tangible resources, such as official documentation or letterheads, that trade allies can share with customers to boost credibility and make clients feel more secure about participating in the program. The lack of visible documentation makes it challenging to sell services to customers who prefer tangible proof. Both trade allies propose the creation of marketing materials, including flyers and commercials, to raise awareness and promote the program. Collaborative efforts between trade allies, Aptim, and ENO in marketing and advertising could significantly contribute to customer engagement.

> *"If I had something in hand that I could bring to my customers, it may make them feel more secure by doing it. Documentation, stuff in hand, makes things a little easier, but people just don't. You can tell them, but people want to see things. That's my feeling on it."* – Installer, Lighting Controls

8.5 Data Tracking Review

The Evaluators reviewed the implementer-provided tracking data and noted that the fields that were missing in PY13 data were generally present in PY13. The following bullets outline notes from reviewing the A/C Solutions data:

- Installation dates: the Evaluators noted that installation dates were added in for PY13
- Trade ally information: In general, Trade Ally primary contact names, company names, contact phone numbers, and email addresses were provided in PY13 data, however, there were a handful of projects that were missing these fields:
  - Trade ally primary company name: 1 project in 1 distinct home (1 out of 1,407 homes)
  - Trade ally primary contact name: 4 projects (4 distinct homes out of 1,407)
  - Trade ally main phone number: 5 projects (5 distinct homes out of 1,407)
  - Trade ally email address: 406 projects (89 distinct homes out of 579)
- Participant information: In general, participant contact names, contact phone numbers, and email addresses were provided in PY13 data, however, there were many projects that were missing these fields:
  - Participant main phone number: all projects had a phone number listed
  - Participant email address: 550 projects (300 distinct homes out of 579)
- Measure-level parameters: the following is an outline of missing or problematic parameters needed for savings calculations by measure:
  - Ductless HP: there were discrepancies in the capacity tons in which the tracking data had different tonnages reported in the 'Current Units' and the 'Cooling Capacity Tons' fields that resulted in ex ante being calculated based on 'Current Units'. The 'Current Units' field was a quantity of one for both projects.

In addition to the tracking data issues described above, the Evaluators noted that make and model numbers for the AC replacement and ductless HP projects were not included. Having unit make and model numbers allows the Evaluators to verify efficiencies that may result in increased verified energy savings and demand reductions based on the methodologies in the NOLA TRM V6.1.

8.6 Findings and Conclusions

Findings and Conclusions:

- Program Improvements: Trade allies appreciate the continuous improvements in the program, particularly in streamlining work assignments and handling referrals.
- Challenges Faced: However, trade allies express dissatisfaction with inconsistent payment processing times and difficulties in project execution due to duplicate assignments and customer expectations.

Recommendations:

- Communication with Trade Allies: Increasing communication with trade allies to ensure clarity on payment schedules and project expectations is essential for program success.
- Enhanced Marketing Efforts: Providing tangible resources for credibility and collaborative marketing efforts to raise awareness and promote program participation will further enhance program effectiveness.

9 SCHOOL KITS AND EDUCATION

9.1 Summary

The tables below report *ex ante* gross, *ex post* gross, *ex post* net energy savings (kWh) (both annual and lifetime), demand reductions (kW), participation, and incentive spend, by kit.

TABLE 9-1 PY13 SK&E ENERGY SAVINGS (KWH)

Measure	*Ex Ante* Gross Savings (kWh)	Realization Rate (kWh)	*Ex Post* Gross Savings (kWh)	NTG	*Ex Post* Net Savings (kWh)
LED Lamp 9W (A Type)	123,060	104.4%	128,503	100.0%	128,503
LED Lamp 14W (A Type)	106,570	99.7%	106,273	100.0%	106,273
Low-Flow Showerhead	321,679	104.4%	335,816	100.0%	335,816
Kitchen Aerator (1.5)	27,565	126.9%	34,982	100.0%	34,982
Bathroom Aerator (1.0)	45,409	133.1%	60,432	100.0%	60,432
Weather Stripping (17")	39,502	118.9%	46,970	100.0%	46,970
Total	**663,786**	**107.4%**	**712,976**	**100.0%**	**712,976**

Sums may differ due to rounding.

TABLE 9-2 PY13 SK&E DEMAND REDUCTIONS (KW)

Measure	*Ex Ante* Gross Demand (kW)	Realization Rate (kW)	*Ex Post* Gross Demand (kW)	NTG	*Ex Post* Net Demand (kW)
LED Lamp 9W (A Type)	20.51	106.4%	21.83	100.0%	21.83
LED Lamp 14W (A Type)	16.41	110.0%	18.05	100.0%	18.05
Low-Flow Showerhead	32.82	106.4%	34.92	100.0%	34.92
Kitchen Aerator (1.5)	4.10	88.7%	3.64	100.0%	3.64
Bathroom Aerator (1.0)	4.10	153.2%	6.28	100.0%	6.28
Weather Stripping (17")	4.10	125.1%	5.13	100.0%	5.13
Total	**82.04**	**109.5%**	**89.86**	**100.0%**	**89.86**

Sums may differ due to rounding.

TABLE 9-3 PY13 SK&E LIFETIME SAVINGS SUMMARY

Measure	EUL	*Ex Post* Gross Lifetime Energy Savings (kWh)	*Ex Post* Net Lifetime Energy Savings (kWh)
LED Lamp 9W (A Type)	3	321,258	321,258
LED Lamp 14W (A Type)	3	265,683	265,683
Low-Flow Showerhead	10	3,358,156	3,358,156
Kitchen Aerator (1.5)	10	349,825	349,825
Bathroom Aerator (1.0)	10	604,316	604,316
Weather Stripping (17")	11	516,668	516,668
Total	**8**	**5,415,907**	**5,415,907**

Sums may differ due to rounding.

TABLE 9-4 PY13 SK&E PARTICIPATION AND INCENTIVE SUMMARY

Measure	Participation (Count of Measures)	Incentive Spend ($)
LED Lamp 9W (A Type)	16,408	$37,738
LED Lamp 14W (A Type)	8,204	$18,869
Low-Flow Showerhead	4,102	$9,435
Kitchen Aerator (1.5)	4,102	$9,435
Bathroom Aerator (1.0)	4,102	$9,435
Weather Stripping (17")	4,102	$9,435
Total	**4,102**	**$94,346**

Sums may differ due to rounding.

9.1.1 PROGRAM DESCRIPTION

The School Kits and Education (SK&E) program provides classroom education on energy use and saving energy, as well as energy efficiency kits to students. SK&E staff also perform outreach activities to promote energy efficiency.

PY13 marked the first year of the program utilizing a new implementer: National Children's Theater. National Children's Theater works with seven utilities across the country to implement an educational program in schools that employs the theater to teach students about energy efficiency, energy usage, and sustainability. The plays last approximately 25-minutes and is presented to the entire student body.

Following the theatrical production, 2nd and 5th grade students receive energy saving kits to bring home. Kits include weatherstripping, a low flow showerhead, a kitchen faucet aerator, a bathroom faucet aerator, and LEDs. Kits also have a QR code that helps families access a resource guide and enables them to indicate which equipment they do and do not install. Classroom teachers also receive a digital toolkit they can use to teach students about energy efficiency and sustainability; tool kit resources include graphic novels, games, and quizzes.

The Evaluator interviewed the School Wise Kits, Education, and Community Outreach Manager. Unlike the other residential programs, the school kit program operates on the standard school calendar year, rather than annual calendar year.

9.1.1.1 Program Delivery Channels and Expected Savings

The program received a limited impact and process evaluations. The evaluations provided free-ridership estimates, discussions of program satisfaction and strategic recommendations for program improvement.

Below, individual measure contribution to the overall program expected savings are summarized.

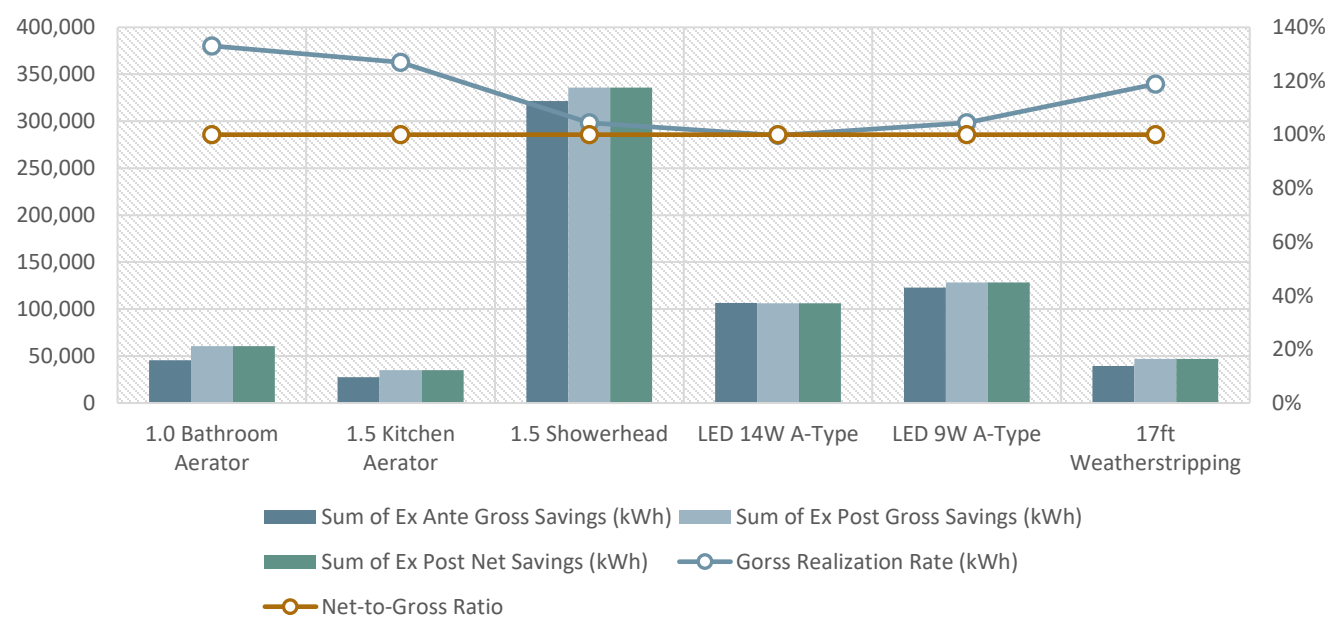


FIGURE 9-1: SK&E ENERGY SAVINGS (KWH) SUMMARY

In PY13, the 1.5 GPM low-flow showerhead accounted for 48.5% of expected energy (kWh) savings, the 9W A-Type LED lamp accounted for 18.5%, the 14W A-Type LED lamp accounted for 16.5%, the 1.0 GPM bathroom aerator accounted for 6.8%, the 17 ft weatherstripping accounted for 6.0%, and the 1.5 GPM kitchen aerator accounted for 4.2% of total expected energy savings.

Overall, the program claimed 663,786 kWh expected savings in PY13.

9.1.1.2 Timing of Projects

There are no dates reported in the program data.

9.1.1.3 Trade Allies

There are no trade allies in the program.

9.1.1.4 Goal Achievement

Total verified savings and percentage of goals for the program are summarized in the table below.

TABLE 9-5 PY13 SK&E SUMMARY OF GOAL ACHIEVEMENT

Ex Post Gross Energy Savings (kWh) Goal	% to kWh Goal	Ex Post Gross Savings (kW) Target	% to kW Target
797,088	89%	NA	NA

9.2 EM&V Methodology

Electricity savings and peak demand reductions were estimated using inputs from the NO TRM V6.1. Measure-specific savings are provided below.

9.2.1 SITE VISITS

There are no site visits in the SK&E. School kits were distributed along with a survey form to be filled out by students and parents, then returned. The forms included questions regarding which measures had been installed in the home as well as home characteristics. This information was used to determine ISR estimates for each measure, and the prevalence of electric water heating in homes as a whole. These ISRs were applied.

TABLE 9-6 ISR SUMMARY FOR SK&E

Kit Item	In-Service Rate	Source of ISR
1.0 Bathroom Aerator	59.6%	PY13 Student Survey and literature review
1.5 Kitchen Aerator	57.5%	
1.5 Showerhead	64.8%	
LED 14W A-Type	71.0%	
LED 9W A-Type	73.3%	
17 ft Weatherstripping	69.8%	
Water Heater Electric Fuel %	55.4%	

9.2.2 DEEMED SAVINGS CALCULATIONS

Calculation inputs for LED lamps are outlined below. These savings serve as the foundation on which expected savings are built upon.

TABLE 9-7 ENERGY STAR OMNIDIRECTIONAL LEDS – DEEMED SAVINGS PER LAMP

Minimum Lumens	Maximum Lumens	LED Wattage	Incandescent Equivalent 1st Tier EISA 2007 (W_{base})
310	749	7	29
750	1,049	9	43
1,050	1,489	12	53
1,490	2,600	15	72

$$kWh_{savings} = \left((W_{base} - W_{post})/1000\right) \times Hours \times ISR^{8} \times IEF_{E}{}^{9}$$

$$9W\ LED\ kWh_{savings} = 4 \times \left(\frac{(43-9)}{1000}\right) \times 819.43 \times 1 \times 0.91 = 101.41\ kWh$$

$$15W\ LED\ kWh_{savings} = 2 \times \left(\frac{(72-15)}{1000}\right) \times 819.43 \times 1 \times 0.91 = 85.01\ kWh$$

Deemed savings for faucet aerators are outlined below.

[8] 100% in this calculation. Measure-specific ISR applied after.

[9] Unknown heating type: 0.91

TABLE 9-8 FAUCET AERATORS – DEEMED SAVINGS

Efficient GPM Rating	Deemed kWh Savings	Deemed kW Reductions
1.5 GPM	26.80	0.0028
1.0 GPM	44.66	0.0046

Deemed savings for low-flow showerheads are outlined below.

TABLE 9-9 FAUCET AERATORS – DEEMED SAVINGS

1.50 GPM Showerhead Deemed Savings		
Water gal. saved /year/showerhead @ 1.5 GPM	2,860	
$T_{\_Supply}$	74.8°F	
$T_{\_Mixed}$	106.8°F	
Water heater EF (excluding standby losses)	0.98 (Electric Resistance) / 2.2 (Heat Pump)	
Energy Savings	Electric: 26.8 kWh	Heat Pump: 11.94 kWh
Demand Savings	Electric: 0.0028 kW	Heat Pump: 0.0012 kW

9.3 Evaluation Findings

Evaluation findings are reported in Section 9.1 Summary.

9.3.1 GROSS IMPACT FINDINGS

Ex post gross savings are 663,786 kWh and 89.86 kW. Savings are summarized in Table 9-10 below.

TABLE 9-10 PY13 SK&E EXPECTED AND VERIFIED SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
663,786	712,976	107.4%	82.04	89.86	109.5%

9.3.1.1 Avoided Replacement Cost

The Evaluators have added the benefits of avoided replacement costs (ARC). The table below summarizes the ARC by measure in SK&E. Information on methodology can be found in Section 3.4.1.3 Avoided Replacement Costs.

TABLE 9-11 SUMMARY OF ARC FOR SK&E

Ex Post Gross ARCs ($)	*Ex Post* Net ARCs ($)	NPV ARCs ($)
$5,252	$5,252	$5,252

Sums may differ due to rounding.

9.3.2 NET IMPACT FINDINGS

For SK&E, NTG is deemed at 1.0, which is industry standard for a school kits program.

TABLE 9-12 PY13 SK&E PROGRAM NET SAVINGS

Verified Gross kWh Savings	Verified Net kWh Savings	kWh NTG	Verified Gross kW Reductions	Verified Net kW Reductions	kW NTG
712,976	712,976	100.0%	89.86	89.86	100.0%

Individual measure net savings are summarized in Section 9.1 Summary.

9.3.3 PROCESS FINDINGS

The evaluation of the SK&E is dependent upon collection of adequate data at the time of implementation. The past survey issued to program participants by program staff collected in-service rate data for the equipment included with the kit. Further, this survey allowed participants to indicate willingness to complete a telephone or web-based survey. Our approach for this program was to survey respondents, which have agreed to provide the needed contact information.

The survey collected key data points including:

- What items in the kit did they install;
- What type of water heating do they have; and
- Basic satisfaction rating questions.

With this data, we then applied in-service rates and stipulated per-unit savings to develop program savings results.

9.3.3.1 Staff and Implementer Interview

The following section summarizes the key findings from in-depth interviews with two ENO program staff and two National Children's Theater staff; ENO staff participated in one interview and National Children's Theater staff participated in a second interview. These in-depth interviews aimed to learn more about School Kits program design and operations, and the successes and challenges experienced during PY13. Interviews lasted approximately 60 minutes and were conducted using the Microsoft Teams platform. The evaluators recorded all interviews with participant permission. The following narrative summarizes these interviews.

9.3.3.1.1 *Program Design and Implementation*

PY13 marked the first year of the School Kits program utilizing a new implementer: National Children's Theater. National Children's Theater works with seven utilities across the country to implement an educational program in schools that employs the theater to teach students about energy efficiency, energy usage, and sustainability. The plays last approximately 25-minutes and is presented to the entire student body.

Following the theatrical production, 2nd and 5th grade students receive energy saving kits to bring home. Kits include weatherstripping, a low flow showerhead, a kitchen faucet aerator, a bathroom faucet aerator, and LEDs. Kits also have a QR code that helps families access a resource guide and enables them to indicate which equipment they do and do not install. Classroom teachers also receive a digital toolkit they can use to teach students about energy efficiency and sustainability; tool kit resources include graphic novels, games, and quizzes.

Performances occurred in the winter and spring of the 2022-2023 school year. 4,100 skits were distributed across 23 participating schools.

9.3.3.1.2 *Marketing*

Staff explained that school outreach is the key to their success. They recruit schools through direct outreach to principals and administrators. Program visits different schools every year so there are not previous 2nd graders receiving kits as a 5th grader.

9.3.3.2 Participant Survey

National Children Theater staff implement a survey of teachers whose students received kits through the School Kits Program. Tracking data demonstrate that 4,008 school kits were distributed across 29 schools. Among these 29 schools, 5,018 students attended productions.

In general, respondent teachers were satisfied with the School Kits program, with an average score of 6.5 or higher for each program attribute (scale of 1-7). Moreover, 100% of teachers surveyed noted they would attend the program if it was offered again, and 1,005 teachers said they would recommend the program to colleagues.

9.4 Data Tracking Review

The Evaluators reviewed the implementer-provided tracking data and noted that the fields that were missing in PY13 data were still missing in PY13. The following bullets outline notes from reviewing the data:

- Shipping dates: shipping dates or dates of any kind were not included in the tracking data in PY13.
- Participant information: The Evaluators noted that participants was added in for PY13.
- Measure-level parameters required for savings calculations: In PY13, measure-level savings estimations were provided. The additional details in the data helped to ensure that the proper NO TRM methodologies were followed.

9.5 Findings and Conclusions and Recommendations

There were no findings for the SK&E program.

Recommendations:

- Consider adding Advanced Power Strips to kit offering. It may be worthwhile to include APS units in the kit offering to either supplement the current kit or to replace the LED lamps as EISA policy impacts are further realized after the July 1st, 2023 enforcement. The Evaluators have seen successful measure implementation in similar programs.

10 APPLIANCE RECYCLING AND REPLACEMENT

10.1 Summary

The tables below report *ex ante* gross, *ex post* gross, *ex post* net energy savings (kWh) (both annual and lifetime), demand reductions (kW), participation, and incentive spend, by measure, where applicable.

TABLE 10-1 PY13 AR&R ENERGY SAVINGS (KWH)

Measure	*Ex Ante* Gross Savings (kWh)	Realization Rate (kWh)	*Ex Post* Gross Savings (kWh)	NTG	*Ex Post* Net Savings (kWh)
Freezer Recycling	5,200	102%	5,280	57%	2,983
Refrigerator Recycling	106,784	98%	104,434	51%	53,261
Refrigerator Replacement	11,560	32%	3,743	81%	3,044
Total	**123,544**	**92%**	**113,457**	**52%**	**59,289**

Sums may differ due to rounding.

TABLE 10-2 PY13 AR&R DEMAND REDUCTIONS (KW)

Measure	*Ex Ante* Gross Demand (kW)	Realization Rate (kW)	*Ex Post* Gross Demand (kW)	NTG	*Ex Post* Net Demand (kW)
Freezer Recycling	0.63	103%	0.65	57%	0.37
Refrigerator Recycling	13.16	98%	12.90	51%	6.58
Refrigerator Replacement	0.18	306%	0.55	80%	0.44
Total	**13.97**	**101%**	**14.10**	**52%**	**7.39**

Sums may differ due to rounding.

TABLE 10-3 PY13 AR&R LIFETIME SAVINGS SUMMARY

Measure	EUL	*Ex Post* Gross Lifetime Energy Savings (kWh)	*Ex Post* Net Lifetime Energy Savings (kWh)
Recycled Freezer	12	63,360	35,798
Replaced Refrigerator	17	1,775,378	905,443
Recycled Refrigerator	17	63,626	51,749
Total	**15**	**1,902,364**	**992,990**

Sums may differ due to rounding.

TABLE 10-4 PY13 AR&R COUNT OF MEASURES AND INCENTIVE SPEND

Measure	Participation (Count of Measures)	Incentive Spend ($)
Recycled Freezer	8	$400
Replaced Refrigerator	94	$4,700
Recycled Refrigerator	100	$80,000
Total	**202**	**$85,100**

Sums may differ due to rounding.

10.1.1 PROGRAM DESCRIPTION

The Appliance Recycling and Replacement (AR&R) program offering encourages early recycling of qualifying low efficiency appliances, such as refrigerators and freezers, for residential customers. The program also offers refrigerator replacement options for income-qualified residential customers. This new offering goes beyond federal recycling requirements using environmentally friendly best practices for recycling all components of each appliance.

The program is designed to help ENO residential customers recycle inefficient appliances to receive a new efficient refrigerator appliance replacement. The program adheres to the following guidelines:

- Only residential customers that receive their electric service from ENOs can participate in this program;
- Standard size refrigerators and freezers are eligible (10-30 cubic feet); mini fridges are not eligible;
- Only refrigerators or freezers that are in operating condition qualify for recycling or replacement. If the unit is not functional, as determined by the Implementer staff onsite, the unit will not be collected, and the customer will not receive an incentive;
- Customers are required to be onsite at the time of appliance testing and collection;
- The Implementer will recycle and replace a maximum of one appliance per year, per customer account; and

Customers are eligible to receive an incentive of $50 per appliance recycled and may receive an energy efficient replacement refrigerator, if qualified and supplies are available.

Below, individual measure contribution to the overall program expected savings are summarized.

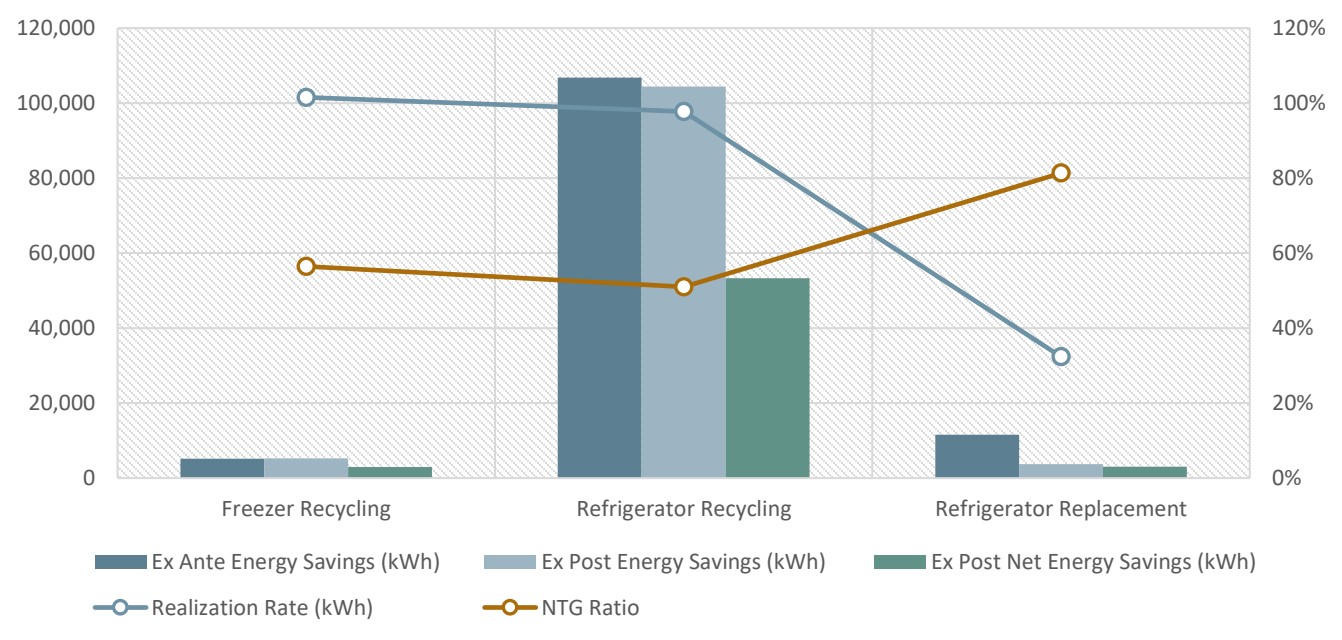


FIGURE 10-1: AR&R SAVINGS SUMMARY

10.2 EM&V Methodology

Impact savings were calculated using methods and inputs in the NO TRM V6.1. Impact methodologies for the refrigerator replacement projects are the same as described for RLA, described in Section 6.3.1.

The following section discusses savings calculation methods for measures not covered.

10.2.1 SITE VISITS

There were no site visits in PY13. However, the Evaluators completed three (3) ride-along with the implementation staff in order to gather insights into the program.

Additionally, a participant survey was performed. All 17 responses confirmed participation in the program. All installation rates are 100%.

10.2.2 DEEMED SAVINGS CALCULATIONS

10.2.2.1 Freezer Recycling

Freezer recycling savings were calculated using the savings methodology from the NO TRM V6.1, section 1.1.11.4.2. The following table outlines the methodology that the Evaluators adhered to.

TABLE 10-5 COEFFICIENTS FOR FREEZER RECYCLING SAVINGS

Independent Variable	Estimated Coefficient	Default Input	kWh Impact
Intercept	- 0.296	1	- 108.04
Age (years)	0.039	17.10	243.42
Pre-1990	0.486	0.081	14.37
Size (cubic feet)	0.104	15.9	603.56
Freezer Chest	0.122	0.119	5.30
Side-by-Side	0.957	0.323	112.83
Unconditioned x CDD	- 0.002	0.741 * 3,470	- 5.14
Unconditioned x HDD	0.024	0.741 * 1,058	18.82
Total Unit Energy Consumption			772
Part-Use Adjustment			85.5%
Default kWh Savings			660

$$Savings_{kWh} = \begin{bmatrix} -0.296 + (Age \times 0.039) + (Pre_{1990} \times 0.486) + (Size \times 0.104) \\ +(Freezer\ Chest \times 0.122) + (Unconditioned_{CDD} \times -0.002) \\ +(Unconditioned_{HDD} \times 0.024) \end{bmatrix} \times 365.25 \times 0.855$$

Where:

Age = Age of retired unit

Pre_{1990} = Pre-1990 dummy (= 1 if manufactured pre-1990, else 0)

$Size$ = Capacity (cubic feet) of retired unit

$Freezer\ Chest$ = Freezer chest dummy (= 1 if unit has freezer chest, else 0)

0.855 = Part-use, accounting for units that are not running all year = 85.5%

$$Reductions_{kW} = \frac{Savings_{kWh}}{8{,}760} \times CF$$

Where: CF = Coincidence factor = 1.065 for freezers

10.2.2.2 Refrigerator Recycling

Refrigerator recycling savings were calculated using the savings methodology from the NO TRM V6.1, section 1.1.11.4.1. The following table outlines the methodology that the Evaluators adhered to.

TABLE 10-6 COEFFICIENTS FOR REFRIGERATOR RECYCLING SAVINGS

Independent Variable	Estimated Coefficient	Default Input	kWh Impact
Intercept	0.750	1	273.75
Age (years)	0.032	17.10	199.73
Pre-1990	1.140	0.081	33.70
Size (cubic feet)	0.067	19.00	464.65
Single Door	- 1.085	0.039	- 15.44
Side-by-Side	0.957	0.323	112.83
Primary Usage	0.477	0.696	121.18
Unconditioned x CDD	0.007	0.259 * 3,470	6.29
Unconditioned x HDD	- 0.016	0.259 * 1,058	- 4.38
Total Unit Energy Consumption			1,192
Part-Use Adjustment			93.2%
Default kWh Savings			1,111

$$Savings_{kWh} = \begin{bmatrix} 0.75 + (Age \times 0.032) + (Pre_{1990} \times 1.140) + (Size \times 0.067) \\ +(Single\ Door \times -1.085) + (\text{Side} - \text{by} - \text{Side} \times 0.957) \\ +(Primary\ Usage \times 0.477) + (Unconditioned_{CDD} \times 0.007) \\ +(Unconditioned_{HDD} \times -0.016) \end{bmatrix} \times 365.25 \times 0.932$$

Where:

Age = Age of retired unit

Pre_{1990} = Pre-1990 dummy (= 1 if manufactured pre-1990, else 0)

$Size$ = Capacity (cubic feet) of retired unit

$Single\ Door$ = Single door dummy (= 1 if one door, else 0)

$Side - by - side$ = Side-by-side dummy (= 1 if side-by-side, else 0)

$Primary\ Usage$ = Primary usage type dummy (= 1 if Primary, else 0)

$Unconditioned_{CDD}$ = Weather interaction effect, New Orleans CDD base 65 °F = 3,470

$Unconditioned_{HDD}$= Weather interaction effect, New Orleans CDD base 65 °F = 1,058

0.932 = Part-use, accounting for units that are not running all year = 93.2%

$$Reductions_{kW} = \frac{Savings_{kWh}}{8{,}760} \times CF$$

Where: CF = Coincidence factor = 1.082 for refrigerators

10.3 Evaluation Findings

10.3.1GROSS IMPACT FINDINGS

10.3.1.1 Freezer Recycling

Expected and verified savings for the PY13 AR&R recycled freezers are summarized below. Eight freezers were recycled.

TABLE 10-7 PY13 AR&R PROGRAM EXPECTED AND VERIFIED RECYCLED FREEZER SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
5,200	5,280	101.5%	0.63	0.65	103.2%

10.3.1.2 Refrigerator Recycling

Expected and verified savings for the PY13 AR&R recycled refrigerators are summarized below. Ninety-four refrigerators were recycled.

TABLE 10-8 PY13 AR&R PROGRAM EXPECTED AND VERIFIED RECYCLED REFRIGERATOR SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
106,784	104,434	97.8%	13.16	12.90	98.0%

10.3.1.3 Refrigerator Replacement

ENERGY STAR Refrigerator savings were calculated using the deemed savings from the NO TRM V6.1, section 1.1.4.1. After verifying model configurations and features, deemed savings were assigned to each unit using TRM. Expected and verified savings for refrigerators are summarized below. There were 104 replacements in PY13.

The lower realization rate may be attributed to differences in refrigerator configuration and volume assumptions. The Evaluators noted that most of the savings estimations for the units seemed to align with 'Built-in refrigerator-freezers—automatic defrost with top-mounted freezer without an automatic ice maker with TTD ice service'.

TABLE 10-9 AR&R PROGRAM EXPECTED AND VERIFIED REPLACED REFRIGERATOR SAVINGS

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
11,560	3,743	32.4%	0.18	0.55	307.3%

10.3.2 NET IMPACT FINDINGS

The Evaluators performed a participant survey to determine NTG for the measure offerings in the AR&R.

Results for overall verified net savings are shown by measure in Section 10.1 Summary.

10.3.3 PROCESS FINDINGS

The Evaluators conducted a limited process evaluation of the RLA program in PY13 of the program.

10.3.3.1 Staff and Implementer Interviews

The following section summarizes the key findings from in-depth interviews with two ENO program staff, one APTIM staff, and one ARCA staff; ENO staff participated in one interview and APTIM and ARCA staff participated in a second interview. These in-depth interviews aimed to learn more about Appliance Recycling program design and operations, and the successes and challenges experienced during PY13. Interviews lasted approximately 60 minutes and were conducted using the Microsoft Teams platform. The evaluators recorded all interviews with participant permission. The following narrative summarizes these interviews.

10.3.3.1.1 *Program Design and Implementation*

The Appliance Recycling Program targets income qualified program participants with equipment being reviewed and replaced during the home assessment. In order to qualify, standard units must be working at time of replacement. Equipment eligible for replacement includes standard refrigerators and standard refrigerators, freezer, and combination units for recycling.

Although the documented program goal in PY13 was 1,200 recycled units and 200 replacement units, the more realistic and operational goal was 100 replacement units and 400-500 recycled units. The program goals and operational goals were incongruous because staff acknowledged that the original goals were unrealistic following the previous years' program performance.

In general, program staff find a stronger interest in replacements than recycling. Most of the target demographic do not have the resources to recycle working equipment and the cost savings from efficient are equipment are not enough to make up the price difference of new equipment.

Other program challenges include high fixed costs such as labor, storage, and fuel.

Staff have considered adding other appliances to the program but have determined other units to not be as cost effective.

10.3.3.1.2 *Marketing*

Staff promote the program during home assessments as well as through bill inserts, mailers, social media, and website page.

10.4 Data Tracking Review

The Evaluators reviewed the implementer-provided tracking data. The following bullets outline notes from reviewing the AR&R data:

- Installation / rebate dates: the Evaluators noted that installation / rebate dates were missing in the PY13 data. There are project start dates and payment dates, but they may be different.
- Participant information: In general, participant contact names, contact phone numbers, and email addresses were provided in PY13 data, however, there were many projects that were missing these fields:
    - Participant main phone number: 178 projects in 173 distinct homes (173 homes out of 201)
    - Participant email address: 78 projects (74 distinct homes out of 325)
- Measure-level parameters: the following is an outline of missing or problematic parameters needed for savings calculations by measure:
    - Refrigerator Replacements: there were a few instances in which the refrigerator model numbers in the 'Efficient Equipment Model' field were switched with the part numbers in the 'Efficient Equipment Part Number' field

10.5 Findings and Recommendations

There were no findings or recommendations for the AR&R program.

11 BEHAVIORAL

11.1 Summary

The tables below report *ex ante* gross, *ex post* gross, *ex post* net energy savings (kWh) (both annual and lifetime), demand reductions (kW), and participation, by cohort, where applicable.

TABLE 11-1 PY13 BEHAVIORAL ENERGY SAVINGS (KWH)

Measure	*Ex Ante* Gross Energy Savings (kWh)	Realization Rate (kWh)	*Ex Post* Gross Energy Savings (kWh)	NTG	*Ex Post* Net Energy Savings (kWh)
Neighbor Compare – ADM	4,079,296	0.00%	0	100%	0
Neighbor Compare – New	5,532,926	82.13%	4,544,379	100%	4,544,379
Neighbor Compare – Original	2,366,357	0.00%	0	100%	0
Neighbor Compare – Print	969,236	137.89%	1,336,439	100%	1,336,439
Self-Compare – New	663,850	0.00%	0	100%	0
Self-Compare – Original	456,250	128.32%	585,476	100%	585,476
Total	**14,067,914**	**45.96%**	**6,466,294**	**100%**	**6,466,294**

Sums may differ due to rounding.

TABLE 11-2 PY13 BEHAVIORAL DEMAND REDUCTIONS (KWH)

Measure	*Ex Ante* Gross Demand Reductions (kW)	Realization Rate (kW)	*Ex Post* Gross Demand Reductions (kW)	NTG	*Ex Post* Net Demand Reductions (kW)
Neighbor Compare – ADM	-	N/A	0.00	100%	0.00
Neighbor Compare – New	-	N/A	766.82	100%	766.82
Neighbor Compare – Original	-	N/A	0.00	100%	0.00
Neighbor Compare – Print	-	N/A	225.51	100%	225.51
Self-Compare – New	-	N/A	0.00	100%	0.00
Self-Compare – Original	-	N/A	98.79	100%	98.79
Total	**-**	**N/A**	**1,091.12**	**100%**	**1,091.12**

Sums may differ due to rounding.

TABLE 11-3 PY13 BEHAVIORAL LIFETIME SAVINGS SUMMARY

Measure	EUL	*Ex Post* Gross Lifetime Energy Savings (kWh)	*Ex Post* Net Lifetime Energy Savings (kWh)
Neighbor Compare – ADM	1	0	0
Neighbor Compare – New	1	4,544,379	4,544,379
Neighbor Compare – Original	1	0	0
Neighbor Compare – Print	1	1,336,439	1,336,439
Self-Compare – New	1	0	0
Self-Compare – Original	1	585,476	585,476
Total	**1**	**6,466,293.64**	**6,466,293.64**

Sums may differ due to rounding.

TABLE 11-4 PY13 BEHAVIORAL PARTICIPATION BY COHORT

Measure	Weighted Treatment Customers	Weighted Control Customers
Neighbor Compare – ADM	21,384	6,293
Neighbor Compare – New	29,004	3,309
Neighbor Compare – Original	12,405	12,405
Neighbor Compare – Print	5,081	1,276
Self-Compare – New	3,480	856
Self-Compare – Original	2,392	2,392
Total	**73,746**	**26,531**

Sums may differ due to rounding.

11.2 Program Description

The Energy Smart Behavioral program ("Behavioral") is intended to use social norming to leverage energy savings; this is a long-known behavioral science tenet that individuals desire to be at a similar or better level than their peers, and thus, the report drives high users to reduce their energy consumption. The offering was implemented by Franklin Energy Services ("Franklin") and administered by APTIM.

The program provides tailored reports to residential customers that include:

- Comparisons of customers' current energy use to their past use;
- Comparison of energy use to similar homes in the area; and
- Tips on how customers can reduce their energy use as well as information on other Energy Smart offerings.

11.3 EM&V Methodology

The impact evaluation approach for this program is as follows:

- The remaining control groups for each treatment group were tested for validity as a statistical match for the treatment households in the baseline year;

- Cohorts in which a valid counterfactual group does not exist were matched to an ad-hoc control group created via propensity score matching;
- Energy savings were estimated via regression modeling;
- Double counted savings were removed; and
- Demand (kW) savings were estimated from the validated energy savings.

Franklin implemented six cohorts since the transfer of the program implementation from Accelerated Innovations to Franklin Energy Services. The following table summarizes the new cohorts implemented during PY13.

TABLE 11-5 FRANKLIN COHORTS

Cohort	Treatment	Control	Intervention Date
Neighbor Compare – ADM	21,384	6,293	March 1, 2021
Neighbor Compare – New	29,004	3,309	October 29, 2020
Neighbor Compare – Original	12,405	12,405	July 10, 2020
Neighbor Compare – Print	5,081	1,276	October 29, 2020
Self-Compare – New	3,480	856	October 29, 2020
Self-Compare – Original	2,392	2,392	July 10, 2020
Total	**73,746**	**26,531**	**N/A**

This led to a total of 73,746 treatment customers for the Behavioral Program. The Evaluators attempted to provide savings estimates for each cohort. All cohorts contained the full 12 months of post-period data to include in the analysis.

11.3.1 DATA PROVIDED

ENO provided the following data to support the analysis:

- Pre-treatment electric billing data for all customers in the Entergy service territory. The data started on December 1, 2016, and ended on December 31, 2022;
- Post-treatment hourly AMI data for all customers in the Entergy service territory. The data started on January 1, 2023, and ended on December 31, 2023;
- Participants that received reports through the 2023 program year;
- Participant and nonparticipant account active and account inactive dates; and,
- Program tracking data for participants, including date of installation and verified kWh savings for each measure installed.

The above data was sufficient for the Evaluators to conduct the evaluation activities summarized in the following sections.

11.3.2 DATA PREPARATION AND CLEANING

Prior to cohort validation and regression analysis, the Evaluators prepared monthly billing data through a series of cleaning steps. First, an average daily usage value was calculated by dividing the monthly usage by the number of billed days in a month. Additionally, data was filtered using the following criteria:

- Customer months that had less than 10 billed days or greater than 90 billed days were excluded from analysis—months that meet these criteria have overlapping bills and are unreliable for analysis.
- Months that were present after a customer's move out date were also excluded from analysis.
- Customer months in which average daily usage exceeded 200 kWh were excluded from analysis.
- Pre-treatment data was limited to the 12 months prior to the treatment start date for each experimental cohort.
- Customers without at least 9 of the 12 months of pre-period data, as well as at least 9 of the 12 months of post-period data was removed from the analysis.

The data provided to ADM was in the form of bi-monthly billing data as well as hourly AMI data. However, after calendarization of the billing data and aggregation of the hourly data, the data was essentially converted to monthly resolution. For the remainder of the report, the Evaluators will reference the billing data as having monthly intervals.

The Evaluators identified high outliers at the threshold of average daily kWh usage over 200 kWh per day. This level of consumption is unrealistic for residential households and can reasonably be categorized as the result of a reading error rather than a valid reading from a high user. The Evaluators aimed to remove error reading rather than remove high and low users, as these subgroups contribute real behaviors to the average savings estimate.

11.3.3VALIDITY TESTING

For reliable estimation of savings effects, it is ideal to have a randomized control trial (RCT). In this experimental design, a group of eligible customers are randomly assigned to treatment or control groups. The offering was originally an RCT design, however, due to changes in program design, the previously defined RCT groups were altered. The Evaluators evaluated the program using Franklin cohorts.

Although this method likely portrays deflated savings, it is the only viable method for providing statistically significant savings. For the Franklin cohorts, the Evaluators verified control group validity. In cases where the control group was not a sufficient match, the Evaluators employed propensity score matching and verified the counterfactual groups with monthly t-tests.

The remaining control groups' alteration was tested for statistically significant differences in usage between the treatment and control groups for each of the 12 pre-period months. The control groups were validated in prior evaluations of this program, however due to treatment and control groups decay, there is a possibility of the groups ceasing to be a statistical match. Validity testing was completed to determine if propensity score matching is required to create an ad-hoc, quasi-experimental control group for any of the cohorts.

The Evaluators estimated savings displayed in the customers that continued treatment through the transfer of implementors. The table below displays the results of the control group validation for each cohort.

TABLE 11-6 PY13 VALIDITY TESTING RESULTS

Cohort	Valid Control Group	PSM
Neighbor Compare – ADM	✓	
Neighbor Compare – New	✓	
Neighbor Compare – Original	✓	
Neighbor Compare – Print	✓	
Self-Compare – New	✓	
Self-Compare – Original		✓

The Evaluators found all neighbor compare groups and the new self compare group retained a statistically valid control group. The original self-compare group did not have a randomly assigned control group. Therefore, the Evaluators employed propensity score matching to create a valid counterfactual group for the self-compare group, as displayed in the table above. These subsets created by the Evaluators passed the validity testing for each month in the pre-period.

11.3.4 PROPENSITY SCORE MATCHING

Regression model analyses are unable to be run on cohorts in which a statistically comparable control group is not defined. Therefore, in order to analyze cohorts that have non-equivalent counterfactual groups, a post-hoc control group is required to be created. The Evaluators created a statistically similar control group using propensity score matching (PSM), a method that allows the Evaluators to find the most similar household based on the customers' billed consumption trends in the pre-period and verified with statistical difference testing. The Evaluators conducted propensity score matching for each cohort in which a valid counterfactual group was not defined or validated.

A propensity score is a metric that summarizes several dimensions of household characteristics into a single metric that can be used to group similar households. To create a post-hoc control group, the Evaluators compiled billing data of all control participants from all waves to compare against treatment households via quasi-experimental methods. This allowed the Evaluators to select from a large group of similar households that have not received home energy reports. With this information, the Evaluators matched the treatment group to a similar control group via seasonal pre-period usage. After matching, a t-test was conducted for each month in the pre-period to help determine the success of PSM.

After creating a PSM control group, the cohort undergoes the same regression modeling as the remaining statistically valid cohorts. The regression specifications and details are summarized in the next section.

11.3.5 LINEAR REGRESSION MODELING

After validating control groups were a sufficient match for each cohort, the Evaluators employed a post-program regression model to evaluate verified savings for the impact evaluation for each cohort.

11.3.5.1 Post-Program Regression Model

The post-program regression (PPR) model combines both cross‐sectional and time series data in a panel dataset. This model uses only the post‐program data, with lagged energy use for the same calendar month of the pre‐program period acting as a control for any small systematic differences between the participant and control customers. In particular, energy use in calendar month t of the post‐program period is framed as a

function of both the participant variable and energy use in the same calendar month of the pre‐program period. The underlying logic is that systematic differences between participants and controls will be reflected in differences in their past energy use, which is highly correlated with their current energy use. The version we estimate includes monthly fixed effects and interacts these monthly fixed effects with the pre‐program energy use variable. These interaction terms allow pre‐program usage to have a different effect on post‐program usage in each calendar month.

The model specification is as follows:

EQUATION 11-1 POST-PROGRAM REGRESSION (PPR) MODEL SPECIFICATION

$$ADC_{it} = \alpha_0 + \beta_1(Treatment)_i + \beta_2\ (PreUsage)_i + \beta_3(Month)_t + \beta_4(Month \times PreUsage)_{it} + \varepsilon_{it}$$

Where,

i = the ith household

t = the first, second, third, etc. month of the post-treatment period

ADC_{it} = Average daily usage for reading t for household i during the post-treatment period

$Treatment_i$ = Dummy variable indicating whether household i was in the treatment or control group

$Month_t$ = Dummy variable indicating month-year of month t

$PreUsage_i$ = Average daily usage across household i's available pre-treatment billing reads

ε_{it} = Customer-level random error

α_0= The model intercept for home i

β_{1-4} = Coefficients determined via regression

The coefficient β_1 represents the average change in consumption between the pre-period and post-period for the treatment group.

In this specification, savings are calculated by:

EQUATION 11-2 MONTHLY SAVINGS ESTIMATE

$$Savings = \sum Treatment\ Coeff \times Number\ of\ recipients\ in\ month\ i \times Number\ of\ days\ in\ month\ i$$

11.3.6REMOVE DOUBLE COUNTED SAVINGS

Participants in both the treatment and control groups participate in other Energy Smart residential energy efficiency programs. The Behavioral Program reports may also increase the customer's propensity to participate in other programs. This additional participation is known as uplift. The reports sent to customers include information about other Energy Smart incentives and programs, which may lead to customers adopting more energy efficient upgrades for their home.

When a household participates in an efficiency program because of this encouragement, the utility might count their savings twice: once in the regression-based estimate of behavioral program savings and again in the

estimate of savings for the other energy efficiency program. Although uplift rarely displays a statistically significant difference between the treatment and control groups, the UMP recommends removing uplift from each group at the household level.

The double counted savings, whether positive or negative, are subtracted from the wave's savings estimates from the regression analysis to get total verified savings. The approach for removal of double counted savings will differ based on whether the other program is a downstream program. The following sections detail our proposed methodology for downstream programs.

Downstream programs traditionally track installed measures at the customer level. Entergy delivered customer-level tracking data for other programs offered to residential customers. The Evaluators evaluated these programs and used the verified savings from each program to use towards downstream double counting for the Behavioral Program. The residential Energy Smart programs included in the double counting analysis are the Heating, Cooling, and Home Comfort Program, the Income-Eligible Multi-Family Program, and the Smart Thermostats Program.

The Evaluators corrected for cross-program participation that occurred after treatment began to the extent that the treatment group participated at a higher rate than the control group. The Evaluators estimated and subtracted savings from program uplift from the total program portfolio savings for each program year. The double count savings were calculated on a per-household level for each treatment group in each cohort as follows.

EQUATION 11-3 DOUBLE COUNT SPECIFICATION

$$Double\ Counting = \left(\frac{OP\ kWh}{Household_{Treatment}} - \frac{OP\ kWh}{Household_{Control}}\right) \times \#\ Accounts_{Treatment}$$

Where,

$\frac{OP\ kWh}{Household_{Treatment}}$ = Other program kWh per household in the treatment group

$\frac{OP\ kWh}{Household_{Control}}$ = Other program kWh per household in the control group

$\#\ Accounts_{Treatment}$ = Total accounts in the treatment group

To estimate double counted program savings from downstream program uplift, the Evaluators:

1. Matched the Behavioral Program treatment and control group customers to the utility energy efficiency program tracking data by customer ID or address;
2. Calculated the savings per treatment group subject from efficiency uplift as the difference between treatment and control groups in average efficiency program savings per subject; and
3. Multiplied that difference by the number of subjects who are in the treatment group.

The Evaluators summarized and removed program uplift for each wave and treatment status for each of the other residential program offerings.

11.4 Evaluation Findings

This section details the level of program activity for 2023, the reported and verified gross savings that resulted from that activity.

The program-level savings are calculated by multiplying the average annual household impact estimate by the weighted number of active program participants in the treatment group and after removing double counted savings, by program year.

The Evaluators calculated the percent savings per home dividing the average annual energy savings estimated in the treatment group by the average annual energy consumption from the control group for each program year. That value is then adjusted for uplift from downstream measures. This methodology is presented in the UMP Chapter 17 Residential Behavior Protocol[10].

11.4.1 DATA PREPARATION AND CLEANING

The Evaluators prepared and cleaned billing data provided by Entergy. The Evaluators employed the following cleaning steps for each cohort:

- Filter for customers currently treated in 2023
- Remove negative bills (no occurrences)
- Remove bills with 0 days duration (less than 0.1% of bills)
- Remove bills from customers in which account billing data does not overlap with intervention date
- Filter for post-period after January 1, 2022 and pre-period for 1 year prior to intervention date
- Remove customers from analysis if intervention date is not similar to median intervention date (within 45 days)
- Remove bills with less than 10 days duration or greater than 90 days duration
- Remove outlier bills (bills with greater than 200 kWh consumed per day) (0.2% occurred)
- Remove bills from customers with insufficient data (less than 9 months pre-period data or less than 9 months post-period data)
- Remove accounts with multiple addresses

After conducting the above cleaning steps, the Evaluators conducted validity testing. The results of validity testing are displayed below.

11.4.2 VALIDITY TESTING

The remaining groups after billing preparation and cleaning were tested for statistically significant differences in usage between the treatment and control groups for each of the 12 pre-period months in each wave. If there was no control group created for the cohort, or if the remaining control group is no longer valid, the Evaluators employed propensity score matching to create an ad-hoc counterfactual group.

[10] https://energy.gov/sites/prod/files/2015/02/f19/UMPChapter17-residential-behavior.pdf

11.4.3 PROPENSITY SCORE MATCHING

The Evaluators created a valid post-hoc control group for the Self Compare – Original group because it was not designed with a valid counterfactual group. Quasi-experimental methods are required when the control group has not been randomly assigned as it would be in a RCT. All other cohorts retained counterfactual group validity as displayed through validity testing in the section above.

The Evaluators created a statistically similar control group using propensity score matching (PSM), a method that allows the Evaluators to find the most similar household based on the customers' billed consumption trends in the pre-period, specifically covariates for average summer, winter, fall, and spring pre-period usage were used and verified with statistical difference testing.

A propensity score is a metric that summarizes several dimensions of household characteristics into a single metric that can be used to group similar households. To create a post-hoc control group, the Evaluators compiled billing data of all control participants from all cohorts to compare against treatment households via quasi-experimental methods. This allowed the Evaluators to select from a large group of similar households that have not received home energy reports. With this information, the Evaluators matched the treatment group to a similar control group on the following variables:

- Pre-period spring usage
- Pre-period summer usage
- Pre-period fall usage
- Pre-period winter usage

After matching, a t-test was conducted for each month in the pre-period to help determine the success of PSM.

The Evaluators employed propensity score matching using the nearest match algorithm at a one-to-one matching ratio for the self-compare groups. The matching ratio defines the number of control customers to be matched to one treatment customer. In addition, the Evaluators allowed replacement of customers, essentially allowing the algorithm to select a control customer for more than one unique treatment customer. The tables provided in Appendix C display the validity of the matched groups before and after propensity score matching.

The following tables provide the results for t-testing, which helps determine the success of matching. The test measures whether there are statistically significant differences in average daily kWh usage between the treatment and control groups in the pre-period by month. Statistically significant differences occur when the P-Value is less than 0.05 at the 95% significance level. As displayed in the table below, the P-Value is much greater than 0.05 for all 12 pre-period months. This result further indicates propensity score matching performed satisfactorily, as there was at maximum one instance for a rejection of the null hypothesis for any of the pre-period months. Therefore, the Evaluators accept this matched group as viable matches for the Self Compare – Original group.

TABLE 11-7 PY13 SELF COMPARE – ORIGINAL VALIDITY TESTING RESULTS

Pre-Period Month	Treatment Group Average Daily Usage (kWh/day)	Control Group Average Daily Usage (kWh/day)	Average Daily Usage Difference (kWh/day)	P-value	Statistically Significant Difference
Oct 2019	56.86	78.38	-21.52	0.0697	*
Nov 2019	41.89	43.61	-1.71	0.3354	-
Dec 2019	41.73	41.37	0.36	0.8111	-
Jan 2020	42.69	42.49	0.20	0.8945	-
Feb 2020	29.80	31.19	-1.39	0.2579	-
Mar 2020	27.14	27.63	-0.48	0.6782	-
Apr 2020	29.63	29.65	-0.02	0.9905	-
May 2020	28.85	29.19	-0.34	0.7768	-
Jun 2020	27.74	27.90	-0.17	0.8944	-
Jul 2020	27.01	27.86	-0.85	0.4319	-
Aug 2020	24.01	23.93	0.09	0.9274	-
Sep 2020	29.35	29.21	0.14	0.9037	-

After propensity score matching for the above cohort, the Evaluators continued with linear regression modeling to evaluate average household savings across the cohorts. The results of the linear regression modeling are summarized in the section below.

11.4.4LINEAR REGRESSION MODELING RESULTS

This section details the regression results of each of the evaluated cohorts. The Initial, Supplemental, and Neighbor Compare groups were evaluated with the remaining RCT groups. The Third group and self-compare groups were evaluated with the matched control group created via propensity score matching.

As discussed in the evaluation approach section, savings are determined through the equation summarized in Equation 11-2. Model output for each cohort is further summarized in Appendix C.

Per-home results and percent savings are presented for each of the analyzed cohorts. Joint savings attributable to Energy Smart downstream programs were calculated and removed to avoid double counting.

The Evaluators found four of the nine cohorts to display statistically significant savings. In addition, the majority of the models displayed ideal fitness, as displayed by adjusted R-squared values of 0.56 and above. The Evaluators summarize the model results for each cohort in the table below.

TABLE 11-8 PY13 REGRESSION MODEL RESULTS BY COHORT

Cohort	Treatment Coefficient	P-Value	Adjusted R-Squared	Statistically Significant Savings
New ADM Cohort	0.25648	0.00011	0.68654	No
Franklin Neighbor Compare - New	-0.42561	0.00000	0.70896	Yes
Franklin Neighbor Compare - Original	0.07409	0.59015	0.60803	No
Franklin Neighbor Compare - Print	-0.73439	0.00000	0.73374	Yes
Franklin Self Compare - New	-0.15545	0.46308	0.71338	No
Franklin Self Compare - Original	-0.75298	0.00135	0.56071	Yes

The regression output displays statistically significant savings if the treatment coefficient is negative and if the p-value for the treatment coefficient is less than 0.05. As displayed, the following three cohorts meet these requirements: Neighbor Compare – New, Neighbor Compare – Print, and Self Compare – Original. These cohorts are the same cohorts that displayed statistically significant savings in the PY13 evaluation.

The ADM cohort, Neighbor Compare – Original, and Self Compare – New group do not demonstrate energy consumption differences between the treatment group and the control group, as demonstrated by the p-value above 0.05 and/or positive treatment coefficient. This means that the null hypothesis that the treatment group and control group are similar cannot be rejected. Thus, the Evaluators are unable to verify savings for these cohorts through the Behavioral Program.

The treatment coefficients for cohorts in which statistically significant savings were displayed were multiplied by the total number of days in the evaluation period (365.25 days for all cohorts). The following table summarizes the average annual household savings and percent annual household savings for each cohort that displayed statistically significant savings, prior to double counting analysis adjustments.

TABLE 11-9 PY13 HOUSEHOLD-LEVEL UNADJUSTED SAVINGS BY COHORT

Cohort	Unadjusted Household Savings	Average Annual Household Usage	Percent Annual Household Unadjusted Savings
Neighbor Compare – ADM	0	11,570	0.00%
Neighbor Compare – New	155	16,185	0.96%
Neighbor Compare – Original	0	13,220	0.00%
Neighbor Compare – Print	268	13,815	1.94%
Self-Compare – New	0	14,731	0.00%
Self-Compare – Original	275	9,894	2.78%

The average household savings for each cohort were then extrapolated to the total number of customers treated in PY13, weighted by number of days during the evaluation period. The following table summarizes the program-level savings resulting from regression model analysis, prior to double counting adjustments.

TABLE 11-10 PY13 PROGRAM-LEVEL UNADJUSTED SAVINGS BY COHORT

Cohort	Unadjusted Household Savings	Weighted Number of Customers in PY13	Unadjusted PY13 kWh Savings
Neighbor Compare – ADM	0	21,384	0
Neighbor Compare – New	155	29,004	4,508,815
Neighbor Compare – Original	0	12,405	0
Neighbor Compare – Print	268	5,081	1,362,866
Self-Compare – New	0	3,480	0
Self-Compare – Original	275	2,392	657,789
Total	**-**	**73,746**	**6,529,470**

The program displays a total of 6,529,470 kWh verified savings across 73,746 customers in PY13. Three of the six cohorts demonstrated statistically significant, positive energy savings. The Evaluators were able to verify savings for 49% of the treated households in PY13. The remaining cohorts were unable to provide valid energy savings demonstrated through monthly energy consumption.

11.4.5 DOUBLE COUNTED SAVINGS RESULTS

Participants in both the treatment and control groups participate in other energy efficiency programs. The double counted savings, defined in the methodology, whether positive or negative, are subtracted from the cohort's gross savings estimates from the regression analysis to get total verified savings. This section summarizes the results of the double counting analysis for downstream programs.

ENO delivered tracking data for the following programs:

- IQW Program
- A/C Solutions
- HPwES Program
- RLA Program
- MF Solutions Program

The Evaluators identified and summarized the average treatment customer, average control customer, and average incremental savings attributed to the above residential programs for each cohort. The table below summarizes the double counting savings to be subtracted from each cohort's annual program savings. The double counted savings are not applicable for cohorts in which no verified savings could be estimated.

TABLE 11-11 PY13 DOUBLE COUNTED SAVINGS BY COHORT

Cohort	Treatment Savings per Household (kWh per Household)	Control Savings per Household (kWh per Household)	Double Counted Savings per Household (kWh per Household)	Total Double Counted Savings (kWh)
Neighbor Compare – ADM	71.71	61.67	10.05	0
Neighbor Compare – New	95.81	97.04	-1.23	-35,564
Neighbor Compare – Original	104.76	91.99	12.78	0
Neighbor Compare – Print	69.37	64.17	5.20	26,427
Self-Compare – New	79.80	75.32	4.48	0
Self-Compare – Original	66.32	36.09	30.23	72,313
Total	**87.17**	**73.37**	**13.80**	**63,176**

The results are separated by cohort. PY13 displays a total of 63,176 kWh in double counted savings. The double counted savings represented in the table above are removed from each cohort's regression model savings estimate. The adjusted household-level savings for each cohort are summarized in the tables below.

TABLE 11-12 PY13 HOUSEHOLD-LEVEL ADJUSTED SAVINGS BY COHORT

Cohort	Unadjusted Household Savings	Household Double Counted Savings	Adjusted Household Savings	% Change to Savings
Neighbor Compare – ADM	0	10	0	-
Neighbor Compare – New	155	-1	157	-0.79%
Neighbor Compare – Original	0	13	0	-
Neighbor Compare – Print	268	5	263	1.94%
Self-Compare – New	0	4	0	-
Self-Compare – Original	275	30	245	10.99%

After conducting double counting adjustments, the Evaluators extrapolated household-level adjusted savings to estimate total annual energy savings for PY13 for each cohort. The total verified and adjusted program-level savings are displayed in the table below.

TABLE 11-13 PY13 PROGRAM-LEVEL ADJUSTED SAVINGS BY COHORT

Cohort	Adjusted Household Savings (kWh per Household)	Average Annual Household Usage (kWh per year)	Percent Annual Household Adjusted Savings	Weighted Number of Customers in PY13
Neighbor Compare – ADM	0	11,570	0.00%	21,384
Neighbor Compare – New	157	16,185	0.97%	29,004
Neighbor Compare – Original	0	13,220	0.00%	12,405
Neighbor Compare – Print	263	13,815	1.90%	5,081
Self-Compare – New	0	14,731	0.00%	3,480
Self-Compare – Original	245	9,894	2.47%	2,392
Total	**88**	**13,912**	**0.63%**	**73,746**

11.4.6DEMAND REDUCTION RESULTS

The Evaluators estimated demand reduction by dividing the annual energy savings by integrating hourly load factors with monthly estimated energy savings for each group for both the annual program year and the extended program year.

The Evaluators conducted the steps presented in the demand calculation methodology subsection. The following table displays the resulting demand savings for each group in which statistically significant energy savings was estimated.

TABLE 11-14 PY13 PROGRAM-LEVEL DEMAND REDUCTIONS BY COHORT

Cohort	Adjusted PY13 kW Savings
Neighbor Compare – ADM	0.00
Neighbor Compare – New	766.82
Neighbor Compare – Original	0.00
Neighbor Compare – Print	225.51
Self-Compare – New	0.00
Self-Compare – Original	98.79
Total	**1,091.12**

The Behavioral Program displayed 1,091.12 kW reductions in PY13 resulting from energy savings demonstrated by Neighbor Compare – New, Neighbor Compare – Print, and Self Compare – Original cohorts.

11.4.7VERIFIED SAVINGS

The table below summarizes the verified gross and net energy savings. The Behavioral Program NTG ratio is 100% due to the nature of the program. Overall verified gross and net savings were 6,466,294 kWh and 1,091.12 kW between January 1, 2023 and December 31, 2023.

TABLE 11-15 PY13 BEHAVIORAL VERIFIED ENERGY AND DEMAND REDUCTIONS BY COHORT

Cohort	Weighted Number of Customers in PY13	Verified PY13 kWh Savings	Verified PY13 kW Savings	Percent Annual Household Adjusted Savings
Neighbor Compare – ADM	21,384	0	0.00	0.00%
Neighbor Compare – New	29,004	4,544,379	766.82	0.97%
Neighbor Compare – Original	12,405	0	0.00	0.00%
Neighbor Compare – Print	5,081	1,336,439	225.51	1.90%
Self-Compare – New	3,480	0	0.00	0.00%
Self-Compare – Original	2,392	585,476	98.79	2.47%
Total	**73,746**	**6,466,294**	**1,091.12**	**0.63%**

Three of the six groups displayed statistically significant, positive savings. The Neighbor Compare – New, and Neighbor Compare – Original, and Self Compare – Original groups display an average household annual savings of 0.97%, 1.91%, 2.47% respectively. The Neighbor Compare – Original and Self Compare – Original groups effectively doubled their annual household energy savings between PY13 and PY13.

The Evaluators would like to emphasize that the Behavioral Program PY13 results are atypical due to disruption of randomized control trial cohort assignment and reduced mailed and emailed reports to customers due to data disruptions. For future program years and program planning, the Evaluators estimate a range between 0.5% and 2.5% annual household savings would better align with typical year savings.

The Evaluators also note that in December 2023, the program implementers designed one aggregate behavioral cohort with RCT design. This treatment and control group design was validated by the evaluation team. The Evaluators therefore plan to evaluate the program without quasi-experimental evaluation techniques in PY14, leading to more accurate and defensible savings in the future.

by Neighbor Compare – New, Neighbor Compare – Print, and Self Compare – Original cohorts.

11.4.8DEMAND REDUCTION

The relationship between annual usage savings and peak demand savings has not been defined for HURs. Program savings rely on monthly meter reading data provided by AI. At this time, smart meter data (hourly usage data) are not yet available for the majority of Entergy residential customers. Thus, the resolution of billing data provided for analysis is unsuitable for the direct evaluation of peak demand savings. It can be assumed that total monthly usage can be attributed to the usage of other residential components (e.g., HVAC, lighting, etc.) and that any reduction in usage is proportional to the overall usage of these components. Load factors are available for these components at an hourly resolution; thus, the Evaluators have developed a model for predicting coincident peak demand savings from component load factors from the gross energy savings calculated using the methodology defined below.

11.4.8.1 Normalize kWh Usage

To increase the generalizability of the model, the Evaluators will first normalize the kWh savings value predicted by the impact evaluation regression model into a percent savings value by dividing each month's savings by the total annual savings, as represented in the equation below.

EQUATION 11-4 MONTHLY SAVINGS NORMALIZATION CALCULATION

$$\%\ Savings\frac{month}{year} = {kWh\ savings_m}\Big/{kWh\ savings_y}$$

Where,

M = Value for given program month m.

Y = Value for given program year y.

11.4.8.2 Calculate Monthly Load Factors

The model assumes a linear relationship between the component variables and the percentage savings calculated above. Because load shape information is available for residential components at an hourly resolution, the Evaluators can estimate the relationship between component load and percent savings to estimate total demand savings. To make sure that the model is interpretable, hourly load factors must be converted to monthly load factors. The Evaluators sourced hourly load data from the U.S. Department of Energy

Open Data Catalog of residential hourly load profiles. The database contains hourly load profiles for all TMY3 locations in the United States. The specific location chosen for this evaluation was the New Orleans International Airport.

11.4.8.3 Simple Regression

In order to determine the relationship between the percent savings and the component load factors, the Evaluators ran a simple linear regression. Because the model is used to predict savings from known variables, we hold the intercept constant at 0 to ensure that the majority of the variability will be explained by the component load factors. The following equation displays an example regression equation used to predict percent savings attributable to a higher resolution time period.

EQUATION 11-5 PERCENT SAVINGS PREDICTION

$$\%\ Savings\frac{month}{year} = \beta_1 lf_{Total\ kWh}$$

Where,

Lf = Load factor for each component variable of interest

Total kWh = All end-uses combined

The regression coefficients for the above regression equation represent the relationship of each of the component variables to percent savings. Because both independent and dependent variables are calculated in units of months, the numerator of the regression weights are time invariant and can be used to estimate the percentage of savings across any unit of time of interest in a year.

11.4.8.4 Demand Calculation

Coincidence peak load was estimated for the total electric load by summing the total electric load over peak hours as defined by the TRM—non-weekend and non-holiday days between 4:00 p.m. and 5:00 p.m. for the months of June through August. The following equation illustrates the calculation for calculating the peak load factor.

EQUATION 11-6 PEAK LOAD FACTOR CALCULATION

$$Peak\ load\ factor_x = \sum_{i=1}^{n} Hourly\ load\ factor_x$$

Where,

X = Component variable of interest (Total electric load)

I = First peak hour for the entire annual peak period

N = Last peak hour for the entire annual peak period

This will generate the percent of annual savings that took place in the total peak period. The equation below demonstrates this calculation.

EQUATION 11-7 PERCENT SAVINGS ATTRIBUTABLE TO PEAK PERIOD

$$\%\ Savings\frac{peak}{year} = \beta_x \cdot Peak\ load\ factor_x$$

Multiplying this value by the total annual savings will then generate the kWh savings that took place during the peak period, as illustrated by the equation below.

EQUATION 11-8 ENERGY SAVINGS DURING PEAK PERIOD

$$Peak\ kWh\ savings = Total\ kWh\ savings\ \cdot \%\ savings\frac{peak}{year}$$

Dividing this value by the total number of peak hours will generate coincident peak demand savings in units of kW, as shown in Appendix C: Behavioral Program Model Output.

EQUATION 11-9 PEAK DEMAND SAVINGS

$$Peak\ kW\ savings = \frac{Peak\ kWh\ savings}{Anual\ Peak\ Period} \cdot \frac{Annual\ Peak\ Period}{Number\ of\ peak\ hours}$$

As with gross usage savings, the Evaluators anticipates that some participants in the treatment group will also participate in other Entergy programs. The adjusted savings per month is an input for the demand savings estimation with this method. The Evaluators adjust the savings per month by weighing the HVAC measures by degree day.

11.5 Findings & Recommendations

Findings are as follows:

- Estimated Behavioral Program Savings: The Evaluators conducted billing analysis of cohorts to estimate Behavioral Program savings for Entergy. In the 2023 calendar year evaluation, statistically significant annual savings were found for three out of six cohorts. The verified program savings for PY13 amounted to 6,466,294 kWh and verified demand reductions of 1,091.12 kW.
- Regression Analysis Results: Unadjusted program savings for PY13 totaled 6,529,470 kWh. Downstream double counted savings were estimated at 63,176 kWh for PY13. After removing these double counted savings from the regression results, the total verified, adjusted program savings amounted to 6,466,294 kWh.
- Comparison of Household Annual Savings: The Neighbor Compare – New, Neighbor Compare – Original, and Self Compare – Original groups demonstrated average household annual savings of 0.97%, 1.91%, and 2.47%, respectively. Notably, the Neighbor Compare – Original and Self Compare – Original groups effectively doubled their annual household energy savings between PY13 and PY13. However, three cohorts in the program did not exhibit statistically significant savings, resulting in lower than typical behavioral program savings.
- Factors Contributing to Deflated Savings: Deflated savings were observed due to changes in implementation, including the treatment of 75% of the control group and data disruptions in customer emails, which hindered implementors from sending reports to many customers. These disruptions potentially decreased the treatment effect during the 2023 evaluation year.

- Challenges in Estimating Savings for Certain Cohorts: The Evaluators were unable to estimate savings for the Neighbor Compare – ADM, Neighbor Compare – Original, and Self Compare – New cohorts. Although ad-hoc counterfactual groups passed validity testing, regression results showed zero or negative average household savings, indicating inherent differences between treatment and control groups. The Evaluators recommend future cohorts align with RCT designs and are randomly selected by a third-party evaluator.

- Atypical Results for PY13: The PY13 results are deemed atypical due to disruption of randomized control trial cohort assignment and reduced mailed and emailed reports to customers because of data disruptions. For future program years and planning, annual household savings in the range of 0.5% to 2.5% are anticipated to better align with typical year savings.
- Transition to Aggregate Behavioral Cohort with RCT Design: In December 2023, program implementers designed an aggregate behavioral cohort with an RCT design, validated by the evaluation team. Consequently, the Evaluators plan to evaluate the program without quasi-experimental evaluation techniques in PY14, aiming for more accurate and defensible savings in the future.

Recommendations are as follows:

- Halting Treatment of Control Group Customers: The Evaluators suggest that implementors maintain the practice of ceasing treatment of all control group customers. This approach facilitates the utilization of Randomized Controlled Trial (RCT) designs established at the program's outset. These designs, aligned with the NREL Behavioral Protocol, enable the Evaluators to estimate verified savings accurately.
- Consulting Third-Party Evaluators for Cohort Selection: It is recommended that implementors continue to seek guidance from third-party evaluators when selecting future cohorts. Moreover, the Evaluators advocate for aligning all future cohorts with the NREL Behavioral Protocol RCT experimental design. Each cohort should ideally comprise a minimum of 25,000 treatment customers to ensure detectable treatment effects. This approach minimizes the need for propensity score matching and ensures equivalence between treatment and control groups, facilitating accurate measurement of treatment effects during the post-period.
- Consulting Third-Party Evaluators for Program Changes: The Evaluators advise implementors to consult third-party evaluators before implementing any alterations to program or messaging design or frequency. This consultation process ensures that modifications in program design do not significantly impact expected program savings, maintaining program effectiveness and integrity.

12 EASYCOOL BRING YOUR OWN THERMOSTAT

12.1 Summary

The tables below report *ex ante* gross, *ex post* gross, *ex post* net energy savings (kWh) (both annual and lifetime), demand reductions (kW), participation, incentive spend, and *ex post* net NEBs, by measure, where applicable.

TABLE 12-1 PY13 EASYCOOL BYOT ENERGY SAVINGS (KWH)

Measure	*Ex ante* Gross Savings (kWh)	Realization Rate (kWh)	*Ex post* Gross Savings (kWh)	NTG	*Ex post* Net Savings (kWh)
DR Participation: BYOT-only	0	N/A	0	N/A	0
DR Participation: PTR-BYOT	0	N/A	0	N/A	0
Total	**0**	**N/A**	**0**	**N/A**	**0**

Sums may differ due to rounding.

TABLE 12-2 PY13 EASYCOOL BYOT DEMAND REDUCTIONS (KW)

Measure	*Ex ante* Gross Demand (kW)	Realization Rate (kW)	*Ex post* Gross Demand (kW)	NTG	*Ex post* Net Demand Reductions (kW)
DR Participation: BYOT-only	4,750.62	74%	3,530.06	100%	3,530.06
DR Participation: PTR-BYOT	596.17	76%	454.02	100%	454.02
Total	**5,346.79**	**75%**	**3,984.08**	**100%**	**3,984.08**

Sums may differ due to rounding.

TABLE 12-3 PY13 EASYCOOL BYOT LIFETIME SAVINGS SUMMARY

Measure	EUL	*Ex post* Gross Lifetime Energy Savings (kWh)	*Ex post* Net Lifetime Energy Savings (kWh)
DR Participation: BYOT-only	1	0	0
DR Participation: PTR-BYOT	1	0	0
Total	**1**	**0**	**0**

Sums may differ due to rounding.

TABLE 12-4 PY13 EASYCOOL BYOT PARTICIPATION AND INCENTIVE SUMMARY

Measure	Participation (Count of Measures)	Incentive Spend ($)
DR Participation: BYOT-only	4,221	$204,986
DR Participation: PTR-BYOT	530	$25,739
Total	**4,751**	**$230,725**

Sums may differ due to rounding.

TABLE 12-5 PY13 EASYCOOL BYOT NEB SUMMARY

Measure	*Ex post* Net ARCs ($)	*Ex post* Net Water Savings (gallons)	*Ex post* Net Avoided Arrearages
DR Participation: BYOT-only	$0	0	$0
DR Participation: PTR-BYOT	$0	0	$0
Total	**$0**	**0**	**$0**

Sums may differ due to rounding.

12.2 Program Description

The EasyCool Bring Your Own Thermostat (EasyCool BYOT) offering uses a Distributed Energy Resource Management System (DERMS) to enroll, monitor, and to schedule load control events to reduce electricity consumption during periods of high demand. The DERMS system increases the temperature setting by a small amount on customer thermostats. These events may occur between June 1st and September 30th and are limited to a maximum of 15 adjustments per year. The events involve thermostats being adjusted an extra three degrees. These events typically last no more than four hours and occur between noon and 8 p.m. To manage customer comfort, the system will pre-cool the home in advance of the event.

Program participants receive pre-event notifications about half an hour before the scheduled event via the thermostat itself or the thermostat application. Information is also posted on the Energy Smart website. Customers do not need to do anything to participate in an event, rather smart thermostats are adjusted remotely. Customers can opt out of events through a system override. Typically events last two to four hours and result. All events are preceded by a half-hour precool event.

The EasyCool Residential “bring your own thermostat” (BYOT) program targets residential customers interested in participating demand respond events via their smart thermostat. Although the program had originally included small business customers as well, there was low participation among this sector, so staff refocused efforts on residential customers.

The offering works with a wide range of thermostats including those manufactured by ecobee, Honeywell, Nest, Alarm.com, and Emerson. A complete list of qualifying thermostats is published on the program website.

Customers enroll in the offering by visiting a web-based portal. To qualify customers must be a residential ENO customer, have an internet connected thermostat that controls central air conditioning, and agree to the terms and conditions.

Customers enroll in the program via their smart thermostat app or the EasyCool website. They receive a $50 enrollment incentive per device and $25 per device for each event they participate in; last year these incentive

amounts were switched with customers receiving a $25 enrollment incentive and $50 event participation incentive. Customers who remain enrolled year after year receive a $25 continued enrollment incentive. Customers may unenroll by sending an email communication or they may opt-out of events using the web portal.

The program was first introduced in PY10.

12.2.1 PROGRAM CHANGES

In previous program years, customers received a $25 incentive for enrolling and $40 for each year they participated in the offering, with new enrollments receiving both the enrollment and participation incentives. In PY13, the incentive amount was increased to $50 per device enrolled and new enrollments do not receive a participation incentive.

12.2.2 TIMING OF PROJECTS

All projects occurred from May to September.

12.2.3 TRADE ALLIES

There were no reported trade allies in this program.

12.2.4 GOAL ACHIEVEMENT

The table below summarizes the programs' performance against goal.

TABLE 12-6 EASYCOOL BYOT PERFORMANCE TOWARDS GOAL

Ex Post Gross Energy Savings (kWh) Goal	% to kWh Goal	Ex Post Gross Savings (kW) Target	% to kW Target
NA	NA	9,600.00	42%

12.3 EM&V Methodology

The Evaluators employed the following approach to complete impact evaluation activities for the program. The Evaluator followed the Calculated Baseline approach outlined in the Midcontinent Independent System Operator, Inc. (MISO) Business Practices Manual (BPM)[11]. The following impact evaluation steps were taken to determine the suitability of the MISO Calculated Baseline approach:

- Developed an Unadjusted Consumption (UC) Baseline, a Symmetric Multiplicative Adjustment (SMA) Baseline, and a Weather Sensitive Adjustment (WSA) Baseline for each program participant. Loads were calculated utilizing 1-hour AMI data.
- Determined days that will serve as proxy days for testing the suitability of the baseline approach. Proxy days represent days like demand response event days in terms of load shape and temperature profiles.
- Estimated bias (uncertainty) and error on proxy days for each model to assess baseline performance. Bias is assessed by examining the average percent error of the baseline predictions relative to the actual

[11] *Ibid.*

usage on proxy days. In a similar manner, error is assessed through various metrics such as Root Mean Squared Error (RRMSE) using baseline predictions and actual usage on proxy days.

- Selected the baseline model with the lowest absolute bias.

12.3.1GROSS IMPACT METHODOLOGIES

In the evaluation of demand response programs, energy savings are estimated by comparing a participant's load shape during a demand response event with a baseline load shape. This baseline load is assumed to be a good estimate of the counterfactual load—that is, the load that would have manifested had there not been an event called that day.

12.3.1.1 Data Sources

Data used for this evaluation include program tracking data that identifies which customers participated in the program and contains data fields such as hourly usage, hourly interval meter data (AMI) for each customer participating in the program, and a full schedule of DR program events, including the time of the event.

12.3.1.2 MISO Calculated Baseline Approach (Customer Baselines)

The following details the general requirements for the MISO Calculated Baseline Approach. The Evaluators developed Customer Baselines (CBLs) in accordance with this approach. For a demand resource, the Consumption Baseline is a profile of hourly demand based on an averaged sample of historical data which may be adjusted for factors that reflect specific, on-the-day conditions, such as temperature.

The default consumption baseline is designed as follows:

- Separate hourly demand profiles for non-holiday weekdays and for weekends/holidays
- The "weekday" hourly profile is based on the average of the ten (10), but not less than five (5), most recent weekdays that are not holidays or other non-standard "event" days
- The "weekend/holiday" hourly profile is based on the average of the four (4), but not less than two (2), most recent weekend days or holidays that are not "event" days
- An "event" day is one during which there was, for the resource in question, a real- time energy or ancillary services dispatch, or a scheduled outage
- The maximum look-back window is limited to 45 days
- If the 45-day window contains insufficient days to meet the minimum number of days described above, the profiles are constructed based on the available days within the 45-day window that qualify, supplemented by the largest (MW) matching "event" day(s) values for that resource within that same window as necessary to obtain the minimum number of values.

Adjustment mechanisms to the default Consumption Baseline include:

- Symmetric Multiplicative Adjustment (SMA)
    - Adjusts each baseline hourly value (MW) during the event up or down by the ratio of
    - (a) the sum of hourly demands for the three hours beginning four hours prior to the event and (b) the sum of those same three hourly baseline demands
    - The adjustment is limited to a change in any individual baseline hour of plus or minus 20 percent.

- If multiple events occur during the same day, the SMA is calculated only for the first event, but applied to all events that day.

- Weather Sensitive Adjustment (WSA)
  - Adjusts each baseline hourly value (MW) up or down by a Weather Adjustment Factor
  - The Weather Adjustment Factor is determined by a mathematical relationship derived through a regression analysis that considers the DRR load and historical hourly temperature data.

12.3.1.3 Evaluators MISO Models

The following CBL models were developed for each customer in accordance with MISO protocols.

For a 5-of-10 (or 5-of-5) unadjusted baseline, the Evaluators examine the load data from the most recent ten (or five) non-event, non-holiday weekdays relative to the event day and calculate the mean demand usage values of the five highest load days. This baseline is then adjusted for the SMA and WSA models utilizing the method described in Section ***Error! Reference source not found.***.

TABLE 12-7 EVALUATORS' MISO CBL MODELS

Model Type	Baseline Days	SMA	WSA
Unadjusted	5-of-10	No	No
SMA-Adjusted	5-of-10	Yes	No
WSA-Adjusted	5-of-10	No	Yes
Unadjusted	5-of-5	No	No
SMA-Adjusted	5-of-5	Yes	No
WSA-Adjusted	5-of-5	No	Yes

12.3.1.4 Baseline and Proxy Day Development

The Evaluators defined proxy days as the top eight non-event, non-holiday, non-weekend days with the highest loads across all summer months. In addition, proxy days must display a maximum temperature of greater than or equal to the minimum temperature observed during normal curtailment hours during the events. The Evaluators used these defined proxy days to determine the ability of CBL models to predict actual usage for each customer.

12.3.1.5 Cross Program Participation Adjustments

Customers who participate in multiple demand response programs will have double counted savings if the savings estimates are not adjusted in each program where cross participation occurs. For some DR programs, the source of curtailment for the respective DR programs is independent, such as for the Battery Energy Storage System (BESS) Pilot program and the BYOT program (battery storage versus smart thermostat). When the curtailment source is independent between two DR programs, cross participants for the two programs are removed during the impact estimation. The per unit or per account savings reductions are then extrapolated to the full population. For example, removing customers with dual enrollment in BYOT and BESS ensures that the BYOT-only savings estimates does not include impacts from the BESS program. For PY13, this method was preferred for some DR programs with cross participation because the size of the cross-participant sub cohort would have been too small to estimate savings accurately (e.g., only 5 participants were found in BYOT and BESS).

For other DR programs, the curtailment source driving the demand response impact overlaps, such as for BYOT and PTR, where both programs may both involve curtailment of cooling loads. In this case, a savings estimate was developed for participants with and without cross participation. The savings for those with cross participation was adjusted using the savings for those without cross participation in the respective programs, according to the following equation:

$$Cross\ Participant\ kW\ Reduction\ for\ BYOT\ Program\ (PTR - BYOT\ Cohort) = Average\ kW\ Reduction\ (PTR - BYOT) * ((Average\ kW\ Reduction\ (BYOT - only))/ (Average\ kW\ Reduction(BYOT - only) + Average\ kW\ Reduction\ (PTR - only))$$

Where:

$Average\ kW\ Reduction\ (PTR - BYOT)$ = Average estimated kW reduction for participants in both PTR and BYOT.

$Average\ kW\ Reduction\ (BYOT - only))$ = Average estimated kW reduction for participants in BYOT only.

$Average\ kW\ Reduction\ (PTR - only))$ = Average estimated kW reduction for participants in PTR only.

The adjustment for the PTR-BYOT cross participant savings estimate reflects the percentage share of the BYOT-only savings estimate out of the total savings for BYOT-only and PTR-only combined. A separate adjustment following similar logic occurs in the PTR program to remove overlapping savings between BYOT and PTR cross participants.

12.3.1.6 Cohort Creation

The Evaluators created the following measure cohorts for the BYOT program in PY13. Participants without AMI data during DR events (approximately 15% of participants) were considered to have inactive accounts and were excluded from the extrapolation of estimated savings.

TABLE 12-8 BYOT MEASURES

Measure (Cohort)	Total Number of Accounts in Participant Data	Number of Accounts with AMI Data
DR Participation: BYOT-only	4,976	4,221
DR Participation: PTR-BYOT	624	530
Total	**5,600**	**4,751**

12.3.1.7 Savings Calculations and Extrapolation

The Evaluators estimated the Average kW Savings per Event per Participant using participants with complete AMI data during all events. The estimate is extrapolated and weighted based on the number of participants with AMI data on each demand response event date.

The Average kW Savings per Event per Participant is the average kW reduction for each participant across all demand response events in the season, as shown in the equations below.

$$Average\ kW\ Savings\ per\ Event\ per\ Participant = (\sum_{i=1}^{n} Average\ kW\ Reduction\ per\ Event_i)\ /n$$

$$Average\ kW\ Reduction\ per\ Event_i = (\sum_{h=1}^{hours} (Baseline\ kW_{ih} - Actual\ kW_{ih}))/hours$$

Where,

i = an indicator for participant *i*;

h = indicator for event hour *h;*

n = Total number of participants;

hours = total number of event hours;

$Baseline\ kW_{ih}$ = Baseline kW for participant *i* during event hour *h*.

$Actual\ kW_{ih}$ = Actual kW for participant *i* during event hour *h*.

The Evaluators also calculated the Average kW Savings per Event per Device as shown in the following equation:

$$Average\ kW\ Savings\ per\ Event\ per\ Device = Average\ kW\ Savings\ per\ Event\ per\ Participant * (\frac{Number\ of\ Devices}{Number\ of\ Participants})$$

12.3.2NET IMPACT METHODOLOGIES

In demand response programs, it is typically assumed that there are neither spillover nor free-ridership effects (customers are not expected to curtail without participating). Although customers can find workarounds to make up for lost productivity due to demand response events, they are compensated only if they reduce their load during the peak demand window, the primary program goal. As such, the net-to-gross ratio for this program is assumed to be 100%.

12.4 Evaluation Findings

The Evaluators determined that 11% of BYOT participants were also enrolled in the Peak Time Rebate (PTR) Pilot program; therefore, savings were adjusted for cross participation. Savings for cross participants were adjusted to avoid double counting impacts across the two DR programs. The method of adjusting savings for cross participation is detailed in the Gross Impact Methodologies section.

The Evaluators defined two measure types for the BYOT program: 1) BYOT-only, representing participants that are only enrolled in the BYOT program, and 2) PTR-BYOT, representing BYOT participants that are dual enrolled in the PTR program.

Two small DR Pilots ran concurrently with BYOT in PY13, the Battery Energy Storage Solutions (BESS) Pilot and the Electric Vehicle (EV) Charging Pilot, and both showed some cross participation with BYOT. The Evaluators

removed cross participants with the BESS Pilot when estimating savings for BYOT because the load reductions for the two programs are independent[12]. For the BESS program, the load reductions are driven by the battery system, while for the BYOT program, the load reductions are driven by the cooling system. Cross participants from the BESS Pilot that were removed when estimating BYOT impacts are assigned savings from the BYOT program when savings impacts are extrapolated. For the EV Charging Pilot, there are no demand response events for the program and the Evaluators estimated peak demand impacts for the EV Charging Pilot utilizing days when no demand response events were called. In addition, for BYOT and EV Pilot cross participants, the BYOT baselines incorporate any impacts from the EV Pilot so there is no need to adjust either program for cross participation.

TABLE 12-9 EVENT DATES AND TIMES

Event Dates	Event Times (CDT)
6/13/2023	4:00-7:00
6/15/2023	4:00-7:00
6/29/2023	3:00-6:30
7/18/2023	4:00-7:00
7/21/2023	4:00-6:00
8/1/2023	3:00-6:00
8/4/2023	3:00-6:00
8/8/2023	4:00-7:00
8/10/2023	3:00-6:00
8/11/2023	4:00-7:00
8/15/2023	4:00-6:00
8/23/2023	3:30-6:00

12.4.1 LOAD SHAPES AND MODEL PERFORMANCE

The figures below are average load shapes for each subgroup on proxy and event days and depict actual kW and baseline kW for the selected baseline model. The figures show that baseline kW is a good match for actual kW during the hours of curtailment on most proxy days.

[12] Five BYOT participants were dual enrolled with the BESS Pilot.

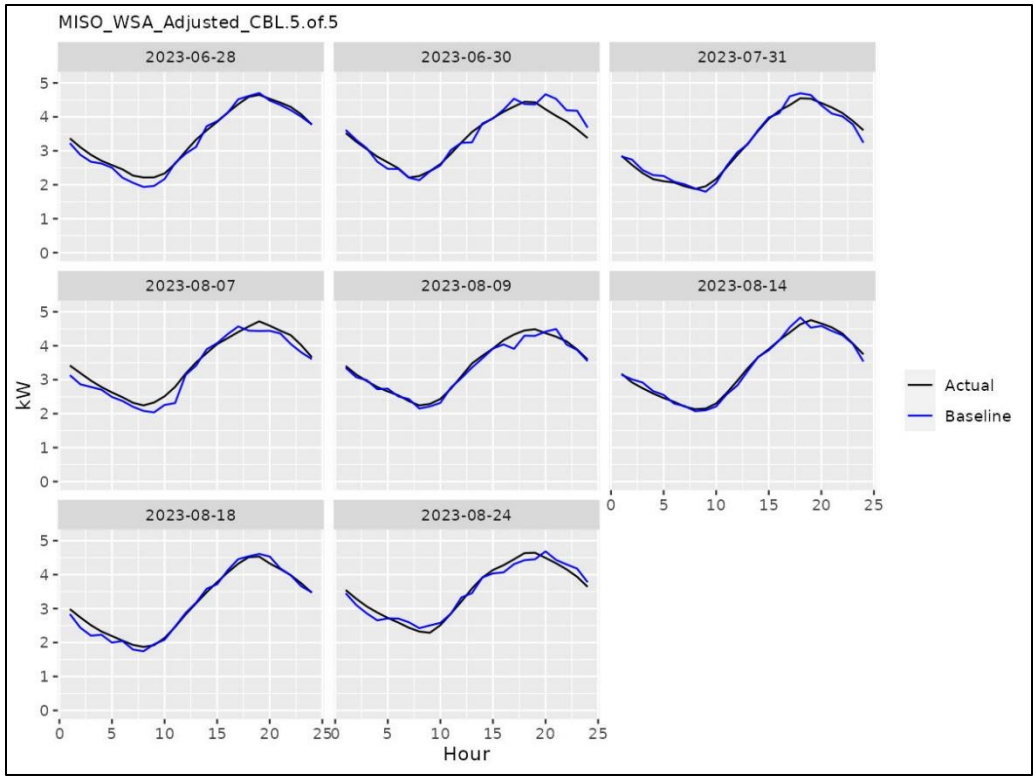


FIGURE 12-1 EASYCOOL BYOT PROXY DAY LOAD SHAPES, BYOT-ONLY

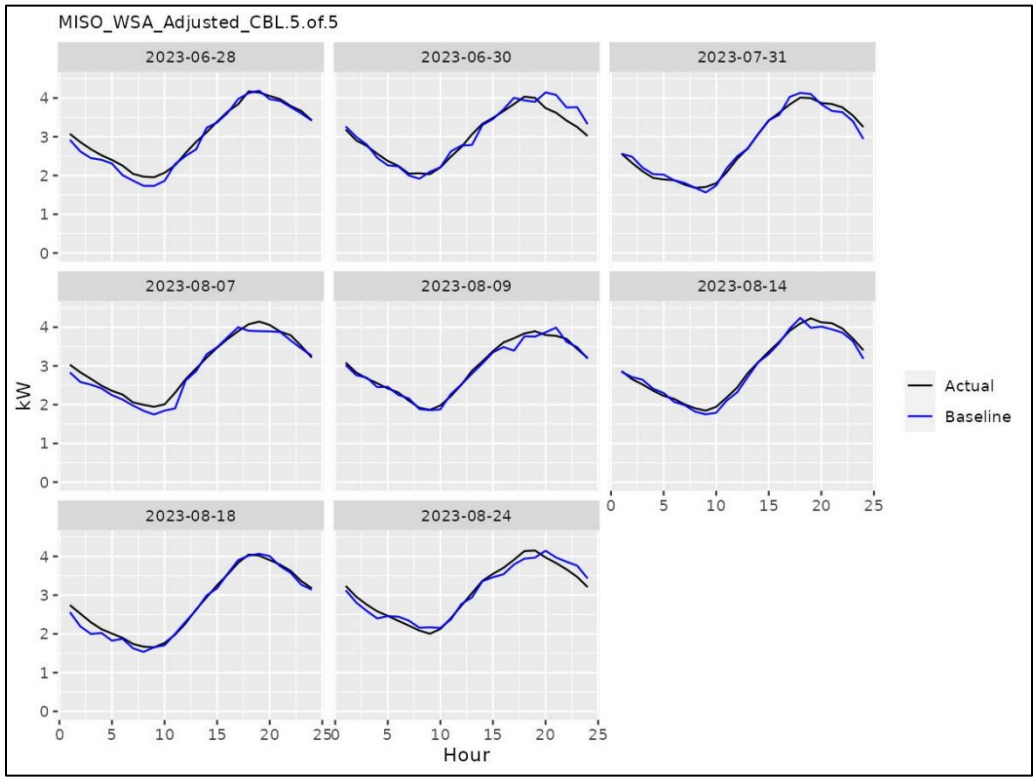


FIGURE 12-2 EASYCOOL BYOT PROXY DAY LOAD SHAPES, PTR-BYOT CROSS PARTICIPANTS

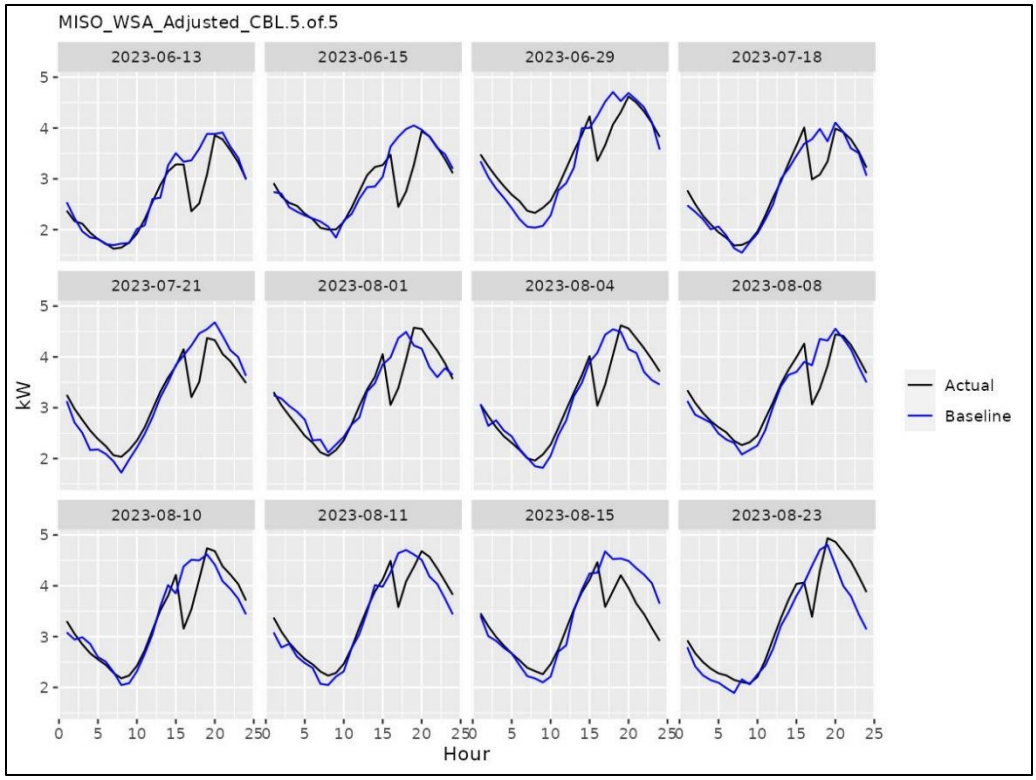


FIGURE 12-3 EASYCOOL BYOT EVENT DAY LOAD SHAPES, BYOT-ONLY

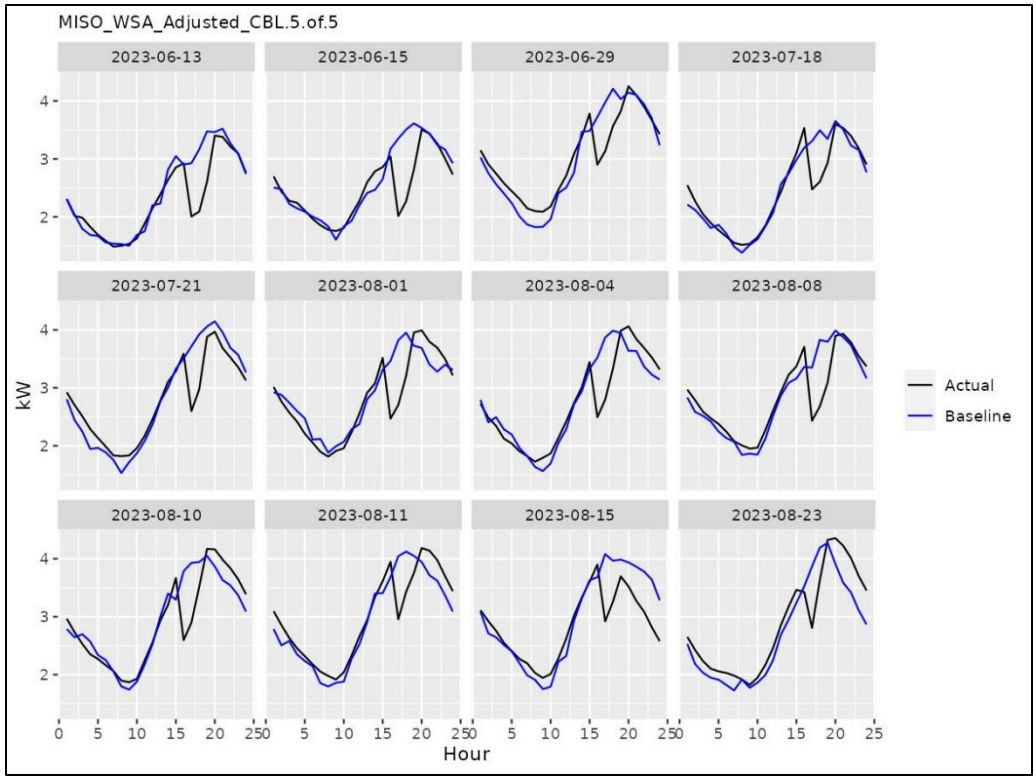


FIGURE 12-4 EASYCOOL BYOT EVENT DAY LOAD SHAPES, PTR-BYOT CROSS PARTICIPANTS

The Evaluators estimated bias and error for the Evaluators MISO models across all sites and when applied on a site-specific basis and selected for the model with the lowest bias. As shown in the table below, the MISO WSA Adjusted CBL 5-of-5 model performed the best and had the lowest bias and error across both cohorts.

TABLE 12-10 MODEL FIT AND BIAS

Model	Follow MISO Protocols	RRMSE	Bias	Selected Model
MISO_WSA_Adjusted_CBL.5.of.5	X	0.037	-0.38%	X
MISO_SMA_Adjusted_CBL.5.of.5	X	0.033	-2.16%	
MISO_Unadjusted_CBL.5.of.10	X	0.040	2.54%	
MISO_SMA_Adjusted_CBL.5.of.10	X	0.043	3.81%	
MISO_Unadjusted_CBL.5.of.5	X	0.087	-7.81%	
MISO_WSA_Adjusted_CBL.5.of.10	X	0.091	8.32%	

12.4.2 GROSS IMPACT FINDINGS

Using results from the CBLs, the Evaluators calculated the PY13 kW reduction. Results are shown below in the table below.

TABLE 12-11 TOTAL GROSS EASYCOOL BYOT DEMAND REDUCTIONS

Measure	Average Savings per Event per Unit (kW)	Average Savings per Event per Participant (kW)	Number of Units	Number of Participants	Total Program kW Reduction
DR Participation: BYOT-only	0.64528	0.83624	5,471	4,221	3,530.06
DR Participation: PTR-BYOT	0.69318	0.85704	655	530	454.02
Total	**0.65040**	**0.83856**	**6,126**	**4,751**	**3,984.08**

The overall verified kW reduction is 3,984.08 kW.

The average savings for the PTR-BYOT cohort shown in the table above were adjusted for cross participation with the PTR program, as detailed in section 12.3.1.5. PTR participants without cross participation (i.e., PTR-only) showed average savings per event per participant of 0.0954 kW.

12.4.3 NET IMPACT FINDINGS

For demand response programs, net savings equals gross savings.

TABLE 12-12 TOTAL EASYCOOL BYOT NET DEMAND REDUCTION RESULTS

Gross kW Reduction	Net-to-Gross Ratio	Net Demand Reduction
3,984.08	100%	3,984.08

Program results can be found in tables in Section 12.1.

12.4.4 NON ENERGY BENEFITS FINDINGS

There were no NEBs identified in this program.

12.4.5 PROCESS FINDINGS

In PY13, the Evaluator conducted staff and implementer interviews and participant surveys as process evaluation activities.

12.4.5.1 Staff and Implementer Interviews

The following section summarizes the key findings from in-depth interviews with two ENO program staff, one APTIM staff, and one Energy Hub staff; ENO staff participated in one interview and APTIM and Energy Hub staff participated in a second interview. These in-depth interviews aimed to learn more about EasyCool Residential BYOT program design and operations, and the successes and challenges experienced during PY13. Interviews lasted approximately 60 minutes and were conducted using the Microsoft Teams platform. The evaluators recorded all interviews with participant permission. The following narrative summarizes these interviews.

12.4.5.1.1 *Program Design and Implementation*

The EasyCool Residential “bring your own thermostat” (BYOT) program targets residential customers interested in participating demand respond events via their smart thermostat. Although the program had originally included small business customers as well, there was low participation among this sector, so staff refocused efforts on residential customers.

Customers enroll in the program via their smart thermostat app or the EasyCool website. They receive a $50 enrollment incentive and $25 for each event they participate in; last year these incentive amounts were switched with customers receiving a $25 enrollment incentive and $50 event participation incentive. Customers who remain enrolled year after year receive a $25 continued enrollment incentive.

Customers do not need to do anything to participate in an event, rather smart thermostats are adjusted remotely. Customers can opt out of events through a system override. Typically events last two to four hours and result and involve thermostats being adjusted an extra three degrees. All events are preceded by a half-hour precool event. Total events per season are capped at 15 but in general there are five to eight events per year.

Program participants receive pre-event notifications about half an hour before the scheduled event via the thermostat itself or the thermostat application. Information is also posted on the Energy Smart website.

12.4.5.1.2 *Marketing*

In PY13 staff sought to enroll 4,600 new customers in the program. Staff promote the program through the other Energy Smart programs that rebate smart thermostats, as well as offered pre-enrollment incentives for customers who purchase smart thermostats through the online marketplace. Smart thermostats also employ various marketing campaigns and promotions to encourage customers to participate in demand response programs like EasyCool.

The program is currently only marketed in English, but staff are exploring Spanish and French translations.

12.4.5.2 EasyCool BYOT Participant Survey

Evaluators conducted a survey of EasyCool BYOT program participants to gather feedback about customers' engagement with and experience of the program. Tracking data provided for the survey indicated 5,431 customers participated in the EasyCool program in 2023. Of these 5,431 participants, 5,141 had a valid email address. Participants were contacted via email once and invited to complete the survey. 511 participants responded to the survey for a response rate of 9.9%.

12.4.5.2.1 *Respondent Characteristics*

Table 12-13 presents respondents' demographic characteristics.

TABLE 12-13 RESPONDENT CHARACTERISTICS (N=511)

Characteristic	%
Housing Type	
Single-family home	70.6%
Duplex or townhome	13.3%
Apartment	13.5%
Manufactured home	0.4%
Business	0.4%
Prefer not to say	1.8%
Housing Age	
Before 1960	42.9%
1960-1979	13.1%
1980-1999	9.8%
2000-2009	6.3%
2010 or later	20.5%
Not sure	6.3%
Housing Status	
Own	87.1%
Rent	11.0%
Prefer not to say	2.0%
Heating Fuel	
Electricity	61.3%
Natural gas	34.2%
Propane	0.4%
Duel fuel	0.8%
Not sure	2.5%
Prefer not to answer	1.0%
Number of people in home	
1 person	27.0%
2 people	36.6%
3 people	14.3%
4 people	13.5%
5 or more people	6.7%
Live above poverty line	
Over	75.3%
Under	10.8%
Not sure	1.6%
Prefer not to answer	11.0%
Education	
Did not graduate high school	0.2%
High school graduate	3.5%
Associate's degree, vocation / technical school, or some college	14.3%
Four-year college degree	30.3%
Graduate or professional degree	47.9%
Prefer not to answer	3.7%

12.4.5.2.2 *Program Awareness*

Respondents learned about the program through a variety of avenues, most commonly the Energy Smart website, their Entergy bill, and an Entergy bill insert. Most respondents enrolled in the program before June 2023 (Figure 12-6). More than half of the respondents installed their thermostat themselves (59.9%, n=306), while just over a third hired a contractor (35.8%, n=183). Two-thirds of respondents enrolled in the program to save money and/or receive an incentive (65.4%, n=334); 20.9% wanted to reduce their energy usage and/or help the environment (n=107).

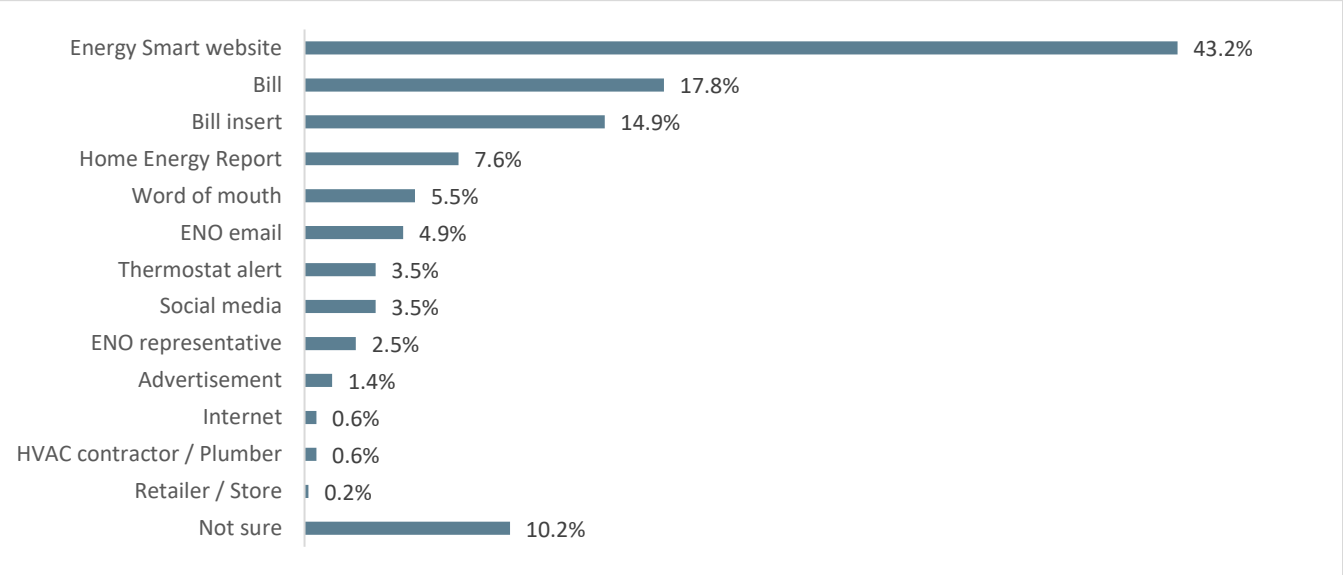


FIGURE 12-5 PROGRAM AWARENESS (N=511)

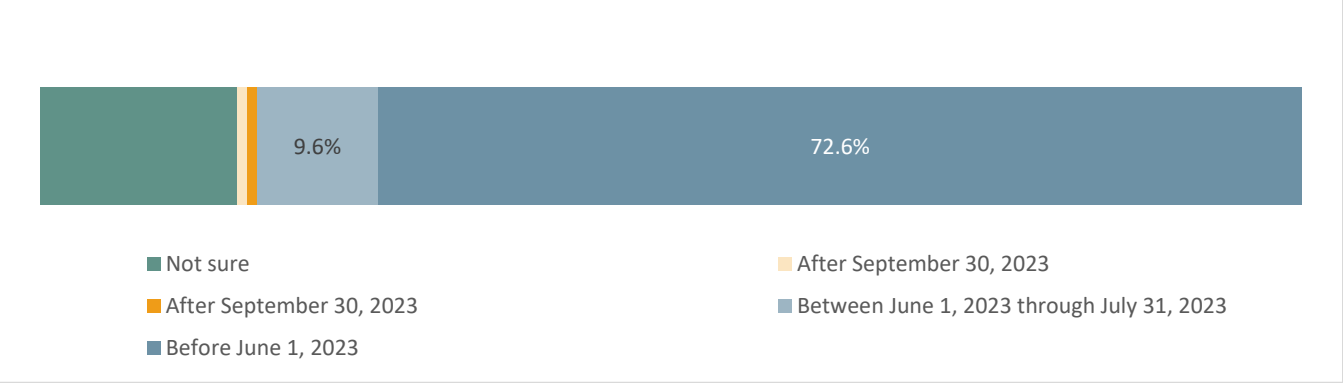


FIGURE 12-6 PROGRAM ENROLLMENT (N=511)

12.4.5.2.3 *Participation in Events*

Entergy New Orleans conducted 12 EasyCool events between June and August 2023. A little less than half of respondents remembered participating in at least one event (45.4%, n=232); 11.2% of respondents did not participate in any of the events (n=57) and 43.4% of respondents did not remember if they participated in any of the events (n=222).

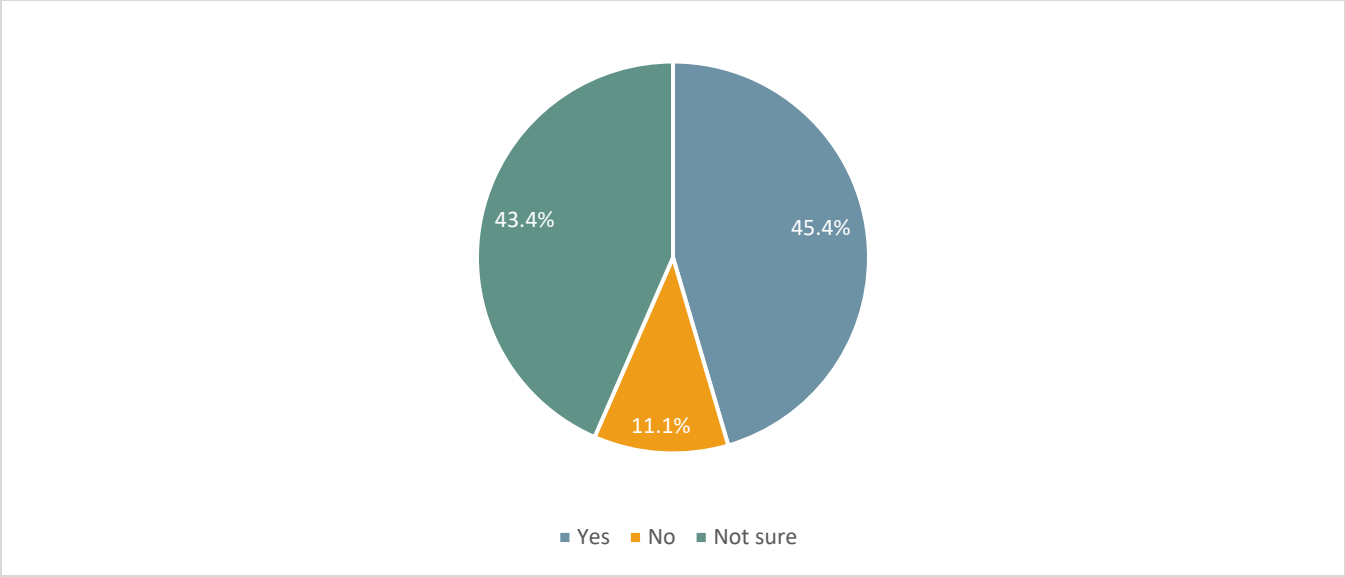


FIGURE 12-7 PARTICIPATED IN AT LEAST ONE EVENT (N=511)

Table 12-14 summarizes participation rates by individual events; these data only include respondents who remembered the event happening and could speak to their participation. Across all the events, about three-quarters of respondents who remembered the event participated. In general, reasons for not participating in an event included not knowing the event was happening, not being home, or it was too hot for comfort.

TABLE 12-14 EVENT PARTICIPATION

Event	Participated
June 13, 2023 from 4-7 p.m. (n=258)	77.5%
June 15, 2023 from 4-7 p.m. (n=257)	76.4%
June 29, 2023 from 3-6:30 p.m. (n=265)	76.6%
July 18, 2023 from 4-7 p.m. (n=260)	76.5%
July 21, 2023 from 4-6 p.m. (n=255)	77.6%
August 1, 2023 from 3-6 p.m. (n=257)	77.8%
August 4, 2023 from 3-6 p.m. (n=262)	76.3%
August 8, 2023 from 4-7 p.m. (n=257)	76.3%
August 10, 2023 from 3-6 p.m. (n=260)	75.4%
August 11, 2023 from 4-7 p.m. (n=257)	77.0%
August 15, 2023 from 4-6 p.m. (n=254)	76.0%
August 23, 2023 from 3:30-6 p.m. (n=259)	76.1%

About one-third of respondents participated in all twelve events (32.2%, n=165) and 16.4% opted out of at least one event (n=84). There were no statistically significant demographic differences between respondents who opted out of at least one event (n=84) and respondents who participated in all 12 events (n=162); the 262 respondents who were unsure about their participation in at least one event were not included in this analysis (Table 12-15).

TABLE 12-15 RESPONDENT CHARACTERISTICS BY PARTICIPATION STATUS (N=249)

Characteristic	Participated in all events	Opted out of at least one event
Housing Type		
Single-family home	72.7%	73.8%
Duplex or townhome	10.9%	14.3%
Apartment	13.3%	10.7%
Manufactured home	1.2%	0.0%
Business	1.2%	0.0%
Prefer not to say	0.6%	1.2%
Housing Age		
Before 1960	38.8%	36.9%
1960-1979	14.5%	21.4%
1980-1999	13.9%	7.1%
2000-2009	7.9%	8.3%
2010 or later	20.6%	16.7%
Not sure	4.2%	9.5%
Housing Status		
Own	88.5%	82.1%
Rent	10.9%	15.5%
Prefer not to say	0.6%	2.4%
Number of people in home		
1 person	22.4%	25.0%
2 people	44.2%	36.9%
3 people	12.7%	15.5%
4 people	13.3%	14.3%
5 or more people	6.6%	7.2%
Live above poverty line		
Over	74.5%	75.0%
Under	11.5%	9.5%
Prefer not to answer	14.0%	15.5%
Education		
Did not graduate high school	0.0%	1.2%
High school graduate	3.0%	6.0%
Associate's degree, vocation / technical school, or some college	15.8%	16.7%
Four-year college degree	34.5%	16.7%
Graduate or professional degree	43.0%	56.0%
Prefer not to answer	3.6%	3.6%

Respondents indicated they prefer to hear about EasyCool events via text message (45.4%, n=232) or email (38.9%, n=199).

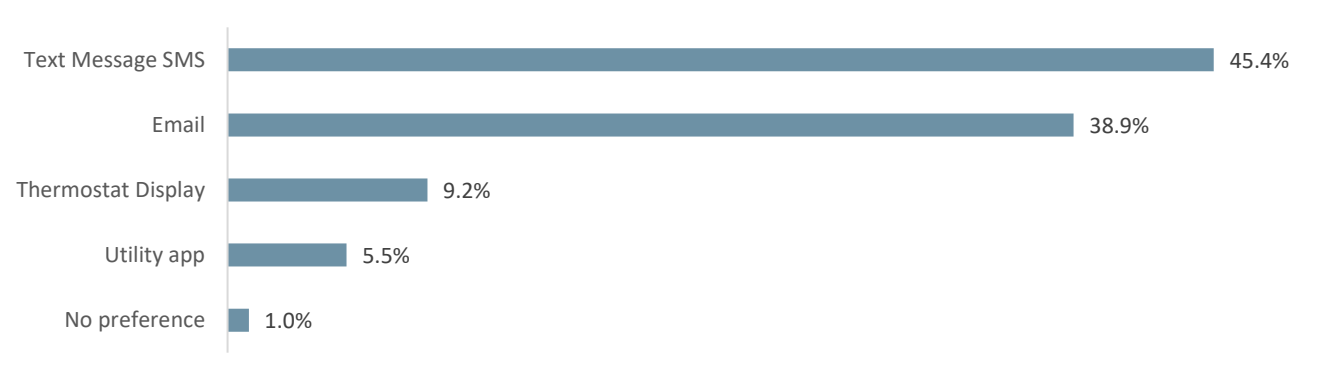


FIGURE 12-8 EVENT NOTIFICATION PREFERENCES (N=511)

12.4.5.2.4 *Program Satisfaction*

Respondents were generally satisfied with the EasyCool program, with ease of enrolling (91.0%, n=465) and the operation of their thermostat (86.5%, n=442) having the highest satisfaction ratings. Ninety-nine respondents were dissatisfied with at least one aspect of the EasyCool program; across these respondents the most common complaints include high bills, poor event notifications, and dissatisfaction towards Energy New Orleans as their service provider. Three quarters of respondents indicated they would recommend the EasyCool program to friends and family (75.3%, n=385). Less than half of respondents indicated they were satisfied with Entergy New Orleans as their service provider (45.6%, n=233).

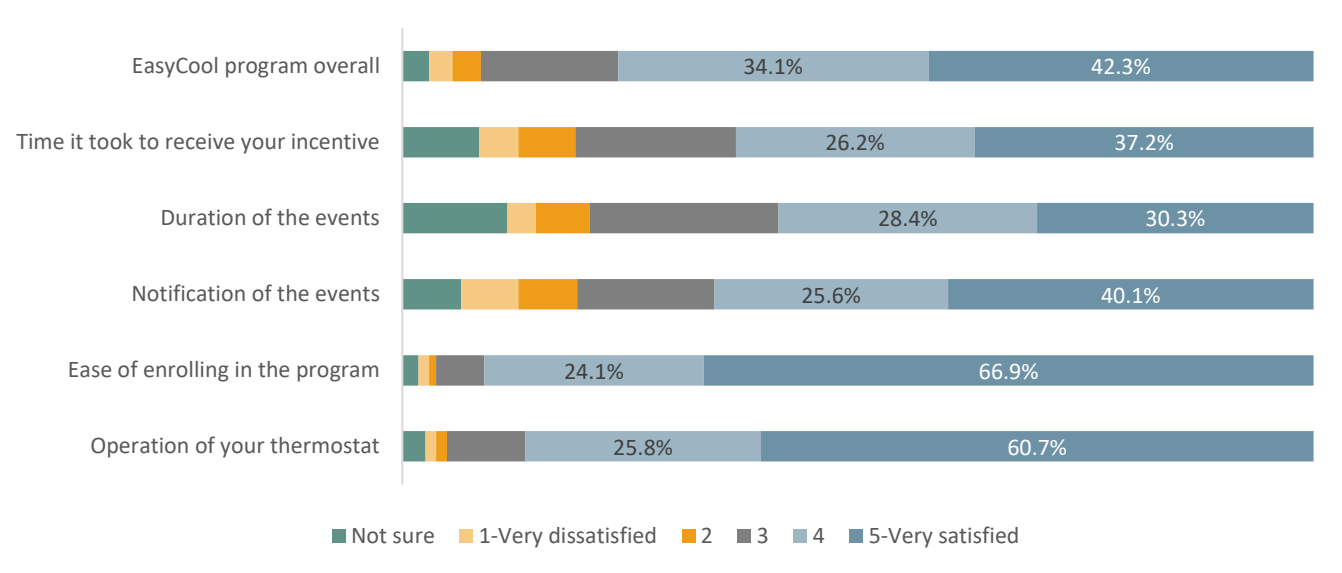


FIGURE 12-9 PROGRAM SATISFACTION (N=511)

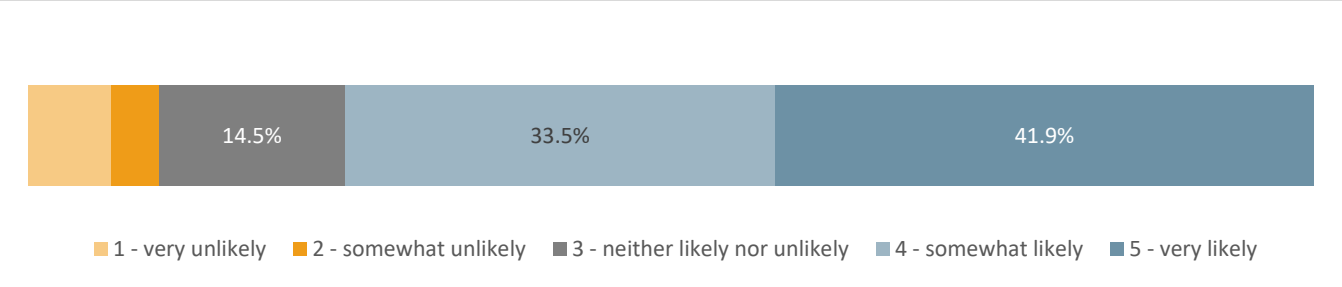


FIGURE 12-10 RECOMMEND EASYCOOL PROGRAM (N=511)

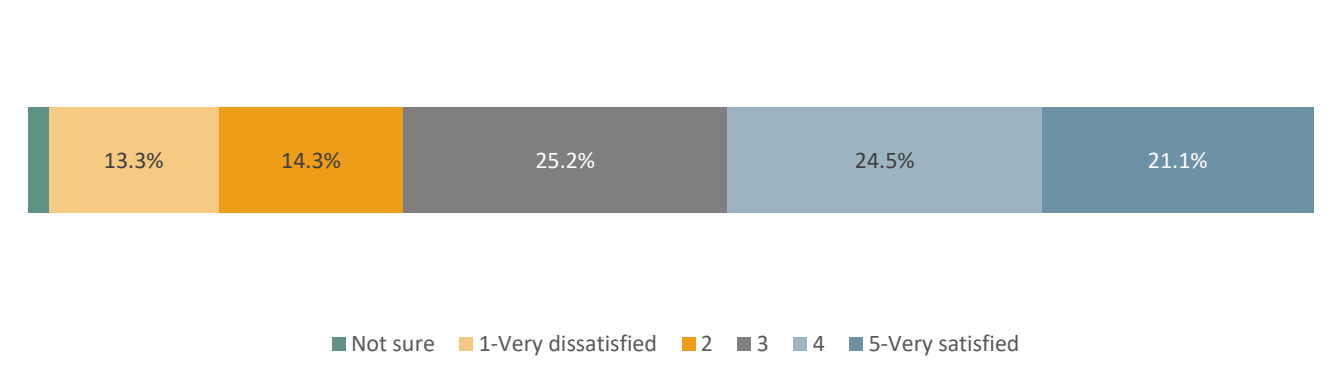


FIGURE 12-11 SATISFACTION WITH ENTERGY AS SERVICE PROVIDER (N=511)

Respondents who opted out of an event (n=84) were more likely to express dissatisfaction with the event notifications and event duration than respondents who participated in every event (n=165) ($p<0.01$). There were no other statistically significant differences between participation status across other satisfaction categories (Table 12-16).

TABLE 12-16 RESPONDENTS' SATISFACTION BY PARTICIPATION STATUS (N=249)

Characteristic	Participated in all events	Opted out of at least one event
EasyCool Program Overall		
Dissatisfied (1 or 2 rating)	3.7%	7.5%
Satisfied (4 or 5 rating)	82.7%	77.5%
Neither (3 rating)	13.6%	15.0%
Time to receive incentive		
Dissatisfied (1 or 2 rating)	11.5%	10.7%
Satisfied (4 or 5 rating)	66.7%	66.7%
Neither (3 rating)	21.8%	22.6%
Duration of the events*		
Dissatisfied (1 or 2 rating)	9.1%	7.1%
Satisfied (4 or 5 rating)	70.3%	47.6%
Neither (3 rating)	20.6%	45.2%
Notification of the events*		
Dissatisfied (1 or 2 rating)	7.3%	16.7%
Satisfied (4 or 5 rating)	12.7%	28.6%
Neither (3 rating)	80.0%	54.8%
Ease of enrolling in the program		
Dissatisfied (1 or 2 rating)	1.8%	1.2%
Satisfied (4 or 5 rating)	3.6%	7.1%
Neither (3 rating)	94.5%	91.7%
Operation of thermostat		
Dissatisfied (1 or 2 rating)	2.4%	3.6%
Satisfied (4 or 5 rating)	89.7%	85.7%
Neither (3 rating)	10.7%	7.9%
Likelihood to recommend program		
Unlikely (1 or 2 rating)	10.9%	13.1%
Likely (4 or 5 rating)	78.2%	75.0%
Neither (3 rating)	10.9%	11.9%
Entergy as service provider		
Dissatisfied (1 or 2 rating)	29.7%	25.3%
Satisfied (4 or 5 rating)	47.9%	51.8%
Neither (3 rating)	22.4%	22.9%
*p<0.001		

12.5 Data Tracking Review

The Evaluators were able to perform the analysis as planned once advanced metering infrastructure (AMI) data was provided. The Evaluators found that roughly 85% of participants had AMI data during the evaluation period. ENO found that this occurred due to participants with inactive accounts. All participants in the participant data that were not present in the AMI data were removed from the analysis when extrapolating kW reduction impacts.

12.6 Key Findings and Recommendations

The following summarizes the key findings from the PY13 evaluation.

- Attainment of Demand Reduction Target: The program successfully achieved 41% of its *ex post* gross demand reduction target, indicating significant progress towards its overarching goal of reducing demand on the grid. This achievement underscores the effectiveness of the program's strategies and initiatives in incentivizing energy conservation and efficiency among participants.
- Increase in Program Participation: The addition of 2,000 new participants in PY13 reflects a notable 156% increase in program participation compared to previous years. This surge in participation demonstrates growing awareness and interest among consumers in engaging with energy efficiency programs, highlighting the program's success in expanding its reach and impact.
- Consistency in Opt-Out Rates: Despite program expansion, opt-out rates for Demand Response (DR) events remained consistent with historical trends, ranging from 20% to 30%. This stability suggests that the program has maintained effective communication and engagement strategies to retain participants while providing them with flexibility in their involvement in DR events.
- AMI Data and Participant Tracking: Approximately 15% of BYOT participants were identified as lacking Advanced Metering Infrastructure (AMI) data, indicating potential discrepancies in participant tracking and data management. The evaluation highlights the importance of ensuring comprehensive data collection and tracking mechanisms to accurately assess program performance and participant engagement.
- Cross Participation and Savings Adjustments: A notable proportion (11%) of BYOT participants exhibited cross participation with the Peak Time Rebate (PTR) program, necessitating adjustments in savings calculations to account for overlapping participation and avoid double-counting of energy savings. This recommendation underscores the importance of refining evaluation methodologies to accurately quantify program impacts in the presence of participant overlap.
- Program Awareness via Online Platforms: The Energy Smart website emerged as a prominent channel for program awareness, with 45% of survey respondents citing it as their source of program information. This finding emphasizes the critical role of online platforms in disseminating program information and engaging with target audiences effectively.
- Opt-Out Dissatisfaction and Communication: Dissatisfaction with event notifications and durations was observed among opt-out respondents, indicating potential areas for improvement in communication strategies and event planning. Addressing these concerns can enhance participant satisfaction and retention, ultimately bolstering program effectiveness.
- Motivations for Enrollment: Financial incentives emerged as the primary motivator for program enrollment, with a significant majority of respondents driven by the prospect of cost savings or incentives. This insight underscores the importance of designing incentive structures that resonate with consumer preferences and priorities to encourage program participation.
- Preference for Text Message Notifications: Survey respondents expressed a preference for text message notifications over other communication modalities, highlighting the importance of leveraging mobile technology to deliver timely and relevant program updates and alerts. Embracing text-based communication can enhance participant engagement and responsiveness.

- Common Complaints and Areas for Improvement: Dissatisfaction with various aspects of the program, including high bills, inadequate event notifications, and dissatisfaction with the service provider, underscores the need for continuous improvement and refinement in program design and implementation. Addressing these common complaints can enhance overall participant satisfaction and program effectiveness.

The Evaluators have the following recommendations after completing the PY13 evaluation.

- Alignment of Demand Response Event Times: It is recommended to synchronize the start and end times of demand response events for customers with cross participation in multiple programs. This alignment ensures consistency in measuring savings impacts across programs and minimizes distortions in baseline models caused by overlapping event schedules.
- Commencement of Events on the Hour: When hourly interval Advanced Metering Infrastructure (AMI) data is available, demand response events should commence and conclude on the hour. This practice ensures precise measurement of energy reductions by aligning event durations with the hourly intervals captured in the data, facilitating accurate assessment of program effectiveness.
- Aggregation of Interval AMI Data: Interval AMI data should be aggregated to the hourly level based on the hour-ending datetime. By adhering to this aggregation method, program administrators can maintain accuracy in usage measurement, avoiding inconsistencies or errors associated with aggregating data across multiple hours.
- Monitoring of Event Frequency: Implementers of demand response programs with cross participants should monitor the frequency of events called across all programs within a sector, particularly residential programs. This monitoring helps preserve the availability of proxy days used for testing baseline models, ensuring robust evaluation methodologies and accurate assessment of program impacts.
- Consideration of Event Scheduling: To mitigate potential reductions in available proxy days due to excessive event scheduling, it is advisable to consider calling events for residential demand response programs on the same dates. By aligning event schedules, program administrators can optimize the use of proxy days and maintain the integrity of baseline models, facilitating comprehensive program evaluation and analysis.

13 PEAK TIME REBATE PILOT

13.1 Summary

The tables below report *ex ante* gross, *ex post* gross, *ex post* net energy savings (kWh) (both annual and lifetime), demand reductions (kW), participation, incentive spend, and *ex post* net NEBs, by measure, where applicable.

TABLE 13-1 PY13 PTR ENERGY SAVINGS (KWH)

Measure	*Ex ante* Gross Savings (kWh)	Realization Rate (kWh)	*Ex post* Gross Savings (kWh)	NTG	*Ex post* Net Savings (kWh)
DR Participation: PTR-only	0	N/A	0	N/A	0
DR Participation: PTR-BYOT	0	N/A	0	N/A	0
Total	**0**	**N/A**	**0**	**N/A**	**0**

Sums may differ due to rounding.

TABLE 13-2 PY13 PTR DEMAND REDUCTIONS (KW)

Measure	*Ex ante* Gross Demand (kW)	Realization Rate (kW)	*Ex post* Gross Demand (kW)	NTG	*Ex post* Net Demand Reductions (kW)
DR Participation: PTR-only	0.00	N/A	194.91	100%	194.91
DR Participation: PTR-BYOT	0.00	N/A	5.55	100%	5.55
Total	**0.00**	**N/A**	**200.46**	**100%**	**200.46**

Sums may differ due to rounding.

TABLE 13-3 PY13 PTR LIFETIME SAVINGS SUMMARY

Measure	EUL	*Ex post* Gross Lifetime Energy Savings (kWh)	*Ex post* Net Lifetime Energy Savings (kWh)
DR Participation: PTR-only	1	0	0
DR Participation: PTR-BYOT	1	0	0
Total	**1**	**0**	**0**

Sums may differ due to rounding.

TABLE 13-4 PY13 PTR PARTICIPATION AND INCENTIVE SUMMARY

Measure	Participation (Count of Measures)	Incentive Spend ($)
DR Participation: PTR-only	2,043	$10,231
DR Participation: PTR-BYOT	529	$2,649
Total	**2,572**	**$12,880**

Sums may differ due to rounding.

TABLE 13-5 PY13 PTR NEB SUMMARY

Measure	*Ex post* Net ARCs ($)	*Ex post* Net Water Savings (gallons)	*Ex post* Net Avoided Arrearages
DR Participation: PTR-only	$0	0	$0
DR Participation: PTR-BYOT	$0	0	$0
Total	**$0**	**0**	**$0**

Sums may differ due to rounding.

13.2 Program Description

The Peak Time Rebate (PTR) offering provides incentives to residential customers for reducing their energy usage during short periods of high electricity usage. The offer was made available on a limited basis to the first customers to sign up during the Pilot phase.

Customers enrolled in the PTR pilot receive an email notification to reduce energy usage during short periods of high electricity usage, also known as peak demand events. The email shares tips on how to electric usage during peak demand events. A maximum of 15 demand response events are called in a year.

- Enrolled customers receive the following:
- An email at least 24 hours in advance of a scheduled peak demand event with the date and time of the event.
- An email at the start of the event with specific recommendations on how to reduce electricity usage.
- An email at the end of the event, letting them know the event has ended.
- An email after peak season, totaling energy saved across the peak demand events and the amount of the earned cash incentive.
- A check in the mail for the total incentive earned.
    - Low savers: $10
    - Medium savers: $20

- High savers: $50

The pilot was fully subscribed in PY13.

13.2.1 PROGRAM CHANGES

PY13 was the first year for the PTR offering.

13.2.2 TIMING OF PROJECTS

All enrollments occurred from May to July in 2023, as shown in the table below.

TABLE 13-6 NUMBER OF ENROLLMENTS BY MONTH

Enrollment Month	Number of Enrollments
May, 2023	107
June, 2023	575
July, 2023	2,088
Total	**2,770**

13.2.3 TRADE ALLIES

There were no reported trade allies in this program.

13.2.4 GOAL ACHIEVEMENT

The table below summarizes the programs' performance against goal.

TABLE 13-7 PTR PERFORMANCE TOWARDS GOAL

Ex post Gross Energy Savings (kWh) Goal	% to kWh Goal	*Ex post* Gross Energy Savings (kWh)	*Ex post* Gross Savings (kW) Target	% to kW Target	*Ex post* Gross Savings (kW)
0	N/A	0	714.00	28%	200.46

13.3 EM&V Methodology

The Evaluators employed the following approach to complete impact evaluation activities for the program. The Evaluator followed the Calculated Baseline approach outlined in the Midcontinent Independent System Operator, Inc. (MISO) Business Practices Manual (BPM)[13]. The following impact evaluation steps were taken to determine the suitability of the MISO Calculated Baseline approach:

- Developed an Unadjusted Consumption (UC) Baseline, a Symmetric Multiplicative Adjustment (SMA) Baseline, and a Weather Sensitive Adjustment (WSA) Baseline for each program participant. Loads were calculated utilizing 1-hour AMI data.

[13] *Ibid.*

- Determined days that will serve as proxy days for testing the suitability of the baseline approach. Proxy days represent days like demand response event days in terms of load shape and temperature profiles.
- Estimated bias (uncertainty) and error on proxy days for each model to assess baseline performance. Bias is assessed by examining the average percent error of the baseline predictions relative to the actual usage on proxy days. In a similar manner, error is assessed through various metrics such as Root Mean Squared Error (RRMSE) using baseline predictions and actual usage on proxy days.
- Selected the baseline model with the lowest absolute bias.

13.3.1GROSS IMPACT METHODOLOGIES

In the evaluation of demand response programs, energy savings are estimated by comparing a participant's load shape during a demand response event with a baseline load shape. This baseline load is assumed to be a good estimate of the counterfactual load—that is, the load that would have manifested had there not been an event called that day.

13.3.1.1 Data Sources

Data used for this evaluation include program tracking data that identifies which customers participated in the program and contains data fields such as hourly usage, hourly interval meter data (AMI) for each customer participating in the program, and a full schedule of DR program events, including the time of the event.

13.3.1.2 MISO Calculated Baseline Approach (Customer Baselines)

The following details the general requirements for the MISO Calculated Baseline Approach. The Evaluators developed Customer Baselines (CBLs) in accordance with this approach. For a demand resource, the Consumption Baseline is a profile of hourly demand based on an averaged sample of historical data which may be adjusted for factors that reflect specific, on-the-day conditions, such as temperature.

The default consumption baseline is designed as follows:

- Separate hourly demand profiles for non-holiday weekdays and for weekends/holidays
- The "weekday" hourly profile is based on the average of the ten (10), but not less than five (5), most recent weekdays that are not holidays or other non-standard "event" days
- The "weekend/holiday" hourly profile is based on the average of the four (4), but not less than two (2), most recent weekend days or holidays that are not "event" days
- An "event" day is one during which there was, for the resource in question, a real- time energy or ancillary services dispatch, or a scheduled outage
- The maximum look-back window is limited to 45 days
- If the 45-day window contains insufficient days to meet the minimum number of days described above, the profiles are constructed based on the available days within the 45-day window that qualify, supplemented by the largest (MW) matching "event" day(s) values for that resource within that same window as necessary to obtain the minimum number of values.

Adjustment mechanisms to the default Consumption Baseline include:

- Symmetric Multiplicative Adjustment (SMA)
    - Adjusts each baseline hourly value (MW) during the event up or down by the ratio of

  - (a) the sum of hourly demands for the three hours beginning four hours prior to the event and (b) the sum of those same three hourly baseline demands
  - The adjustment is limited to a change in any individual baseline hour of plus or minus 20 percent.
  - If multiple events occur during the same day, the SMA is calculated only for the first event, but applied to all events that day.
- Weather Sensitive Adjustment (WSA)
  - Adjusts each baseline hourly value (MW) up or down by a Weather Adjustment Factor
  - The Weather Adjustment Factor is determined by a mathematical relationship derived through a regression analysis that considers the DRR load and historical hourly temperature data.

13.3.1.3 Evaluators MISO Models

The following CBL models were developed for each customer in accordance with MISO protocols.

For a 10-of-10 (or 5-of-5) unadjusted baseline, the Evaluators examine the load data from the most recent ten (or five) non-event, non-holiday weekdays relative to the event day and calculate the mean demand usage values of the highest load days. This baseline is then adjusted for the SMA and WSA models utilizing the method described in Section 13.3.1.2.

TABLE 13-8 EVALUATORS' MISO CBL MODELS

Model Type	Baseline Days	SMA	WSA
Unadjusted	10-of-10	No	No
SMA-Adjusted	10-of-10	Yes	No
WSA-Adjusted	10-of-10	No	Yes
Unadjusted	5-of-5	No	No
SMA-Adjusted	5-of-5	Yes	No
WSA-Adjusted	5-of-5	No	Yes

13.3.1.4 Baseline and Proxy Day Development

The Evaluators defined proxy days as the top eight non-event, non-holiday, non-weekend days with the highest loads across all summer months. In addition, proxy days must display a maximum temperature of greater than or equal to the minimum temperature observed during normal curtailment hours during the events. The Evaluators used these defined proxy days to determine the ability of CBL models to predict actual usage for each customer.

13.3.1.5 Cross Program Participation Adjustments

Customers who participate in multiple demand response programs will have double counted savings if the savings estimates are not adjusted in each program where cross participation occurs. For some DR programs, the source of curtailment for the respective DR programs is fully independent, such as for the Battery Energy Storage System (BESS) Pilot program and the BYOT program (battery storage versus smart thermostat). When the curtailment source is independent between two DR programs, cross participants for the two programs are removed during the impact estimation. The per unit or per account savings reductions are then extrapolated to

the full population. For example, removing customers with dual enrollment in BYOT and BESS ensures that the BYOT-only savings estimates does not include impacts from the BESS program. For PY13, this method was also used for some DR programs with cross participation when the size of the cross-participant sub cohort would have been too small to estimate savings accurately (e.g., only 2 participants were found in PTR and BESS).

For other DR programs, the curtailment source driving the demand response impact overlaps, such as for BYOT and PTR, where both programs may both involve curtailment of cooling loads. In this case, a savings estimate was developed for participants with and without cross participation. The savings for those with cross participation was adjusted using the savings for those without cross participation in the respective programs, according to the following equation:

$$Cross\ Participant\ kW\ Reduction\ for\ PTR\ Program\ (PTR-BYOT\ Cohort) = Average\ kW\ Reduction\ (PTR-BYOT) * ((Average\ kW\ Reduction\ (PTR-only))/ (Average\ kW\ Reduction(BYOT-only) + Average\ kW\ Reduction\ (PTR-only))$$

Where:

$Average\ kW\ Reduction\ (PTR-BYOT)$ = Average estimated kW reduction for participants in both PTR and BYOT.

$Average\ kW\ Reduction\ (BYOT-only))$ = Average estimated kW reduction for participants in BYOT only.

$Average\ kW\ Reduction\ (PTR-only))$ = Average estimated kW reduction for participants in PTRonly.

The adjustment for the PTR-BYOT cross participant savings estimate reflects the percentage share of the PTR-only savings estimate out of the total savings for BYOT-only and PTR-only combined. A separate adjustment following similar logic occurs in the BYOT program to remove overlapping savings between BYOT and PTR cross participants.

13.3.1.6 Cohort Creation

The Evaluators created the following cohorts for the PTR Pilot in PY13. Participants without AMI data during DR events (approximately 7.1% of participants) were considered to have inactive accounts and were excluded from the extrapolation of estimated savings.

TABLE 13-9 PTR MEASURES

Measure (Cohort)	Total Number of Accounts in Participant Data	Number of Accounts with AMI Data
DR Participation: PTR-only	2,200	2,043
DR Participation: PTR-BYOT	570	529
Total	**2,770**	**2,572**

13.3.1.7 Savings Calculations and Extrapolation

The Evaluators estimated the Average kW Savings per Event per Participant using participants with complete AMI data during all events. The estimate is extrapolated and weighted based on the number of participants with AMI data on each demand response event date.

The Average kW Savings per Event per Participant is the average kW reduction for each participant across all demand response events in the season, as shown in the equations below.

$$Average\ kW\ Savings\ per\ Event\ per\ Participant = (\sum_{i=1}^{n} Average\ kW\ Reduction\ per\ Event_i)\ /n$$

$$Average\ kW\ Reduction\ per\ Event_i = (\sum_{h=1}^{hours} (Baseline\ kW_{ih} - Actual\ kW_{ih}))/hours$$

Where,

i = an indicator for participant *i*;

h = indicator for event hour *h;*

n = Total number of participants;

hours = total number of event hours;

$Baseline\ kW_{ih}$ = Baseline kW for participant *i* during event hour *h*.

$Actual\ kW_{ih}$ = Actual kW for participant *i* during event hour *h*.

The Evaluators also calculated the Average kW Savings per Event per Device as shown in the following equation:

$$Average\ kW\ Savings\ per\ Event\ per\ Device = Average\ kW\ Savings\ per\ Event\ per\ Participant * (\frac{Number\ of\ Devices}{Number\ of\ Participants})$$

13.3.2NET IMPACT METHODOLOGIES

In demand response programs, it is typically assumed that there are neither spillover nor free-ridership effects (customers are not expected to curtail without participating). Although customers can find workarounds to make up for lost productivity due to demand response events, they are compensated only if they reduce their load during the peak demand window, the primary program goal. As such, the net-to-gross ratio for this program is assumed to be 100%.

13.4 Evaluation Findings

The Evaluators determined that 21% of PTR participants were also enrolled in the EasyCool BYOT program; therefore, savings were adjusted for cross participation. Savings for cross participants were adjusted to avoid

double counting impacts across the two DR programs. The method of adjusting savings for cross participation is detailed in the Gross Impact Methodologies section.

The Evaluators defined two measure types for the PTR pilot: 1) PTR-only, representing participants that are only enrolled in the PTR pilot, and 2) PTR-BYOT, representing PTR participants that are dual enrolled in the BYOT program.

Two small DR Pilots ran concurrently with PTR in PY13, the Battery Energy Storage Solutions (BESS) Pilot and the Electric Vehicle (EV) Charging Pilot, and both showed some cross participation with PTR. The Evaluators removed cross participants with the BESS Pilot when estimating savings for PTR because there were only two PTR-BESS cross participants, and this represented an insufficient cohort size for estimating impacts. In addition, the Evaluators found no evidence that the two PTR-BESS cross program participants discharged their battery systems during PTR events on days when BESS events were not called. In future programs years, the PTR program may need to adjust for cross participation with the BESS program in the same way the PTR pilot adjusts for cross participation with the BYOT program because it is likely that a small percentage of PTR-BESS cross participants will discharge their battery in response to PTR events.

For the EV Charging Pilot, there are no demand response events for the program and the Evaluators estimated peak demand impacts for the EV Charging Pilot utilizing days when no demand response events were called. In addition, for PTR and EV Pilot cross participants, the PTR baselines incorporate any impacts from the EV Pilot so there is no need to adjust either program for cross participation.

TABLE 13-10 EVENT DATES AND TIMES

Event Dates	Event Times (CDT)
8/1/2023	4:00-7:00
8/4/2023	4:00-7:00
8/8/2023	4:00-7:00
8/9/2023	4:00-7:00
8/10/2023	4:00-7:00
8/23/2023	3:30-6:00

13.4.1 LOAD SHAPES AND MODEL PERFORMANCE

The figures below are average load shapes for each subgroup on proxy and event days and depict actual kWh and baseline kWh for the selected baseline model. The figures show that baseline kWh is a good match for actual kWh during the hours of curtailment on most proxy days.

The Evaluators note that the temperature changes underlying the WSA baseline model sometimes drive a wedge between the baseline and proxy day usage, however, these differences are expected to average out across events. The SMA model had substantially higher bias than the WSA model on proxy days and was not selected for the baseline. The poor performance of the SMA model occurred due to the need to push the offset adjustment hour back two hours earlier from the PTR event start time because EasyCool BYOT events were called one hour earlier than PTR events and BYOT comes with pre-cooling that would have affected the baseline adjustment.

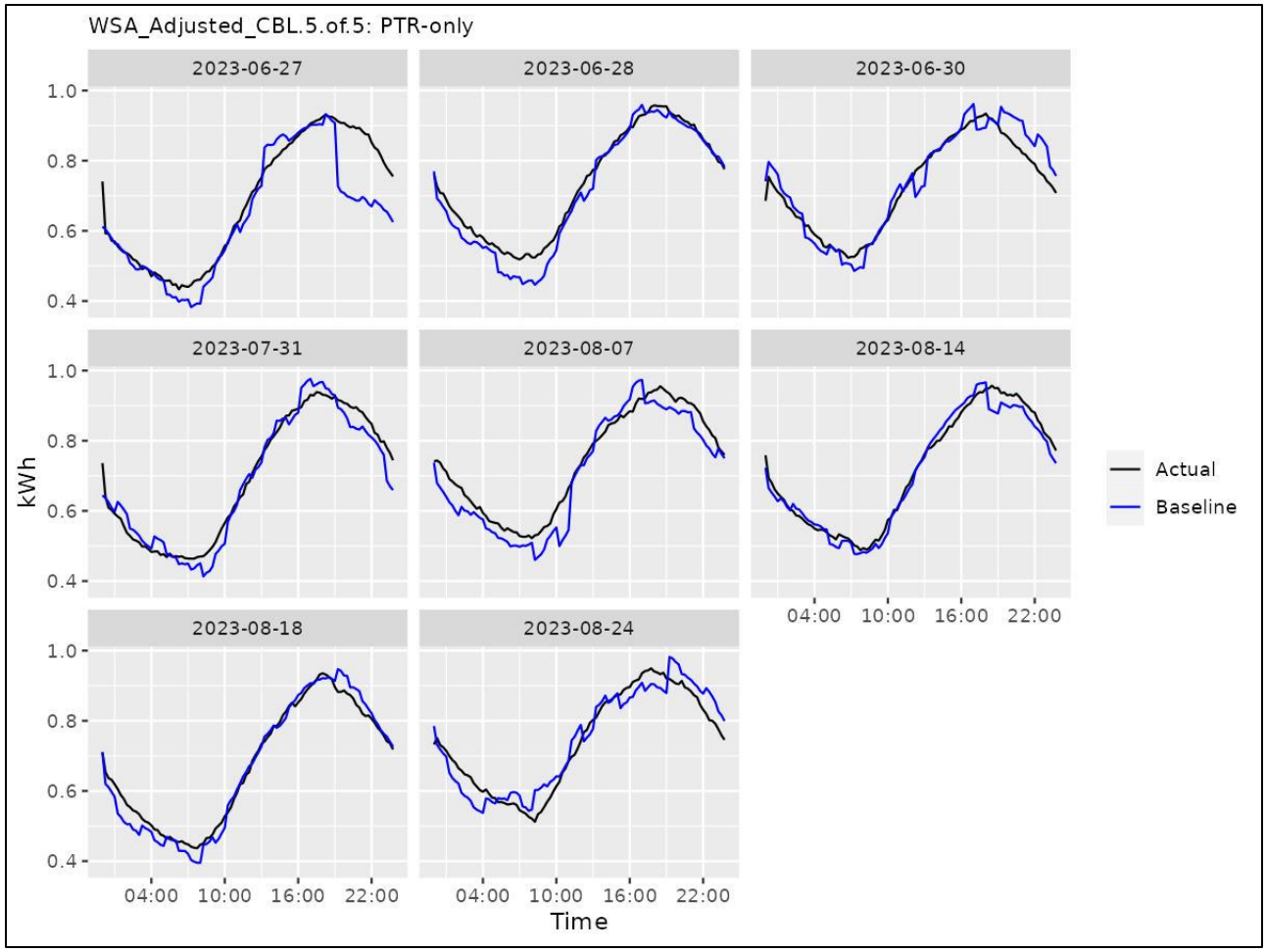


FIGURE 13-1 PTR PROXY DAY LOAD SHAPES, PTR-ONLY

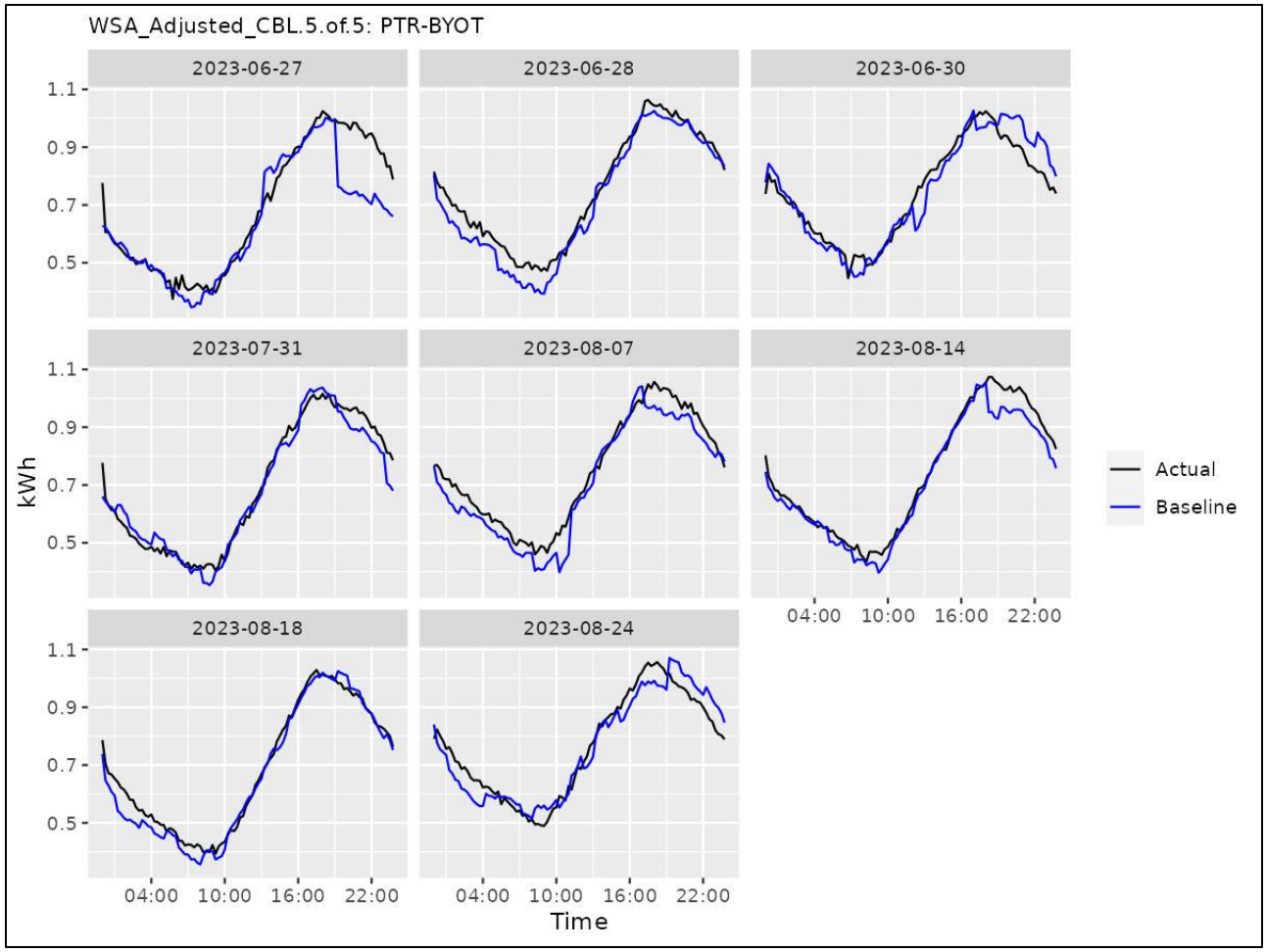


FIGURE 13-2 PTR PROXY DAY LOAD SHAPES, PTR-BYOT CROSS PARTICIPANTS

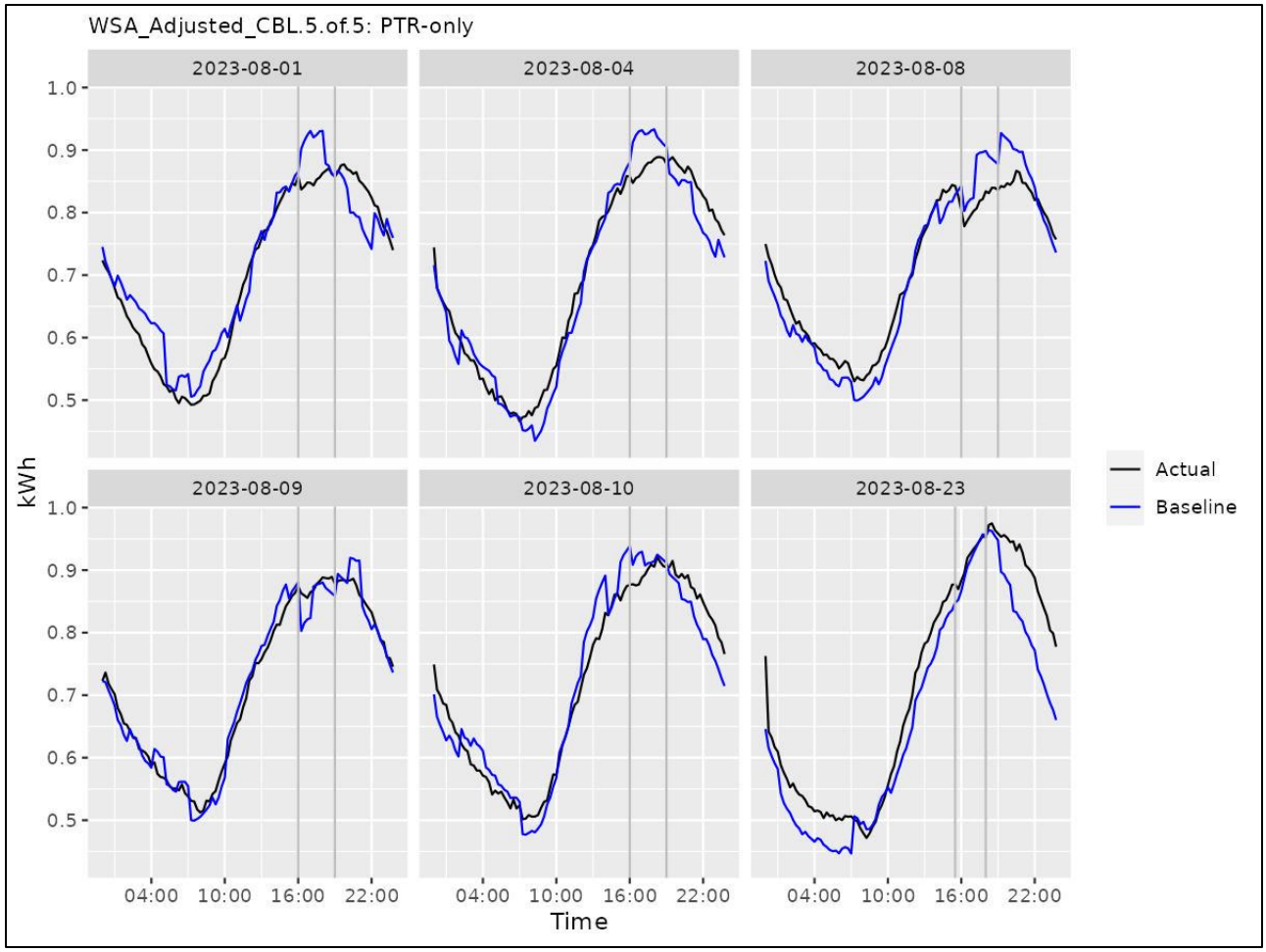


FIGURE 13-3 PTR EVENT DAY LOAD SHAPES, PTR-ONLY

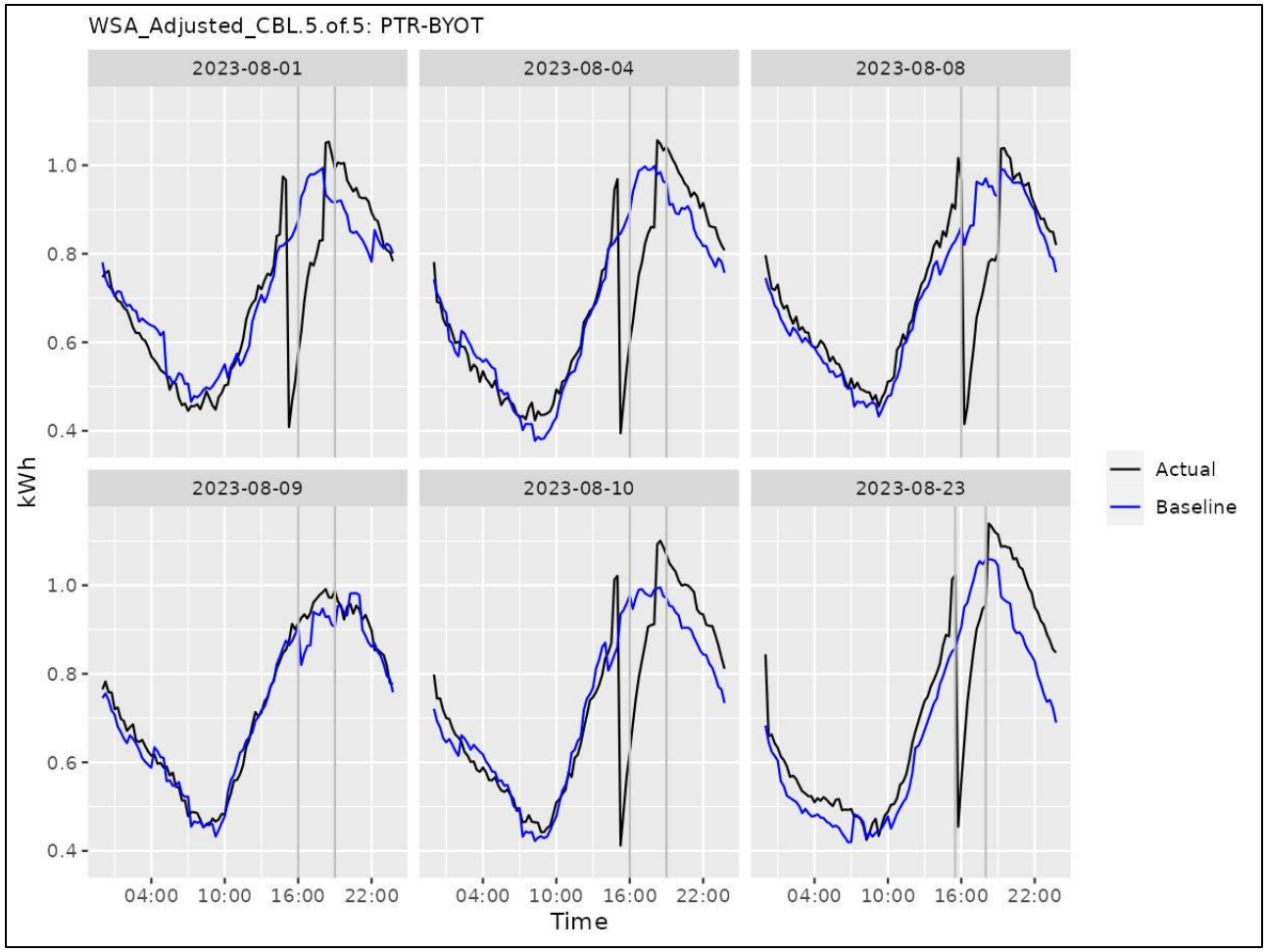


FIGURE 13-4 PTR EVENT DAY LOAD SHAPES, PTR-BYOT CROSS PARTICIPANTS

The Evaluators estimated bias and error for the Evaluators MISO models across all sites and when applied on a site-specific basis and selected for the model with the lowest bias. As shown in the table below, the MISO WSA Adjusted CBL 5-of-5 model performed the best and had the lowest bias and error for both measure cohorts.

TABLE 13-11 MODEL FIT AND BIAS

Measure (Cohort)	Model	Follow MISO Protocols	RRMSE	Bias	Selected Model
DR Participation: PTR-BYOT	WSA_Adjusted_CBL.5.of.5	X	0.042	-2.18%	X
DR Participation: PTR-BYOT	WSA_Adjusted_CBL.10.of.10	X	0.044	-2.43%	
DR Participation: PTR-BYOT	SMA_Adjusted_CBL.5.of.5	X	0.111	-9.91%	
DR Participation: PTR-BYOT	SMA_Adjusted_CBL.10.of.10	X	0.110	-10.23%	
DR Participation: PTR-BYOT	Unadjusted_CBL.5.of.5	X	0.150	-14.11%	
DR Participation: PTR-BYOT	Unadjusted_CBL.10.of.10	X	0.150	-14.44%	
DR Participation: PTR-only	WSA_Adjusted_CBL.5.of.5	X	0.033	-0.11%	X
DR Participation: PTR-only	WSA_Adjusted_CBL.10.of.10	X	0.033	-0.14%	
DR Participation: PTR-only	SMA_Adjusted_CBL.10.of.10	X	0.069	-5.91%	
DR Participation: PTR-only	SMA_Adjusted_CBL.5.of.5	X	0.076	-6.05%	
DR Participation: PTR-only	Unadjusted_CBL.5.of.5	X	0.117	-10.63%	
DR Participation: PTR-only	Unadjusted_CBL.10.of.10	X	0.115	-10.75%	

13.4.2 GROSS IMPACT FINDINGS

Using results from the CBLs, the Evaluators calculated the PY13 kW reduction. Results are shown below in the table below.

TABLE 13-12 TOTAL GROSS PTR DEMAND REDUCTIONS

Measure	Average Savings per Event per Participant (kW)	Number of Participants	Total Program kW Reduction
DR Participation: PTR-only	0.09540	2,043	194.91
DR Participation: PTR-BYOT	0.01049	529	5.55
Total	**0.07793**	**2,572**	**200.46**

The overall verified kW reduction is 200.46 kW.

The average savings for the PTR-BYOT cohort shown in the table above were adjusted for cross participation with the BYOT program, as detailed in section 12.3.1.5. BYOT participants without cross participation (i.e., BYOT-only) showed average savings per event per participant of 0.8362 kW.

Table 13-13 provides the gross demand reductions per event for the PTR-only cohort. While there is significant day-to-day variation in the demand reductions due to the small treatment impact, the average demand reduction impact across event days is an unbiased estimate.

TABLE 13-13 GROSS DEMAND REDUCTIONS PER EVENT

Measure (Cohort)	Event Date	Average Savings per Event per Participant (kW)	Number of Participants	Total Program kW Reduction
DR Participation: PTR-only	8/1/2023	0.20645	2,043	421.77
DR Participation: PTR-only	8/4/2023	0.19846	2,043	405.46
DR Participation: PTR-only	8/8/2023	0.20528	2,043	419.38
DR Participation: PTR-only	8/9/2023	-0.08942	2,043	-182.68
DR Participation: PTR-only	8/10/2023	0.08084	2,043	165.17
DR Participation: PTR-only	8/23/2023	-0.02918	2,043	-59.65

13.4.3 NET IMPACT FINDINGS

For demand response programs, net savings equals gross savings.

TABLE 13-14 TOTAL EASYCOOL BYOT NET DEMAND REDUCTION RESULTS

Gross kW Reduction	Net-to-Gross Ratio	Net Demand Reduction
200.46	100%	200.46

13.4.4 NON ENERGY BENEFITS FINDINGS

There were no NEB identified in this program.

13.4.5 SAVER TYPE COMPARISON

The Evaluators compared participant saver types for ex ante and ex post saver type classifications, as shown in Table 13-15. A participant was classified as either positive or negative, depending on whether they exhibited positive or negative cumulative kWh savings during events[14]. A participant was considered a positive saver type under the ex-ante saver type classification if they were assigned Low, Medium, or High savings. The analysis was restricted to PTR-only participants to remove impacts from PTR-BYOT cross participation.

[14] The Negative saver type classification also includes those with zero kWh savings during events.

Sixty-six percent of the time, the saver type was the same for ex ante versus ex post classifications. Four percent of the time, the ex-ante saver type was positive while the ex-post saver type was negative. In addition, 29% of the time, the ex-post saver type was positive, and the ex-ante saver type was negative.

Taken together, the comparison indicates that the ex-post baseline model was higher than the ex-ante baseline model. For instance, the ex-post results show that 56% of the time, participants had positive kWh savings across all events, while the ex-ante saver type classification estimated only 31% of participants had positive kWh savings during events. This finding also indicates that roughly 25% of participants did not receive incentive payments due to the ex-ante baseline models being too low.

TABLE 13-15 SAVER TYPE COMPARISON

Ex Post Saver Type	Ex Ante Saver Type	Number of Accounts	Percentage of Accounts
Negative	Negative	795	40%
Negative	Positive	88	4%
Positive	Negative	591	29%
Positive	Positive	538	27%

13.4.6PROCESS FINDINGS

13.4.6.1 Staff and Implementer Interviews

The following section summarizes the key findings from in-depth interviews with two ENO program staff, and two APTIM staff; ENO staff participated in one interview and APTIM staff participated in a second interview. These in-depth interviews aimed to learn more about the Peak Time Rebate Pilot program design and operations, and the successes and challenges experienced during PY13. Interviews lasted approximately 60 minutes and were conducted using the Microsoft Teams platform. The evaluators recorded all interviews with participant permission. The following narrative summarizes these interviews.

13.4.6.2 Program Description and Implementation

The Peak Time Rebate program was originally designed to be part of Entergy New Orleans' larger behavioral program, however in PY13 the program continued to operate as its own pilot. The pilot targets residential customers with high energy usage and encourages them to use less energy during peak events. Participants receive three emails in advance of an event; emails include tips on how to reduce energy. The pilot launched in mid-July and ran through September. Participants receive rebates based on their participation in the events.

As of the time of the interview in August 2023, about 2,000 customers had enrolled in the program. This pilot was a result of Entergy New Orleans' efforts to expand its demand response offerings.

13.5 Data Tracking Review

The Evaluators were able to perform the analysis as planned once advanced metering infrastructure (AMI) data was provided. The Evaluators found that roughly 93% of participants had AMI data during the evaluation period. ENO reported that this occurred due to participants with inactive accounts. All participants in the participant data that were not present in the AMI data were removed from the analysis when extrapolating kW reduction impacts.

13.6 Key Findings and Conclusions

The following summarizes the key findings and conclusions from the PY13 evaluation.

- **The PTR pilot achieved 28% of its *ex-post* demand reduction (kW) target.**
- **The PTR pilot was fully subscribed in PY13.**
- **7% of BYOT participants listed in the tracking data were missing AMI data and assumed inactive accounts.** The Evaluators found that 93% of participants had AMI data during the evaluation period. The remaining were missing from the project data provided to the Evaluators. The likely explanation is that customers missing AMI data were inactive accounts.
- **21% of PTR participants had cross participation with the EasyCool BYOT program.** The Evaluators adjusted ex-post savings for cross participants with the EasyCool BYOT program.
- **25% of participants showing curtailment with ex post baselines did not receive incentive payments** due to ex ante baseline models being too low. Sixty-six percent of the time, the saver type was the same for ex ante versus ex post classifications. Four percent of the time, the ex-ante saver type was positive while the ex-post saver type was negative. In addition, 29% of the time, the ex-post saver type was positive, and the ex-ante saver type was negative.

13.7 Recommendations

The Evaluators have the following recommendations after completing the PY13 evaluation.

- **Demand response event start, and end times should be the same for customers with cross participation** (e.g., customers participating in both BYOT and PTR) to accurately measure savings impacts. The offset adjustment hour used in some baseline models is adversely impacted (i.e., pushed further from the event time) if events in one program begin prior to events in another program. This is especially true for the BYOT program which has pre-cooling that already pushes the offset adjustment hour back one hour. Furthermore, because reductions during events are often higher at the start of events, adjusting reductions for interactive effects from cross participation is hampered because cross participants are being measured during different time intervals than participants without dual enrollments. In addition, if an event ends earlier for one program and later for another program, the snapback from the first program will impact the ability to measure savings in the other program during hours when snapback overlaps with the ongoing event.
- **Demand response events should begin and end on the hour if hourly interval AMI data is provided.** If demand response events are called on the half hour, then 30-minute interval data should be provided, with an interval measuring usage aggregated at the end of the interval (e.g., 4:30 PM represents usage from 4 PM to 4:30 PM). This will ensure that the complete duration of the event can be used for measuring reductions.
- **Interval AMI data should be aggregated to hourly based on the hour ending datetime** and should not aggregate usage across more than one hour. For example, a datetime ending at 4 PM should represent usage from 3 PM to 4 PM and not usage from 4 PM to 5 PM, or 3:45 PM to 4:45 PM.
- **Implementers of demand response programs with cross participants should consider the number of demand response events that are called** across all programs in that sector (e.g., residential DR programs). While this was not an issue in PY13 with 13 events called across all residential programs, if

too many events are called in future program years, this will adversely impact the number of proxy days available for testing baseline models. The Evaluators typically utilize 8 proxy days for residential programs. In PY13, there were 14 proxy days available; therefore, if an additional 7 events were called in PY13 for a total of 20 events, this would have reduced the number of available proxy days by one. One way to minimize this potential problem is to ensure that events for residential DR programs are called on the same dates.

- **Utilize the MISO WSA baseline model to estimate kWh savings** for customers and for defining saver types to avoid underestimating program impacts.

14 RESIDENTIAL BATTERY PILOT

14.1 Summary

The tables below report *ex ante* gross, *ex post* gross, *ex post* net energy savings (kWh) (both annual and lifetime), demand reductions (kW), participation, incentive spend, and *ex post* net NEBs, by measure, where applicable.

TABLE 14-1 PY13 RESIDENTIAL BATTERY PILOT ENERGY SAVINGS (KWH)

Measure	*Ex ante* Gross Savings (kWh)	Realization Rate (kWh)	*Ex post* Gross Savings (kWh)	NTG	*Ex post* Net Savings (kWh)
BESS pilot	0	N/A	0	N/A	0
Total	**0**	**N/A**	**0**	**N/A**	**0**

Sums may differ due to rounding.

TABLE 14-2 PY13 RESIDENTIAL BATTERY PILOT DEMAND REDUCTIONS (KW)

Measure	*Ex ante* Gross Demand (kW)	Realization Rate (kW)	*Ex post* Gross Demand (kW)	NTG	*Ex post* Net Demand (kW)
BESS pilot	86.21	N/A	80.27	100%	80.27
Total	**86.21**	**N/A**	**80.27**	**100%**	**80.27**

Sums may differ due to rounding.

TABLE 14-3 PY13 RESIDENTIAL BATTERY PILOT LIFETIME SAVINGS SUMMARY

Measure	EUL	*Ex post* Gross Lifetime Energy Savings (kWh)	*Ex post* Net Lifetime Energy Savings (kWh)
BESS pilot	1	0	0
Total	**1**	**0**	**0**

Sums may differ due to rounding.

TABLE 14-4 PY13 RESIDENTIAL BATTERY PILOT PARTICIPATION AND INCENTIVE SUMMARY

Measure	Participation (Count of Measures)	Incentive Spend ($)
BESS pilot	17	$8,725.00
Total	**17**	**$8,725.00**

Sums may differ due to rounding.

TABLE 14-5 PY13 RESIDENTIAL BATTERY PILOT NEB SUMMARY

Measure	*Ex post* Net ARCs ($)	*Ex post* Net Water Savings (gallons)	*Ex post* Net Avoided Arrearages
BESS pilot	$0	0	$0
Total	**$0**	**0**	**$0**

Sums may differ due to rounding.

14.2 Program Description

The residential Battery Energy Storage System (BESS) pilot offering allowed customers to earn an incentive for enrollment and by participating in peak demand events. During these events, Entergy New Orleans, LLC (ENO) accessed stored energy from a home battery system to help provide more reliable power to the grid. The program allowed customers the ability to opt out without penalties. Participation was free with an eligible battery system. The program was limited to the first 30 customers who enrolled and met system qualifications. Customers qualified if they had a compatible solar photovoltaic system-connected BESS.

Customers received a one-time enrollment incentive of $300 and annual participation incentive of up to $250 based on the ratio of actual participation in up to 8 peak demand events.

The program was first introduced in Program Year 13 (PY13), or 2023.

14.3 EM&V Methodology

The Evaluators employed the following approaches to complete impact evaluation activities for the program.

- Method 1: MISO Calculated Baseline using Interval (AMI) Data
- Method 2: Comparison of Battery Discharge Amounts on Event and Baseline Days Using Sampled Telemetry Data

The first approach allowed the Evaluators to estimate peak demand impacts from batteries discharged during demand response events because the AMI data contained all imported and exported kWh values and included kWh from battery discharge to the grid.

A list of advantages and disadvantages for each method is shown in the table below.

TABLE 14-6 EMV METHOD ADVANTAGES AND DISADVANTAGES

Method	Advantages	Disadvantages
1) Interval (AMI) Data	▪ Accounts for any potential behavioral changes due to the demand response events. ▪ Utilizes a census of demand response event days and times.	▪ Missing interval data for one customer. ▪ Potentially introduces noise from consumption and solar generation unrelated to battery discharge. ▪ Small Pilot size of 17 customers makes assigning the correct MISO baseline more difficult due to greater usage variation.
2) Telemetry Data from Portal	▪ Does not introduce noise from unrelated solar generation and consumption data into the estimates.	▪ Sampling telemetry data introduces some uncertainty by not accounting for all demand response event days and time. ▪ Does not account for potential behavioral changes due to the demand response events.

For Method 1, the Evaluator followed the Calculated Baseline approach outlined in the Midcontinent Independent System Operator, Inc. (MISO) Business Practices Manual (BPM)[15]. The following impact evaluation steps were taken to determine the suitability of the MISO Calculated Baseline approach:

- Developed an Unadjusted Consumption (UC) Baseline, a Symmetric Multiplicative Adjustment (SMA) Baseline, and a Weather Sensitive Adjustment (WSA) Baseline for each program participant. Loads were calculated utilizing hourly AMI data.
- Determined days that will serve as proxy days for testing the suitability of the baseline approach. Proxy days represent days like demand response event days in terms of load shape and temperature profiles.
- Estimated bias (uncertainty) and error on proxy days for each model to assess baseline performance. Bias is assessed by examining the average percent error of the baseline predictions relative to the actual usage on proxy days. In a similar manner, error is assessed through various metrics such as Root Mean Squared Error (RRMSE) using baseline predictions and actual usage on proxy days.
- Selected the baseline model with the lowest absolute bias.

14.3.1GROSS IMPACT METHODOLOGIES

For most demand response programs, energy savings are estimated by comparing a participant's load shape during a demand response event with a baseline load shape. This baseline load is assumed to be a good estimate of the counterfactual load—that is, the load that would have manifested had there not been an event called that day. The Evaluators initially believed the interval AMI data would not include kWh amounts from battery discharge to the grid, and this would have prevented solely using AMI data to analyze peak load impacts. However, the Evaluators compared imported and exported kWh values with participant telemetry data provided via the implementer portal and determined that the AMI interval data accounted for kWh from battery discharge to the grid, as well as all kWh imported or exported to the grid (e.g., exported solar kWh, or imported battery charging kWh). Therefore, the Evaluators were successful in utilizing AMI data to estimate peak load impacts and constructed net kWh values for each participant by taking the difference between imported and exported kWh values.

The following equation defines the net kWh utilized to estimate peak load impacts for Method 1.

$$Net\ kWh_{it} = Imported\ kWh_{it} - Exported\ kWh_{it}$$

For Method 2, the Evaluators compared battery discharge amounts on event and baseline days during event hours to determine the peak load reduction. Telemetry data could not be downloaded for the analysis, however, a portal from Enphase was available which provided 15-minute values of battery charge/discharge kW for all participants during the summer. The Evaluators sampled participant discharge data during event hours on event and baseline days to hit 90/10 confidence and precision. Baseline days were selected as the first non-event, non-holiday weekday prior to the peak demand event.

[15] MISO Demand Response Business Practices Manual: BPM-026.

14.3.1.1 Data Sources

Data used for this evaluation include the following:

- 15-minute interval meter data (AMI) for each participant.
- A full schedule of DR program events for each participant, including the date and time of the event and which customers participated in the event.
- Program tracking data that identifies which customers participated in the program.
- An implementer portal with 15-minute charge/discharge kW amounts for each participant during the summer.

14.3.1.2 MISO Calculated Baseline Approach (Customer Baselines)

The following details the general requirements for the MISO Calculated Baseline Approach. The Evaluators developed Customer Baselines (CBLs) in accordance with this approach. For a demand resource, the Consumption Baseline is a profile of hourly demand based on an averaged sample of historical data which may be adjusted for factors that reflect specific, on-the-day conditions, such as temperature.

The default consumption baseline is designed as follows:

- Separate hourly demand profiles for non-holiday weekdays and for weekends/holidays
- The "weekday" hourly profile is based on the average of the ten (10), but not less than five (5), most recent weekdays that are not holidays or other non-standard "event" days
- The "weekend/holiday" hourly profile is based on the average of the four (4), but not less than two (2), most recent weekend days or holidays that are not "event" days
- An "event" day is one during which there was, for the resource in question, a real- time energy or ancillary services dispatch, or a scheduled outage
- The maximum look-back window is limited to 45 days; and
- If the 45-day window contains insufficient days to meet the minimum number of days described above, the profiles are constructed based on the available days within the 45-day window that qualify, supplemented by the largest (MW) matching "event" day(s) values for that resource within that same window as necessary to obtain the minimum number of values.

Adjustment mechanisms to the default Consumption Baseline include:

- Symmetric Multiplicative Adjustment (SMA)
    - Adjusts each baseline hourly value (MW) during the event up or down by the ratio of
    - (a) the sum of hourly demands for the three hours beginning four hours prior to the event and (b) the sum of those same three hourly baseline demands
    - The adjustment is limited to a change in any individual baseline hour of plus or minus 20 percent.
    - If multiple events occur during the same day, the SMA is calculated only for the first event, but applied to all events that day.
- Weather Sensitive Adjustment (WSA)
    - Adjusts each baseline hourly value (MW) up or down by a Weather Adjustment Factor

- The Weather Adjustment Factor is determined by a mathematical relationship derived through a regression analysis that considers the DRR load and historical hourly temperature data.

14.3.1.3 Evaluators MISO Models

The following CBL models were developed for each customer in accordance with MISO protocols.

For a 10-of-10 (or 5-of-5) unadjusted baseline, the Evaluators examine the load data from the most recent ten (or five) non-event, non-holiday weekdays relative to the event day and calculate the mean demand usage values of the five highest load days. This baseline is then adjusted for the SMA and WSA models utilizing the method described in Section 14.3.1.2.

TABLE 14-7 EVALUATORS' MISO CBL MODELS

Model Type	Baseline Days	SMA	WSA
Unadjusted	10-of-10	No	No
SMA-Adjusted	10-of-10	Yes	No
WSA-Adjusted	10-of-10	No	Yes
Unadjusted	5-of-5	No	No
SMA-Adjusted	5-of-5	Yes	No
WSA-Adjusted	5-of-5	No	Yes

14.3.1.4 Baseline and Proxy Day Development

The Evaluators defined proxy days as non-event, non-holiday, non-weekend days which display average temperature (F), maximum temperature (F), and Cooling Degree Days (CDD) that fall within the range of corresponding values seen on demand response event days. The Evaluators used these defined proxy days to determine the ability of CBL models to predict actual usage for each customer.

14.3.2 NET IMPACT METHODOLOGIES

In demand response programs, it is typically assumed that there are neither spillover nor free-ridership effects (customers are not expected to curtail without participating). Although customers can find workarounds to make up for lost productivity due to demand response events, they are compensated only if they reduce their load during the peak demand window, the primary program goal. As such, the net-to-gross ratio for this program is assumed to be 100%.

14.4 Evaluation Findings

The results of the impact evaluation for Method 1 (AMI) and Method 2 (Sampled Telemetry) are provided in the following sections.

A list of demand response event dates and times are shown in the table below.

TABLE 14-8 EVENT DATES AND TIMES

Event Dates	Event Times (CDT)
6/13/2023	1600-1900
6/15/2023	1600-1800
6/29/2023	1600-1800
8/1/2023	1700-1900
8/4/2023	1600-1800
8/8/2023	1600-1800
8/15/2023	1600-1800
8/23/2023	1600-1800
9/27/2023	1600-1800
9/29/2023	1600-1800

14.4.1EM&V METHOD 1 (AMI) IMPACT RESULTS

EM&V Method 1 used interval data and allowed the Evaluators to estimate peak demand impacts from batteries discharged during demand response events because the AMI data contained all imported and exported kWh values. Critically, these values included kWh from battery discharge to the grid. In addition, exported kWh values account for any solar output sent to the grid while imported kWh accounts for recharging batteries after demand response events[16].

Imported kWh values were positive when the customer was receiving energy from the grid, while exported kWh values were positive when the customer was providing kWh to the grid. In general, participants were either importing or exporting during a given interval, such that imported kWh was positive and exported kWh was zero or vice versa, however, because intervals spanned 15 minutes, it was possible for a participant to have positive values for both imported and exported kWh values during a given interval.

[16] All import and export values are in aggregate such that the Evaluators cannot determine individual contributions from consumption, solar generation, or battery charge and discharge.

14.4.1.1 Load Shapes and Model Performance

The figures below provide average load shapes for each program on average proxy days and event days and depict actual kW and baseline kW for the selected baseline model for EM&V Method 1. The figures show that baseline kW is a good match for actual kW during the hours of curtailment on the average proxy day. The Evaluators utilized 64 proxy days due to the small number of participants and the variability of participant loads[17].

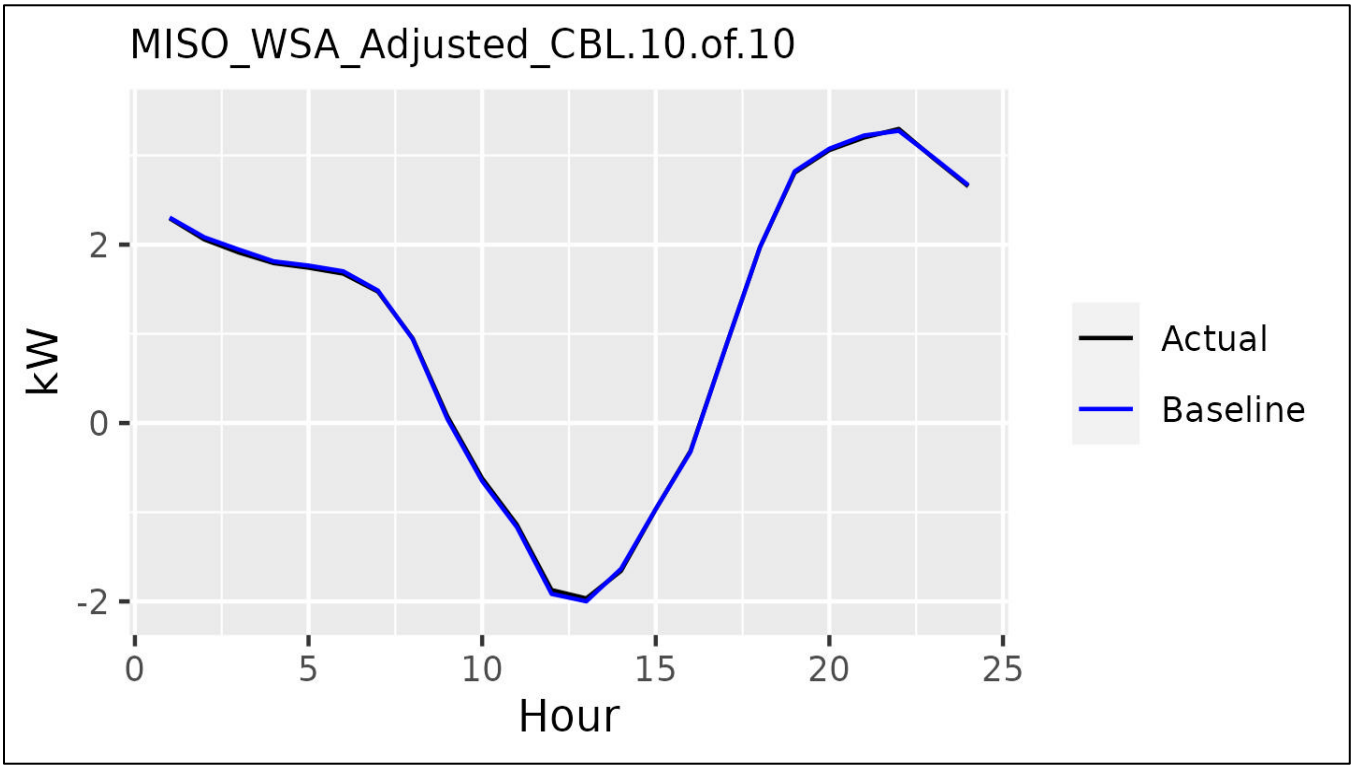


FIGURE 14-1 RESIDENTIAL BATTERY PILOT AVERAGE PROXY DAY LOAD SHAPE

[17] All participants had solar generation which results in more variable net consumption, all else equal. In addition, solar generation lowers net consumption during daylight hours which has an impact on bias calculations by bringing net consumption closer to zero.

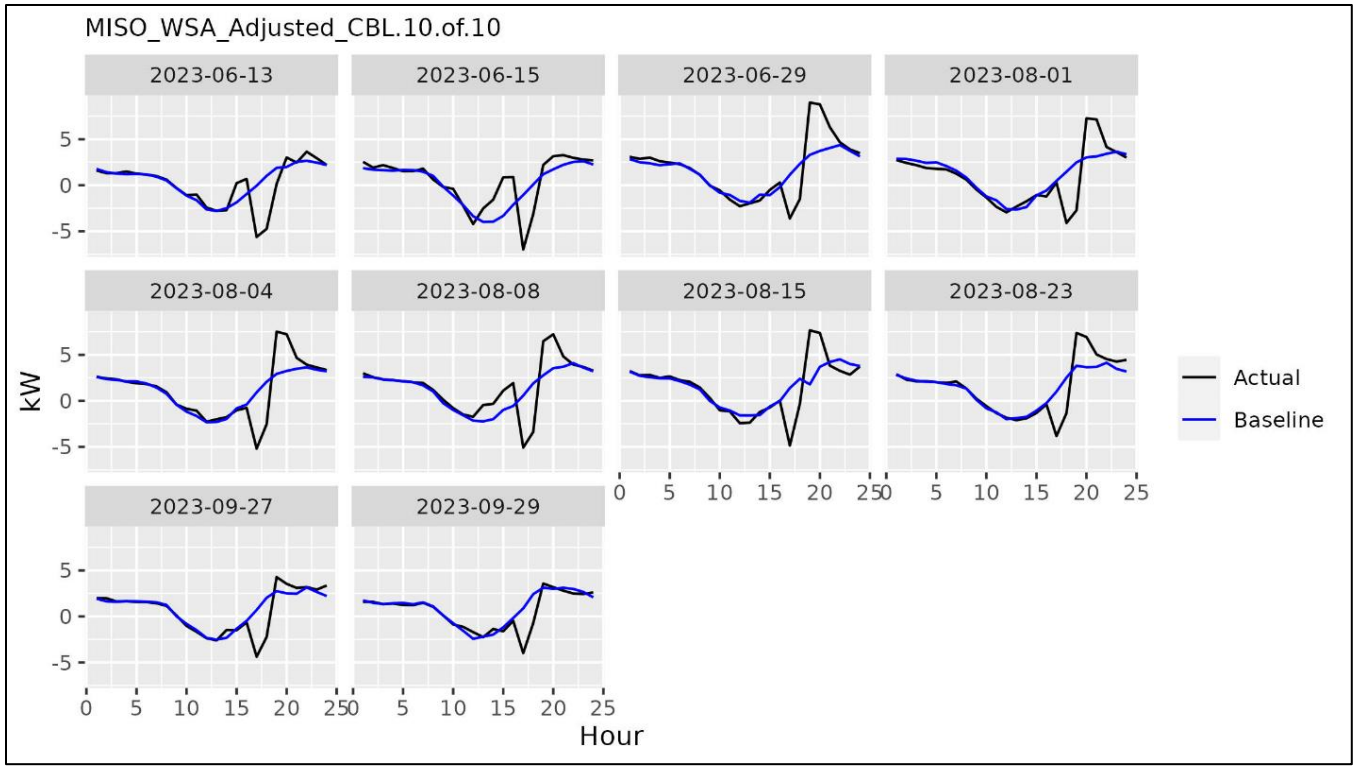


FIGURE 14-2 RESIDENTIAL BATTERY PILOT EVENT DAY LOAD SHAPES

The Evaluators estimated bias and error for the Evaluators MISO models for all participants and when applied on a site-specific basis and selected for the model with the lowest bias. As shown in the table below, the MISO WSA Adjusted CBL 10-of-10 model performed the best and had the lowest bias and error for the Residential Battery Pilot program.

TABLE 14-9 MODEL FIT AND BIAS

Model	Follow MISO Protocols	RRMSE	RMSE	Bias	Selected Model
MISO_WSA_Adjusted_CBL.10.of.10	X	0.015	0.013	0.37%	X
MISO_SMA_Adjusted_CBL.10.of.10	X	0.072	0.059	-0.49%	
MISO_SMA_Adjusted_CBL.5.of.5	X	0.049	0.040	-0.65%	
MISO_Unadjusted_CBL.10.of.10	X	0.017	0.014	0.74%	
MISO_WSA_Adjusted_CBL.5.of.5	X	0.018	0.015	0.79%	
MISO_Unadjusted_CBL.5.of.5	X	0.014	0.011	0.94%	

14.4.1.2 Impact Findings

Using results from the CBLs, the Evaluators calculated the PY13 kW reduction for EM&V Method 1. Results are shown below in the table below.

TABLE 14-10 TOTAL GROSS RESIDENTIAL BATTERY PILOT DEMAND REDUCTIONS

Ex Ante Average Savings per Event per Participant	Number of Participants	*Ex Ante* Total Program kW Reduction	Average Savings per Event per Participant (kW)	Total Program kW Reduction	Realization Rate
5.071	17	86.21	4.722	80.27	93%

14.4.2 EM&V METHOD 2 (SAMPLED TELEMETRY) IMPACT RESULTS

For Method 2, the implementer portal contained telemetry data for all participants from which the Evaluators sampled discharge values. The values from the portal were not available to download which prevented a census of participants and event days from being utilized. However, the portal provided individual participant 15-minute interval data with separate kW values for battery discharge, battery charging, and other values related to solar generation and consumption. The Evaluators sampled the portal telemetry discharge data on event and baseline days to hit 7% precision with 90% confidence.

14.4.2.1 Impact Findings

Using the sampled telemetry data and EM&V Method 2, the Evaluators found a realization rate of 93%. The Evaluators calculated the PY13 kW reduction by applying the realization rate to the average ex-ante savings per event per participant (kW). Results are shown below in the table below.

TABLE 14-11 TOTAL GROSS RESIDENTIAL BATTERY PILOT DEMAND REDUCTIONS

Ex Ante Average Savings per Event per Participant	Number of Participants	*Ex Ante* Total Program kW Reduction	Average Savings per Event per Participant (kW)	Total Program kW Reduction	Realization Rate
5.071	17	86.21	4.716	80.17	93%

14.4.3 GROSS IMPACT FINDINGS

Using results from EM&V Method 1, the Evaluators calculated the PY13 kW reduction. Results are shown below in the table below.

TABLE 14-12 TOTAL GROSS RESIDENTIAL BATTERY PILOT DEMAND REDUCTIONS

Ex Ante Average Savings per Event per Participant	Number of Participants	*Ex Ante* Total Program kW Reduction	Average Savings per Event per Participant (kW)	Total Program kW Reduction	Realization Rate
5.071	17	86.21	4.722	80.27	93%

The overall verified kW reduction is 80.27 kW.

14.4.4 NET IMPACT FINDINGS

For demand response programs, net savings equals gross savings.

TABLE 14-13 TOTAL RESIDENTIAL BATTERY PILOT NET DEMAND REDUCTION RESULTS

Gross kW Reduction	Net-to-Gross Ratio	Net Demand Reduction
80.27	100%	80.27

14.4.5 NON ENERGY BENEFITS FINDINGS

There were no NEBs identified in this program.

14.4.6 PROCESS FINDINGS

14.4.6.1 Staff and Implementer Interviews

The following section summarizes the key findings from in-depth interviews with two ENO program staff, and two Honeywell staff; ENO staff participated in one interview and Honeywell staff participated in a second interview. These in-depth interviews aimed to learn more about the Residential Battery Pilot program design and operations, and the successes and challenges experienced during PY13. Interviews lasted approximately 60 minutes and were conducted using the Microsoft Teams platform. The evaluators recorded all interviews with participant permission. The following narrative summarizes these interviews.

14.4.6.1.1 *Program Description and Implementation*

PY13 marked the first year of the Residential Battery Pilot Program. The program targets existing, residential interconnected battery customers. Typically, customers with batteries use solar energy to power their batteries which in turn powers their home and thus allows them to minimize their energy usage from Entergy New Orleans. Interconnected batteries are external batteries that Entergy New Orleans has access to and can turn off during grid emergencies. The purpose of this pilot is to assess the feasibility of a demand response related battery program. During a demand response event, ENO staff can switch customers with interconnected batteries to use their batteries to fuel their home rather than energy from the grid. The hope is that this switch will offset some demand and alleviate pressure on the grid. Additionally, if the battery has the capacity, Entergy New Orleans can use some of the battery's energy to help power the grid during a peak event.

The pilot aims to enroll 30 customers and track participation and opt outs. Customers receive a $50 incentive for participating in the pilot.

14.5 Data Tracking Review

The Evaluators reviewed the advanced metering infrastructure (AMI) data that was provided and found that 16 out of 17 participants had complete AMI data for the summer demand response period. One participant did not appear in the AMI data.

The Evaluators determined that the AMI data was sufficient to analyze program impacts because it contained all imported and exported kWh values, including from battery discharge to the grid, solar generation provided to the grid, imported energy from the grid, etc...

Telemetry battery discharge data was not provided or available for download which prevented analyzing discharge data for all participants on all demand response events. However, the Evaluators were provided with an implementer portal that showed 15-minute usage kW values which permitted sampling of telemetry data.

14.6 Key Findings and Recommendations

The following summarizes the key findings and conclusions from the PY13 evaluation.

- Achievement of Demand Reduction Target: The program achieved 28% of its *ex post* demand reduction target in PY13. This indicates the program's effectiveness in reducing peak electricity demand during targeted periods, albeit below the set target.
- Program Subscription: The program was fully subscribed in PY13, signifying strong interest and participation from eligible customers. Full subscription indicates that the program reached its intended capacity for participant enrollment.
- Missing AMI Data for BYOT Participants: Approximately seven percent of BYOT participants listed in the tracking data were missing Advanced Metering Infrastructure (AMI) data, and their accounts were assumed to be inactive. However, during the evaluation period, 93% of participants had AMI data available. The discrepancy in data availability suggests that the participants with missing AMI data may have been inactive accounts.
- Cross Participation with EasyCool BYOT Program: Around 21% of PTR participants also participated in the EasyCool BYOT program. This indicates overlapping participation among customers enrolled in both programs. Adjustments were made to account for the savings generated by cross participants in both programs.
- Incentive Payments and Baseline Models: A significant proportion (25%) of participants showing curtailment with ex post baselines did not receive incentive payments due to ex ante baseline models being too low. This discrepancy highlights challenges in accurately predicting energy savings using baseline models. Moreover, the comparison between ex ante and ex post saver types revealed variations, with some instances showing divergent classifications between the two evaluation approaches.

The Evaluators have the following recommendations after completing the PY13 evaluation.

- Alignment of Demand Response Event Times: It is recommended to synchronize the start and end times of demand response events for customers participating in multiple programs (e.g., BYOT and PTR). Misalignment of event times can distort the accuracy of savings measurements, particularly impacting baseline models. For instance, if events in one program begin prior to events in another program, it can push the offset adjustment hour further from the event time, complicating measurements of interactive effects from cross participation. Additionally, discrepancies in event end times across programs can impede the measurement of savings during overlapping periods.
- Standardization of Event Timing: Demand response events should ideally commence and conclude on the hour, especially when hourly interval AMI data is available. If events are called on the half hour, 30-minute interval data should be provided to ensure precise measurement of reductions. This standardization facilitates the comprehensive utilization of event durations for accurately assessing energy savings.
- Aggregation of Interval AMI Data: Interval AMI data should be aggregated to the hourly level based on the hour-ending datetime, without spanning across multiple hours. For instance, usage data with a

datetime ending at 4 PM should represent usage from 3 PM to 4 PM. This ensures consistency and accuracy in usage measurement, enhancing the reliability of baseline models and savings estimation.

- Consideration of DR Event Frequency: Implementers of demand response programs with cross participants should monitor the frequency of demand response events across all programs within a sector (e.g., residential DR programs). Excessive event scheduling can reduce the availability of proxy days for testing baseline models, impacting the accuracy of savings estimation. To mitigate this issue, events for residential DR programs should be scheduled on the same dates to optimize the use of proxy days.
- Utilization of MISO WSA Baseline Model: It is recommended to utilize the MISO WSA baseline model for estimating energy savings and defining saver types. This model helps avoid underestimating program impacts by providing robust estimates of energy savings for customers. Leveraging this baseline model enhances the accuracy of savings calculations and ensures a comprehensive evaluation of program effectiveness.

15 ELECTRIC VEHICLE PILOT

15.1 Summary

The tables below report *ex ante* gross, *ex post* gross, *ex post* net energy savings (kWh) (both annual and lifetime), demand reductions (kW), participation, incentive spend, and *ex post* net NEBs, by measure, where applicable.

TABLE 15-1 PY13 ELECTRIC VEHICLE PILOT ENERGY SAVINGS (KWH)

Measure	*Ex ante* Gross Savings (kWh)	Realization Rate (kWh)	*Ex post* Gross Savings (kWh)	NTG	*Ex post* Net Savings (kWh)
EV Charging	0	N/A	0	N/A	0
Total	**0**	**N/A**	**0**	**N/A**	**0**

Sums may differ due to rounding.

TABLE 15-2 PY13 ELECTRIC VEHICLE PILOT DEMAND REDUCTIONS (KW)

Measure	*Ex ante* Gross Demand (kW)	Realization Rate (kW)	*Ex post* Gross Demand (kW)	NTG	*Ex post* Net Demand (kW)
EV Charging	N/A	N/A	49.42	100%	49.42
Total	**N/A**	**N/A**	**49.42**	**100%**	**49.42**

Sums may differ due to rounding.

TABLE 15-3 PY13 ELECTRIC VEHICLE PILOT LIFETIME SAVINGS SUMMARY

Measure	EUL	*Ex post* Gross Lifetime Energy Savings (kWh)	*Ex post* Net Lifetime Energy Savings (kWh)
EV Charging	1	0	0
Total	**1**	**0**	**0**

Sums may differ due to rounding.

TABLE 15-4 PY13 ELECTRIC VEHICLE PILOT PARTICIPATION AND INCENTIVE SUMMARY

Measure	Participation (Count of Measures)	Incentive Spend ($)
EV Charging	94	$3,458.00
Total	**94**	**$3,458.00**

Sums may differ due to rounding.

TABLE 15-5 PY13 ELECTRIC VEHICLE PILOT NEB SUMMARY

Measure	*Ex post* Net ARCs ($)	*Ex post* Net Water Savings (gallons)	*Ex post* Net Avoided Arrearages
EV Charging	$0	0	$0
Total	**$0**	**0**	**$0**

Sums may differ due to rounding.

15.2 Program Description

PY13 marked the first year of the "Bring Your Own Charger" (BYOC) program. This demand response pilot seeks to shift EV charging load to off-peak hours using a predetermined charging schedule. Sagewell uses software to identify potential EV chargers and invites them to participate in the program. Customers receive a monthly incentive for participating in the program. To qualify, customers must charge their car during off-peak hours at least three times a month and cannot override the charging schedule more than four times a month.

The program seeks to enroll 350 cars over the three-year pilot. Target audience is single-family home residents with level-2 chargers.

15.2.1 PROGRAM CHANGES

PY13 was the first year for the PTR offering.

15.2.2 TIMING OF PROJECTS

All enrollments occurred from July to December 2023.

15.2.3 TRADE ALLIES

There were no reported trade allies in this program.

15.2.4 GOAL ACHIEVEMENT

The table below summarizes the programs' performance against goal.

TABLE 15-6 EV PILOT PERFORMANCE TOWARDS GOAL

Ex post Gross Energy Savings (kWh) Goal	% to kWh Goal	*Ex post* Gross Energy Savings (kWh)	*Ex post* Gross Savings (kW) Target	% to kW Target	*Ex post* Gross Savings (kW)
0	N/A	0	525.00	9%	49.42

15.3 EM&V Methodology

15.3.1 GROSS IMPACT METHODOLOGIES

In the evaluation of demand response programs, energy savings are estimated by comparing a participant's load shape with a baseline load shape. This baseline load is assumed to be a good estimate of the counterfactual load—that is, the load that would have manifested in the absence of the program. The Evaluators created the baseline load from a matched control group of customers with electric vehicles.

15.3.1.1 Data Collection

Data used for this evaluation include the following:

- 15-minute interval meter data (AMI) for each participant.
- A full schedule of DR program event dates and times for all DR programs (DR event dates were excluded).
- Program tracking data that identifies which customers participated in the program.

- Program tracking that identifies potential control customers.

15.3.1.2 Cohort and Study Period Definitions

The following definitions were utilized for the study period:

- Pre-period start date: 06/1/2023.
- Pre-period end date: 7/15/2023.
- Post-period: September 2023.
- Dates when DR events were called were excluded from the pre- and post-periods because dual enrollment in other DR programs could impact usage and create biased impact estimates if treatment and control customers enroll or opt-out in other DR programs at different rates. Two dates were excluded from the post-period, while five dates were excluded from the pre-period.

The Evaluators restricted the study period to the summer months to measure peak kW reductions for the program. In addition, the program was expected to only shift load and not result in energy savings, therefore, there was not a need to extend the study period beyond the summer months. Furthermore, keeping the study period close to the enrollment dates of the participant would help ensure that customers had EV charging in the pre- and post-periods.

The study cohort was created using the following requirements:

- Participant enrolled in the program in 2023.
- The participant enrolled in the program after the pre-period end date (see above) and before the post-period start date. This allowed for the accumulation of participants between July 16, 2023, and August 31, 2023.
- The participant showed electric vehicle charging throughout 2023 (identified by Sagewell).
- Potential control group customers were identified from the following sources: 1) Customers receiving the Electric Vehicle Supply Equipment (EVSE) rebate with no enrollment in the EV Pilot, 2) customers with the EVSE rebate and either incomplete enrollment in the EV Pilot or enrollment in the EV Pilot in 2024 (i.e., after PY13), and 3) customers identified by Sagewell as having an EV by observing EV charging patterns in their interval meter AMI data.
- Treatment and potential control customer AMI data is 99% complete during the study period.

15.3.1.3 Control Group Creation

For each treatment premise in the participant population, a corresponding control group premise was selected such that the pre-period consumption patterns are as closely matching as possible.

The Evaluators utilized the following matching methods to develop control groups:

- Method 1: Propensity Score Matching (PSM) using pre-period weekday and weekend hourly load shapes. PSM utilizes a logistic function to predict the probability of belonging to the treatment group. Customers were matched using the nearest neighbor algorithm, with 1 treatment customer for 3 control customers (e.g., a matching ratio of 3) and matching with replacement of control customers. Customers were exactly matched based on low/high total consumption and low/high maximum demand during the pre-period.

- Method 2: Euclidian distance matching using each customer's frequency distribution of hourly pre-period energy usage (kWh), selecting the control customer with the minimum distance.
- Method 3: Vector angle distance matching using each customer's frequency distribution of hourly pre-period energy usage (kWh), selecting the control customer with the minimum distance.

With the PSM approach (Method 1), a propensity score is estimated for treatment customers and a group of customers who did not receive the treatment using a logit model. Two additional matching strategies were explored based on industry best practices[18] historically utilized by the Evaluators. These approaches reduced meter data for evaluated premises to a normalized histogram curve that describes a premise's normal usage pattern in a single vector of values; an example is shown in

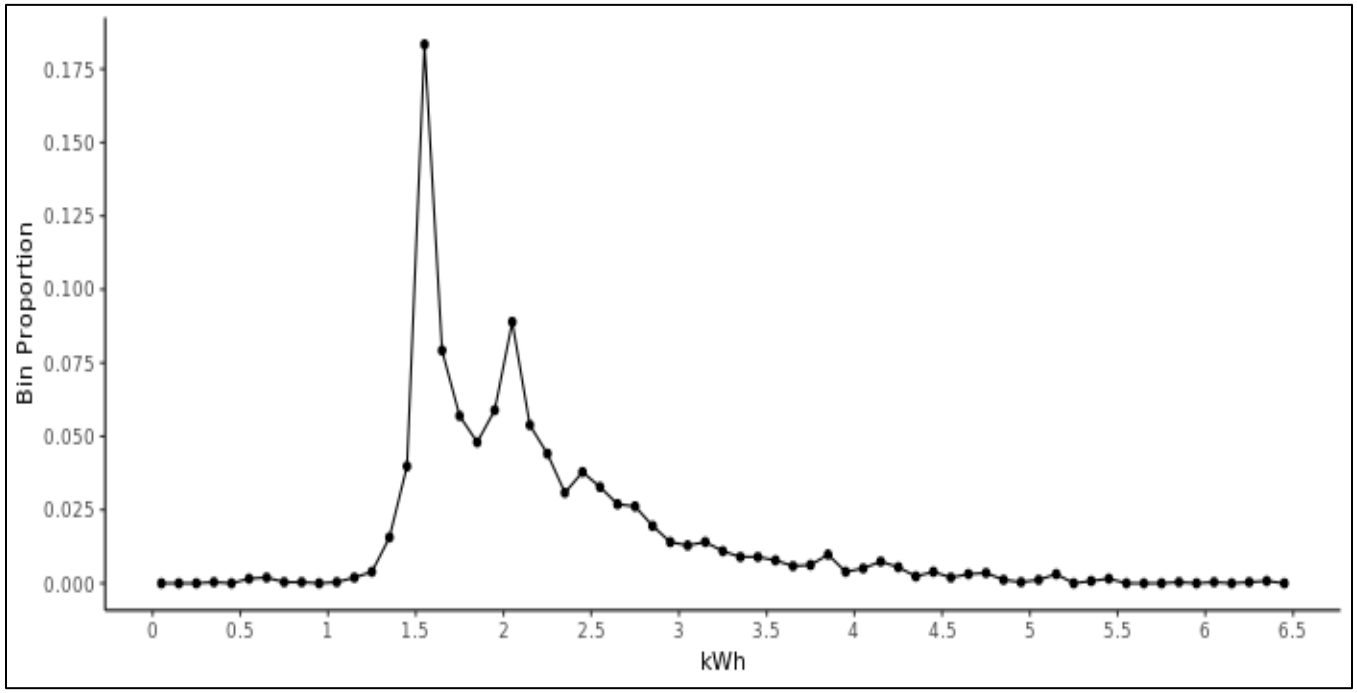


Figure 15-1. This approach has been found to optimize retention of both general consumption patterns and magnitudes in a condensed, easily comparable form. The Euclidean distance, the "ordinary" straight-line distance between two points in space denoted as *d* in the first equation below, for each set of premise values was calculated to determine matches by finding the treatment-control pair that had a minimum value *d* relative to other possible control premises. The bold letters, **q** and **p**, denote vectors where each represents a single premises' summarized consumption data; non-bold cases with number subscripts indicate a specific index position in each vector.

[18] McBride, C. *Finding the Perfect Baseline: Advanced Time Series Control Group Matching Strategies on Energy Consumption*. IEPEC 2019.

EQUATION 15-1: EUCLIDEAN DISTANCE MATCHING

$$d(\mathbf{q},\mathbf{p}) = \sqrt{\sum_{i=1}^{n}(q_i - p_i)^2} = \sqrt{(q_1 - p_1)^2 + (q_2 - p_2)^2 + \cdots + (q_n - p_n)^2}$$

EQUATION 2: VECTOR ANGLE DISTANCE MATCHING

$$\theta(\mathbf{q},\mathbf{p}) = cos^{-1}\left(\frac{\sum_{i=1}^{n} q_i * p_i}{\sqrt{\sum_{i=1}^{n} q_i * q_i} * \sqrt{\sum_{i=1}^{n} p_i * p_i}}\right)$$

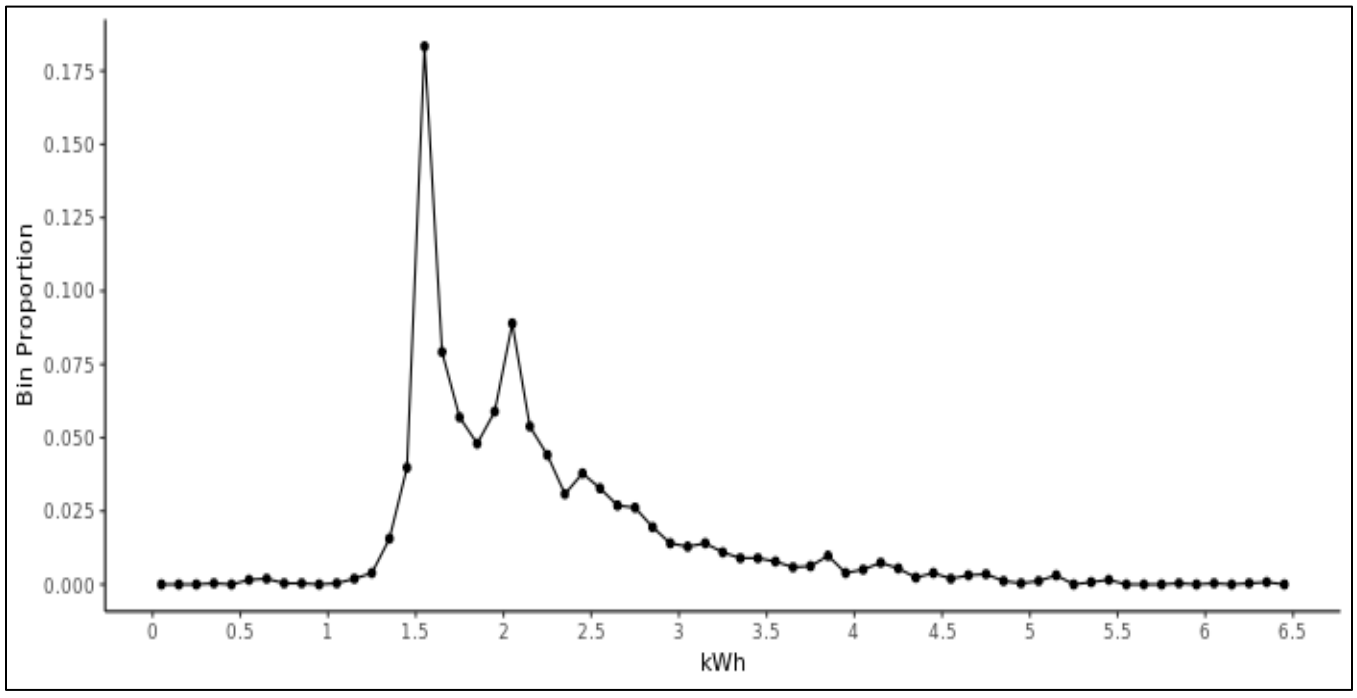


FIGURE 15-1: AVERAGE HOURLY ENERGY NORMALIZED HISTOGRAM BIN PROPORTIONS

To measure remaining error and bias after matching, the Evaluators utilized the Coefficient of Variation of Root Mean Squared Error (CV(RMSE)) to measure error and Normalized Mean Bias Error (NMBE) to measure bias[19].

15.3.1.4 Savings Calculations and Extrapolation

The Evaluators expected no energy savings (kWh) for the Electric Vehicle Pilot because the program was designed to shift EV charging away from the peak period toward off-peak hours.

[19] ASHRAE Guideline 14-2014. Measurement of Energy, Demand, and Water Savings.

The Evaluators calculated peak demand reductions (kW) by comparing usage in the post-period between matched control group customers and program participants (treatment customers). The post-period was defined as the period after which a large proportion of customers had enrolled in the program.

The peak demand reduction per participant (kW) was estimated during ENO's peak demand window according to the equation below.

$$Peak\ Demand\ Reduction\ (kW)\ per\ Participant = (\sum_{h=1}^{n} Average\ Control\ Customer\ kW_h - Average\ Treatment\ Customer\ kW_h) / (\#\ of\ Peak\ Hours)$$

Where,

h = an indicator for peak hour h;

$Average\ Control\ Customer\ kW_h$ = average kW during peak hour h across all matched control customers during the post-period;

$Average\ Treatment\ Customer\ kW_h$ = average kW during peak hour h across all treatment (participant) customers during the post-period;

Because electric vehicle loads were not weather sensitive in the selected post-period, the entire post-period was utilized when averaging hourly control and treatment customer usage.

The Average Peak Demand Reduction (kW) was extrapolated to the total number of participants that enrolled in the Pilot in PY13.

15.3.1.5 Cross Program Participation Adjustments

The Evaluators expected cross program participation with other DR programs for the EV Pilot. However, since the EV Pilot does not call DR events and instead causes participants to shift their EV charging away from the peak on any day of the week, no cross-program participation adjustments were made. This was determined by noting that MISO baselines for event-based DR programs would include any load shifting from the EV Pilot for customers with dual enrollment, because MISO baselines are based on prior-day averaging. In addition, the Evaluators removed all DR event days from other DR programs from the study period for the EV Pilot to avoid double counting or creating bias in the EV Pilot impact estimates.

15.3.2 NET IMPACT METHODOLOGIES

In demand response programs, it is typically assumed that there are neither spillover nor free-ridership effects (customers are not expected to curtail without participating). As such, the net-to-gross ratio for this program is assumed to be 100%.

15.4 Evaluation Findings

15.4.1 MATCHED CONTROL GROUP FINDINGS

Table 15-7 details the treatment and control cohort sizes before and after matching.

TABLE 15-7 COHORT SIZES BEFORE AND AFTER MATCHING

Matching Method	Number of Treatment Customers	Number of Treatment Customers w/ EV Charging Throughout 2023	Number of Potential Control Customers	Number of Matched Treatment Customers	Number of Matched Control Customers
Method 1 (PSM)	94	63	273	42	82
Method 2 (Euclidian)	94	63	273	53	108
Method 3 (Vector Angle)	94	63	273	53	108

0.64).

Table 15-8 compares the matching methods using several statistical methods applied to the pre-period data after matching. The Evaluators selected Method 1 (PSM) as the most suitable matching method because it showed low error (RRMSE) and the lowest bias (NMBE). It also showed no statistically significant difference between treatment and control average pre-period usage after matching (p-value = 0.64).

TABLE 15-8 MATCHING METHOD COMPARISON

Matching Method	Average Treatment Pre-Period Usage (kW), After Matching	Average Control Pre-Period Usage (kW), After Matching	P-Value (Welch's T-Test)	RRMSE	NMBE
Method 1 (PSM)	3.02	3.00	0.64	0.122	0.67%
Method 2 (Euclidian)	3.11	3.28	0.00	0.132	-5.51%
Method 3 (Vector Angle)	3.11	3.14	0.54	0.114	-0.90%

The figures below provide average pre- and post-period hourly usage before and after matching. As shown in

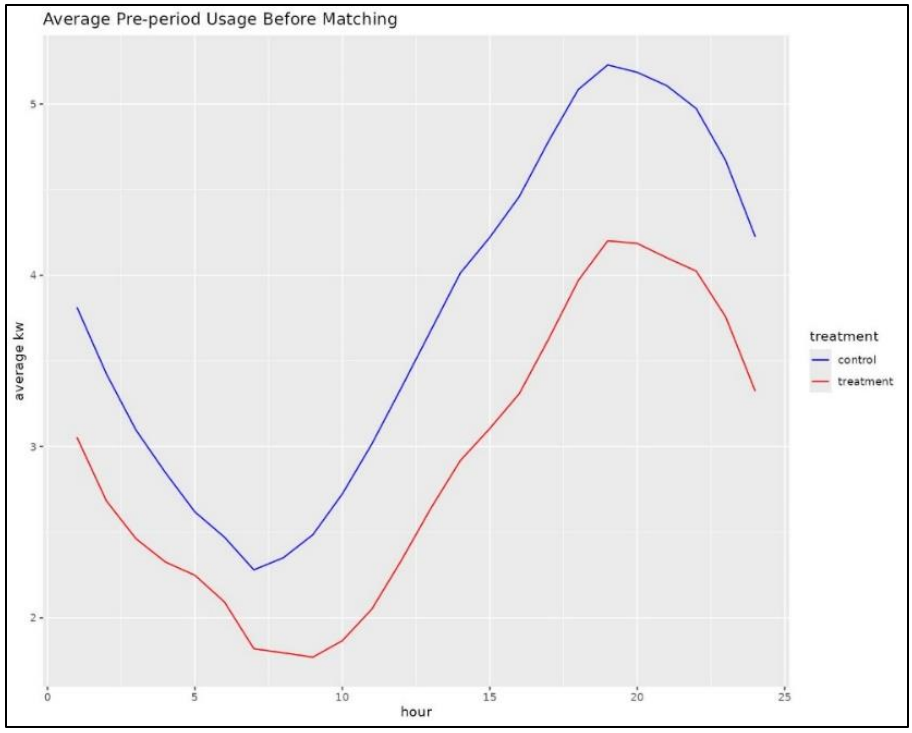


Figure 15-2, there are large differences between the control and treatment groups before matching, while in

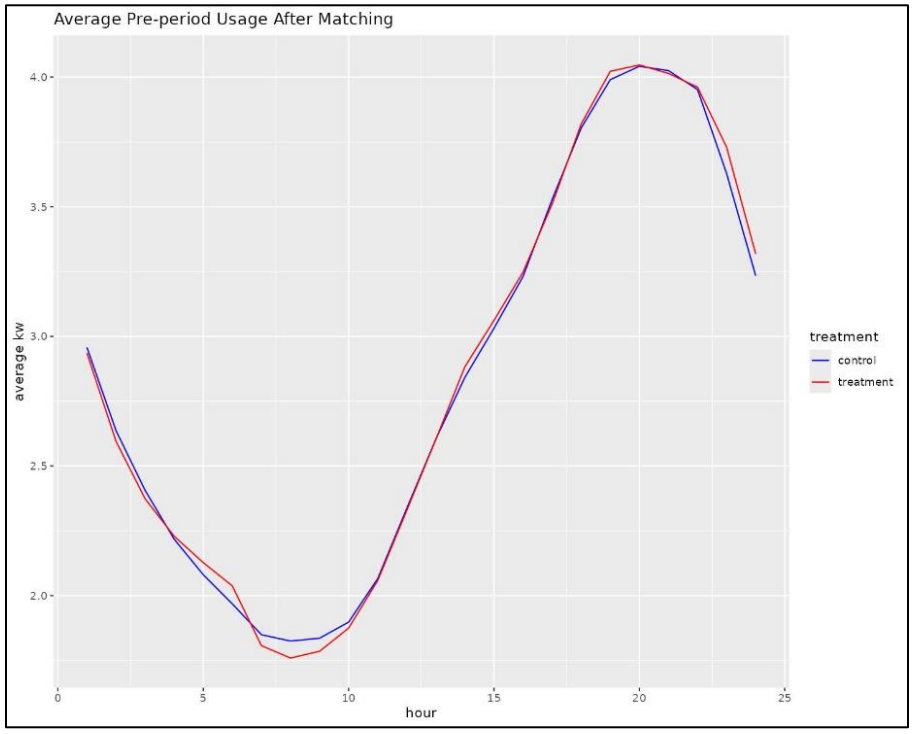


Figure 15-3, there is little difference in pre-period usage remaining after matching.

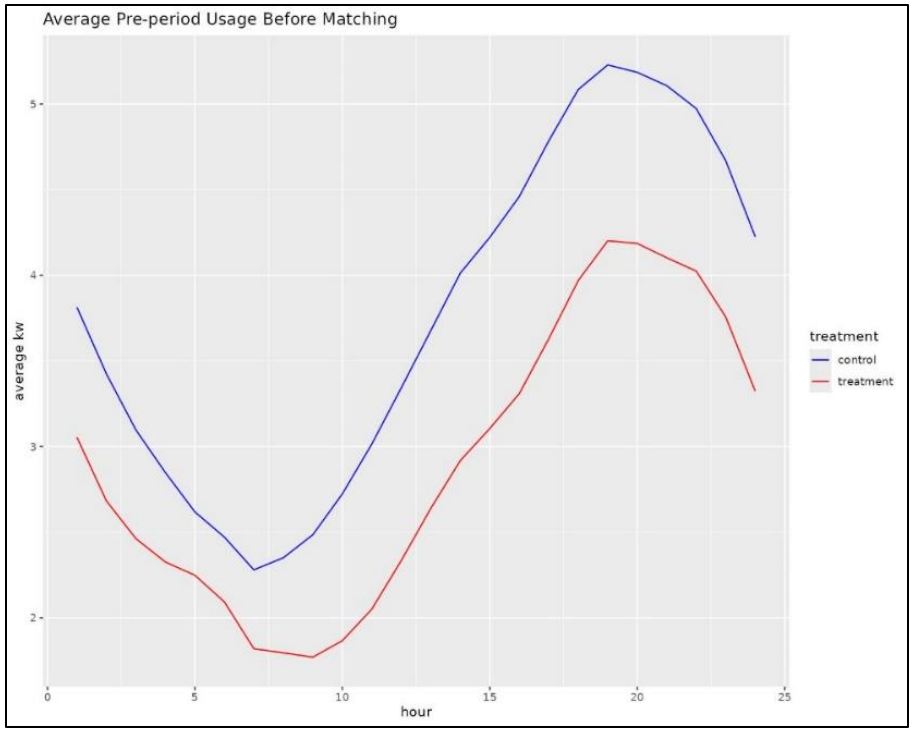


FIGURE 15-2 AVERAGE PRE-PERIOD USAGE BEFORE MATCHING

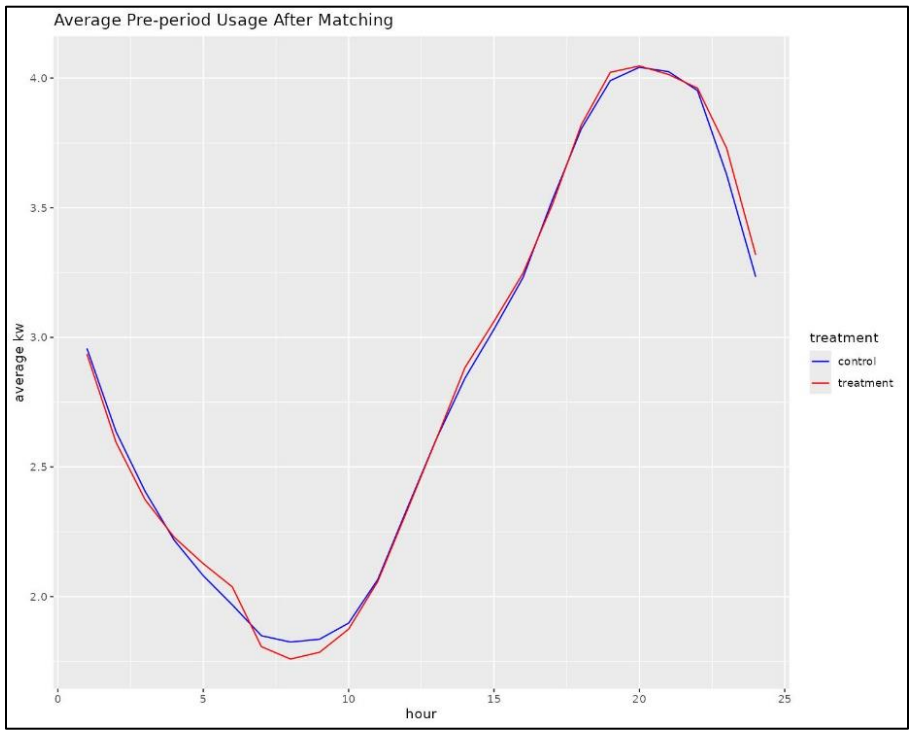


FIGURE 15-3 AVERAGE PRE-PERIOD USAGE AFTER MATCHING

15.4.2 GROSS IMPACT FINDINGS

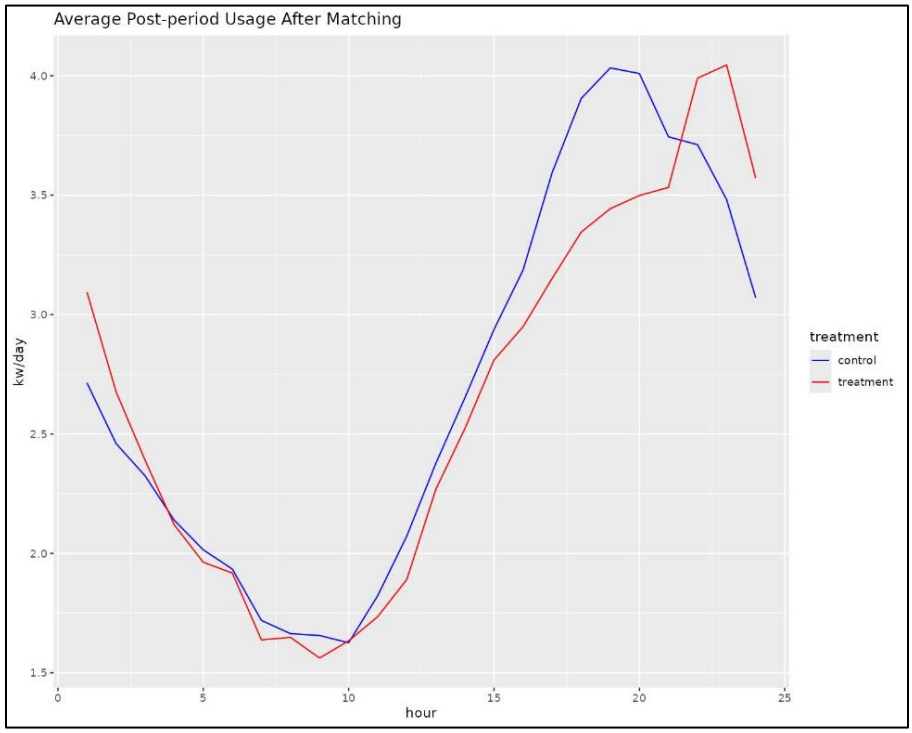


FIGURE 15-4 DISPLAYS AVERAGE POST-PERIOD USAGE FOR THE TREATMENT AND CONTROL GROUPS AFTER MATCHING. THE EV PILOT REQUIRED PARTICIPANTS TO CHARGE THEIR EV'S DURING THE OFF-PEAK HOURS FROM 9 PM TO 6 AM ON WEEKDAYS, AND ANY TIME ON WEEKENDS AND HOLIDAYS. THE LOAD SHIFT IS CLEARLY VISIBLE DURING THESE HOURS, WITH INCREASED USAGE BETWEEN 9 PM AND 6 AM, AND DECREASED USAGE BETWEEN 6 AM AND 9 PM.

As expected, the Evaluators found no statistically significant kWh savings and peak kW reductions were not a function of temperature (F) in the study post-period.

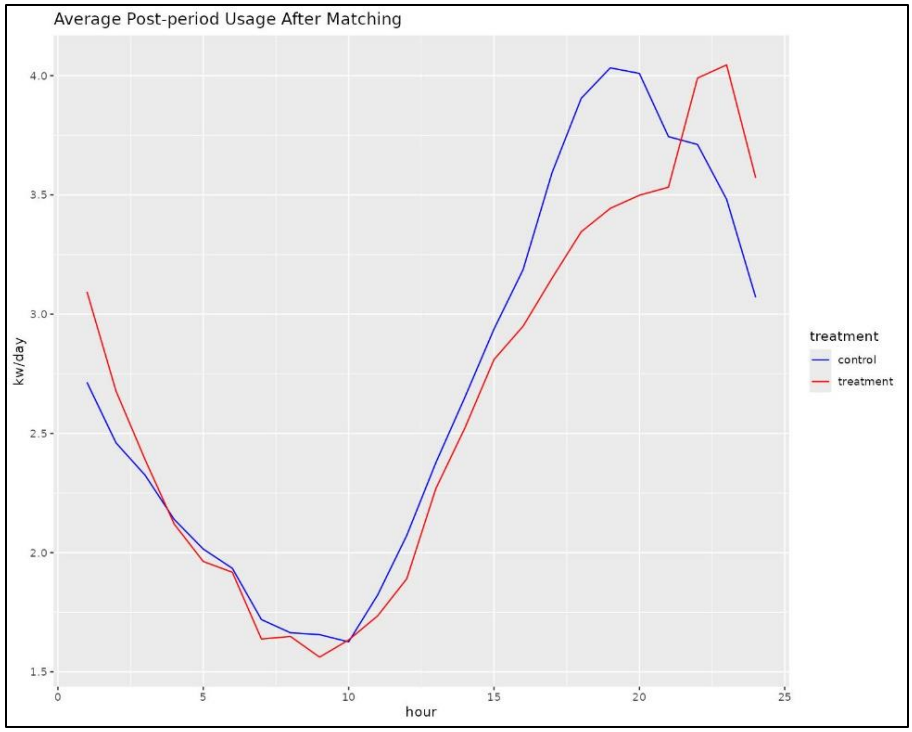


FIGURE 15-4 AVERAGE POST-PERIOD USAGE AFTER MATCHING

Table 15-9 provides average hourly kW reductions on weekdays in the post-period using the matched cohort. The largest kW reductions occur between 3 PM and 9 PM CDT and overlap with the peak period.

TABLE 15-9 PEAK KW REDUCTIONS BY HOUR, WEEKDAYS

Hour Ending (CDT)	Average Treatment Post-Period Usage (kW), After Matching	Average Control Post-Period Usage (kW), After Matching	% Change kW Usage	Absolute Change kW Usage
1	2.95	2.80	5.37%	0.15
2	2.56	2.48	3.47%	0.09
3	2.31	2.31	0.02%	0.00
4	2.08	2.12	-1.87%	-0.04
5	1.96	1.99	-1.31%	-0.03
6	1.91	1.89	1.22%	0.02
7	1.66	1.72	-3.57%	-0.06
8	1.71	1.66	3.20%	0.05
9	1.55	1.58	-2.12%	-0.03
10	1.57	1.52	3.20%	0.05
11	1.62	1.69	-4.27%	-0.07
12	1.80	1.96	-8.35%	-0.16
13	2.17	2.28	-5.16%	-0.12
14	2.44	2.56	-4.58%	-0.12
15	2.71	2.84	-4.61%	-0.13
16	2.77	3.09	-10.46%	-0.32
17	3.03	3.56	-14.73%	-0.52
18	3.26	3.89	-16.38%	-0.64
19	3.40	4.02	-15.35%	-0.62
20	3.42	4.05	-15.50%	-0.63
21	3.48	3.86	-9.90%	-0.38
22	4.04	3.87	4.39%	0.17
23	4.17	3.64	14.63%	0.53
24	3.67	3.18	15.65%	0.50

Using results from the matched control group, the Evaluators calculated the PY13 kW reduction. Results are shown below in the table below. The Evaluators utilized the same peak period hours used for demand response program DR events when calculating the peak kW reduction, namely, 3 PM to 7 PM CDT. The peak kW reductions are statistically significant at the 99.99% level.

TABLE 15-10 TOTAL GROSS EV PILOT DEMAND REDUCTIONS

Measure	Average kW Reduction per Participant per Unit	Average kW Reduction per Participant	Number of Electric Vehicles	Number of Participants	Total Program kW Reduction
EV Charging	0.484501	0.525735	102	94	49.42
Total	**0.484501**	**0.525735**	**102**	**94**	**49.42**

The overall verified kW reduction is 49.42 kW.

The Evaluators estimated an average reduction per participant of 0.5257 kW.

15.4.3 NET IMPACT FINDINGS

For demand response programs, net savings equals gross savings.

TABLE 15-11 TOTAL EV PILOT NET DEMAND REDUCTION RESULTS

Gross kW Reduction	Net-to-Gross Ratio	Net Demand Reduction
49.42	100%	49.42

15.4.4 NON ENERGY BENEFITS FINDINGS

There were no NEBs identified in this program.

15.4.5 PROCESS EVALUATION

15.4.5.1 Staff and Implementer Interviews

The following section summarizes the key findings from in-depth interviews with two ENO program staff, and one Sagewell staff; ENO staff participated in one interview and Sagewell staff participated in a second interview. These in-depth interviews aimed to learn more about the EV Charing Pilot program design and operations, and the successes and challenges experienced during PY13. Interviews lasted approximately 60 minutes and were conducted using the Microsoft Teams platform. The evaluators recorded all interviews with participant permission. The following narrative summarizes these interviews.

15.4.5.1.1 *Program Description and Implementation*

PY13 marked the first year of the "Bring Your Own Charger" (BYOC) program. This demand response pilot seeks to shift EV charging load to off-peak hours using a predetermined charging schedule. Sagewell uses software to identify potential EV chargers and invites them to participate in the program. Customers receive a monthly incentive for participating in the program. To qualify, customers must charge their car during off-peak hours at least three times a month and cannot override the charging schedule more than three times a month.

The program seeks to enroll 350 cars over the three-year pilot. Target audience is single-family home residents with level-2 chargers.

15.4.5.1.2 *Marketing*

Staff recruit participants through emails and direct mailers; they also leverage existing Energy Smart programs to promote the new pilot. Because the program is new, staff are still learning what strategies work best for this program.

15.5 Data Tracking Review

The Evaluators reviewed the tracking data and found no issues. AMI data was provided which allowed the Evaluators to estimate program impacts.

15.6 Key Findings and Recommendations

The following summarizes the key findings from the PY13 evaluation.

- Performance of EV Pilot: The EV Pilot attained 9% of its ex-post demand reduction (kW) target.
- Creation of Matched Control Group: The Evaluators successfully established a matched control group for the baseline counterfactual, enhancing the accuracy of the evaluation.
- Statistically Significant Peak kW Reductions: The EV Pilot demonstrated statistically significant peak kW reductions, achieving an average reduction of 0.53 kW per participant.
- Target Achievement Projection: To meet the demand reduction target of 530 kW, the program aims to enroll nearly 1,000 customers by the third year of the pilot. This projection underscores the necessity of scaling up customer enrollment to achieve program objectives.

The Evaluators have the following recommendations after completing the PY13 evaluation.

- Hourly Aggregation of Interval AMI Data: Interval AMI data should undergo aggregation to hourly intervals based on the hour ending datetime. It is imperative that usage is not aggregated across more than one hour. For instance, data ending at 4 PM should exclusively represent usage from 3 PM to 4 PM, ensuring accurate measurement and analysis.
- Procurement of Potential Control Customers: For future program years, the procurement of potential control customers should follow the same methodology utilized in 2023. This includes sourcing control customers from various channels such as Sagewell's EV Finder algorithm, individuals who enrolled after the program year commenced, and participants who initiated but did not complete the enrollment process. This approach ensures consistency and reliability in selecting control groups for evaluation purposes.

16 LARGE C&I DEMAND RESPONSE

16.1 Summary

The tables below report *ex ante* gross, *ex post* gross, *ex post* net energy savings (kWh) (both annual and lifetime), demand reductions (kW), participation, and incentive spend.

TABLE 16-1 PY13 LARGE C&I DR ENERGY SAVINGS (KWH)

Measure	*Ex Ante* Gross Savings (kWh)	Realization Rate (kWh)	*Ex Post* Gross Savings (kWh)	NTG	*Ex Post* Net Savings (kWh)
DR Participation	69,834	104%	72,445	100%	72,445
Total	**69,834**	**104%**	**72,445**	**100%**	**72,445**

Sums may differ due to rounding.

TABLE 16-2 PY13 LARGE C&I DR DEMAND REDUCTIONS (KW)

Measure	*Ex Ante* Gross Demand (kW)	Realization Rate (kW)	*Ex Post* Gross Demand (kW)	NTG	*Ex Post* Net Demand (kW)
DR Participation	3,720.21	81%	3,019.95	100%	3,019.95
Total	**3,720.21**	**81%**	**3,019.95**	**100%**	**3,019.95**

Sums may differ due to rounding.

TABLE 16-3 PY13 LARGE C&I DR LIFETIME SAVINGS SUMMARY

Measure	EUL	*Ex Post* Gross Lifetime Energy Savings (kWh)	*Ex Post* Net Lifetime Energy Savings (kWh)
DR Participation	1	72,445	72,445
Total	**1**	**72,445**	**72,445**

Sums may differ due to rounding.

TABLE 16-4 PY13 LARGE C&I DR PARTICIPATION AND INCENTIVE SUMMARY

Measure	Participation	Incentive Spend ($)
DR Participation	18	$186,011
Total	**18**	**$186,011**

Sums may differ due to rounding.

16.2 Program Description

The Large C&I Demand Response (Large C&I DR) program is designed to help reduce the strain on the electric grid during periods of peak demand. The automated program is free, flexible, and easy to use. The program provides scaled incentives based on the load provided (with seasonal payments in summer and winter). Customers nominate the load they will provide in collaboration with Honeywell (the program implementer) and

may provide the curtailment with automated controls or via manual curtailment of the proposed systems. Curtailed systems may include HVAC, lighting, industrial processes, or any other applicable end-use.

16.2.1 PROGRAM DELIVERY CHANNELS AND EXPECTED SAVINGS

Incentives are based on twice-yearly payments based on average demand reduction across all events during a performance period ($50/kW for summer, $10/kW for non-summer).

Motivation to participate varies from customer-to-customer, and program staff noted that they will tailor their sales pitch to meet this variety. Some customers are driven by the financial incentive, while others look at participation purely from a sustainability standpoint. However, program staff emphasized that lowering energy costs are not a main selling point, as it could just be one outcome of the program, not a main driver. Being able to return to in-person engagement has really helped the program this year and seen as an overall success. Additionally, being able to present to larger hospitals in the area, paving the way for enrollment for new program year, has also been a huge success.

The program did not hit the demand reduction target of 6,970.00 in PY13.

16.2.2 TIMING OF PROJECTS

All projects occurred from May to September.

16.2.3 TRADE ALLIES

There were no reported trade allies in this program.

16.2.4 GOAL ACHIEVEMENT

The table below summarizes the programs' performance against goal.

TABLE 16-5 LARGE C&I DR PERFORMANCE TOWARDS GOAL

Ex Post Gross Energy Savings (kWh) Goal	% to kWh Goal	*Ex Post* Gross Energy Savings (kWh)	*Ex Post* Gross Savings (kW) Target	% to kW Target	*Ex Post* Gross Savings (kW)
0	NA	72,445	6,970.00	43.33%	3,019.95

16.3 EM&V Methodology

The Evaluators employed the following approach to complete impact evaluation activities for the program. The Evaluator followed the Calculated Baseline approach outlined in the Midcontinent Independent System Operator, Inc. (MISO) Business Practices Manual (BPM)[20]. The following impact evaluation steps were taken to determine the suitability of the MISO Calculated Baseline approach:

[20] *Ibid.*

- Developed an Unadjusted Consumption (UC) Baseline, a Symmetric Multiplicative Adjustment (SMA) Baseline, and a Weather Sensitive Adjustment (WSA) Baseline for each program participant. Loads were calculated utilizing 15-minute AMI data.
- Determined days that will serve as proxy days for testing the suitability of the baseline approach. Proxy days represent days like demand response event days in terms of load shape and temperature profiles.
- Estimated bias (uncertainty) and error on proxy days for each model to assess baseline performance. Bias is assessed by examining the average percent error of the baseline predictions relative to the actual usage on proxy days. In a similar manner, error is assessed through various metrics such as Root Mean Squared Error (RRMSE) using baseline predictions and actual usage on proxy days.
- Assigned the model/baseline with the lowest bias to each customer.
- Assessed bias and error for the entire program population and customers with the largest nominated loads, with the goal of minimizing bias and error for the program overall.

16.3.1GROSS IMPACT

In the evaluation of demand response programs, energy savings are estimated by comparing a participant's load shape during a demand response event with a baseline load shape. This baseline load is assumed to be a good estimate of the counterfactual load—that is, the load that would have manifested had there not been an event called that day.

16.3.1.1 Data Sources

Data used for this evaluation include program tracking data that identifies which customers participated in the program and contains data fields such as contract curtailment amount, hourly usage, hourly baseline estimates, 15-minute interval meter data (AMI) for each customer participating in the program, and a full schedule of DR program events, including the time of the event.

16.3.1.2 MISO Calculated Baseline Approach (Customer Baselines)

The following details the general requirements for the MISO Calculated Baseline Approach. The Evaluators developed Customer Baselines (CBLs) in accordance with this approach. For a demand resource, the Consumption Baseline is a profile of hourly demand based on an averaged sample of historical data which may be adjusted for factors that reflect specific, on-the-day conditions, such as temperature.

The default consumption baseline is designed as follows:

- Separate hourly demand profiles for non-holiday weekdays and for weekends/holidays
- The "weekday" hourly profile is based on the average of the ten (10), but not less than five (5), most recent weekdays that are not holidays or other non-standard "event" days
- The "weekend/holiday" hourly profile is based on the average of the four (4), but not less than two (2), most recent weekend days or holidays that are not "event" days
- An "event" day is one during which there was, for the resource in question, a real- time energy or ancillary services dispatch, or a scheduled outage
- The maximum look-back window is limited to 45 days
- If the 45-day window contains insufficient days to meet the minimum number of days described above, the profiles are constructed based on the available days within the 45-day window that qualify,

supplemented by the largest (MW) matching "event" day(s) values for that resource within that same window as necessary to obtain the minimum number of values.

Adjustment mechanisms to the default Consumption Baseline include:

- Symmetric Multiplicative Adjustment (SMA)
  - Adjusts each baseline hourly value (MW) during the event up or down by the ratio of
  - (a) the sum of hourly demands for the three hours beginning four hours prior to the event and (b) the sum of those same three hourly baseline demands
  - The adjustment is limited to a change in any individual baseline hour of plus or minus 20 percent.
  - If multiple events occur during the same day, the SMA is calculated only for the first event, but applied to all events that day.
- Weather Sensitive Adjustment (WSA)
  - Adjusts each baseline hourly value (MW) up or down by a Weather Adjustment Factor
  - The Weather Adjustment Factor is determined by a mathematical relationship derived through a regression analysis that considers the DRR load and historical hourly temperature data.

16.3.1.3 Evaluators MISO Models

The following CBL models were developed for each customer in accordance with MISO protocols.

For a 10-of-10 (or 5-of-5) unadjusted baseline, the Evaluators examine the load data from the most recent ten (or five) non-event, non-holiday weekdays relative to the event day and calculate the mean demand usage values of the ten (or five) highest load days. This baseline is then adjusted for the SMA and WSA models utilizing the method described in Section 16.3.1.2.

TABLE 16-6 EVALUATORS' MISO CBL MODELS

Model Type	Baseline Days	SMA	WSA
Unadjusted	10-of-10	No	No
SMA-Adjusted	10-of-10	Yes	No
WSA-Adjusted	10-of-10	No	Yes
Unadjusted	5-of-5	No	No
SMA-Adjusted	5-of-5	Yes	No
WSA-Adjusted	5-of-5	No	Yes

16.3.1.4 Baseline and Proxy Day Development

The Evaluators defined proxy days as the top four non-event, non-holiday, non-weekend days with the highest loads across all summer months. In addition, proxy days must display a maximum temperature of greater than or equal to the minimum temperature observed during normal curtailment hours during the events. The Evaluators used these defined proxy days to determine the ability of CBL models to predict actual usage for each customer.

16.3.2 NET IMPACT

In demand response programs, it is typically assumed that there are neither spillover nor free-ridership effects (customers are not expected to curtail without participating). Although customers can find workarounds to make up for lost productivity due to demand response events, they are compensated only if they reduce their load during the peak demand window, the primary program goal. As such, the net-to-gross ratio for this program is assumed to be 100%.

16.4 Evaluation Findings

16.4.1 GROSS IMPACT

Twelve events were called during the summer of 2023 between the hours of 1500 and 1800 CDT, as shown in the table below.

TABLE 16-7 EVENT DATES AND TIMES

Event Dates	Event Times (CDT)
6/13/2023	16:00-18:00
6/15/2023	16:00-18:00
6/29/2023	16:00-18:00
7/18/2023	16:00-18:00
7/21/2023	16:00-18:00
8/1/2023	16:00-18:00
8/4/2023	15:00-17:00
8/8/2023	15:00-17:00
8/10/2023	15:00-17:00
8/11/2023	15:00-17:00
8/15/2023	15:00-17:00
8/23/2023	15:00-17:00

16.4.1.1 Performance Versus Nomination Comparison

The Evaluator compared realized kW for each site with their nominated kW to summarize the extent to which participants have met their nominated load curtailments. The names of sites have been anonymized to protect customer confidentiality.

The ex post gross demand (kW) curtailment as a percentage of nominated load is 54%. Load nominations have consistently been higher than ex post gross demand (kW) on average each program year.

TABLE 16-8 SITE LEVEL RESULTS

Site	Nominated kW	Ex Post Gross Demand (kW)	% of Nominated Load
Site 1	96	87.36	91%
Site 2	80	5.06	6%
Site 3	74	3.52	5%
Site 4	88	54.32	62%
Site 5	700	2,002.48	286%
Site 6	73	12.04	16%
Site 7	339	74.49	22%
Site 8	137	5.62	4%
Site 9	1,500	303.77	20%
Site 10	1,500	179.08	12%
Site 11	56	18.26	33%
Site 12	260	118.33	46%
Site 13	181	86.77	48%
Site 14	87	7.84	9%
Site 15	89	12.22	14%
Site 16	248	32.53	13%
Site 17	74	10.04	14%
Site 18	10	6.20	62%
Total	**5,592.00**	**3,019.95**	**54%**

16.4.1.2 Load Shapes and Model Performance

The figures below are average load shapes for all sites on proxy and event days and depict actual kW and baseline kW. While the figures show that baseline kW is not an exact match for actual kW during the hours of curtailment, the differences are expected to average out, with some days over-estimating the baseline and other days under-estimating the baseline. In addition, the Evaluators determined that the site with the largest usage has erratic loads that are not easily predicted using the agreed-upon MISO models, which depend on either weather or prior usage patterns.

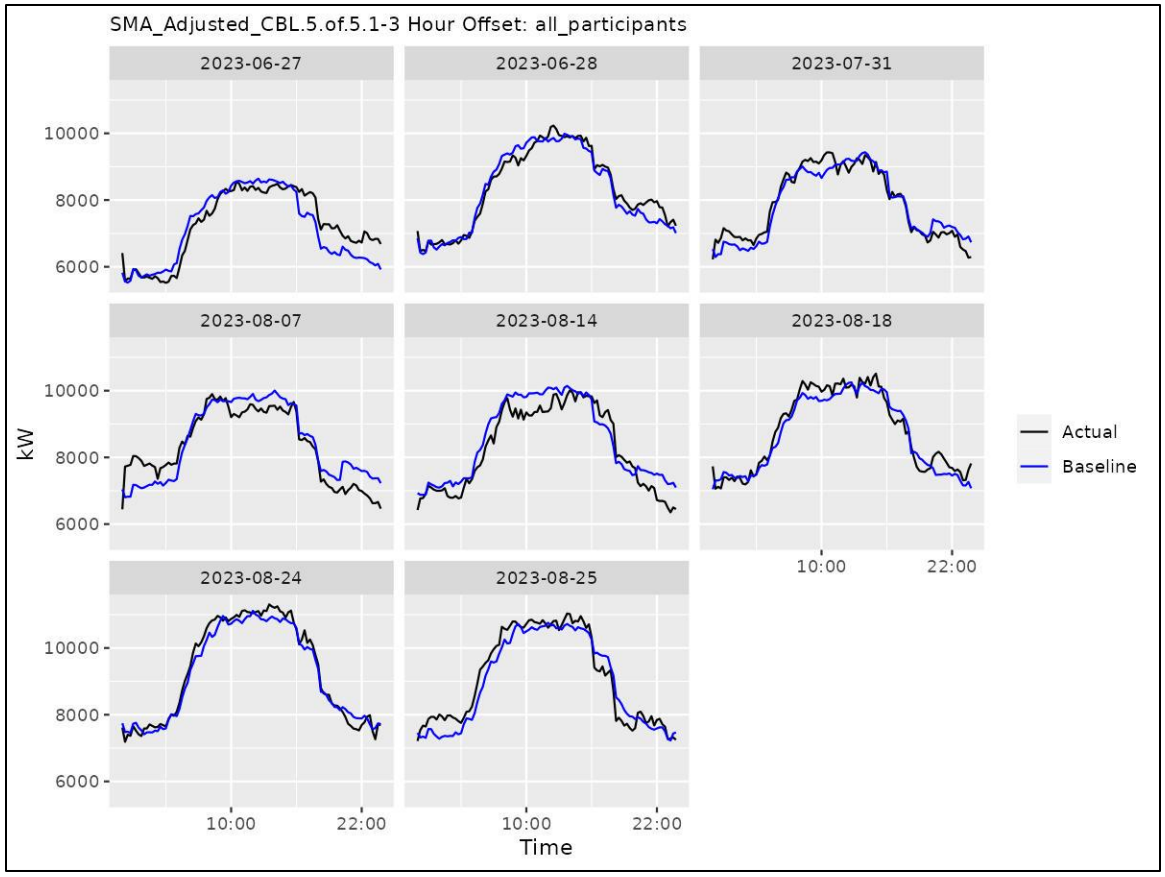


FIGURE 16-1 PROXY DAY LOAD SHAPES

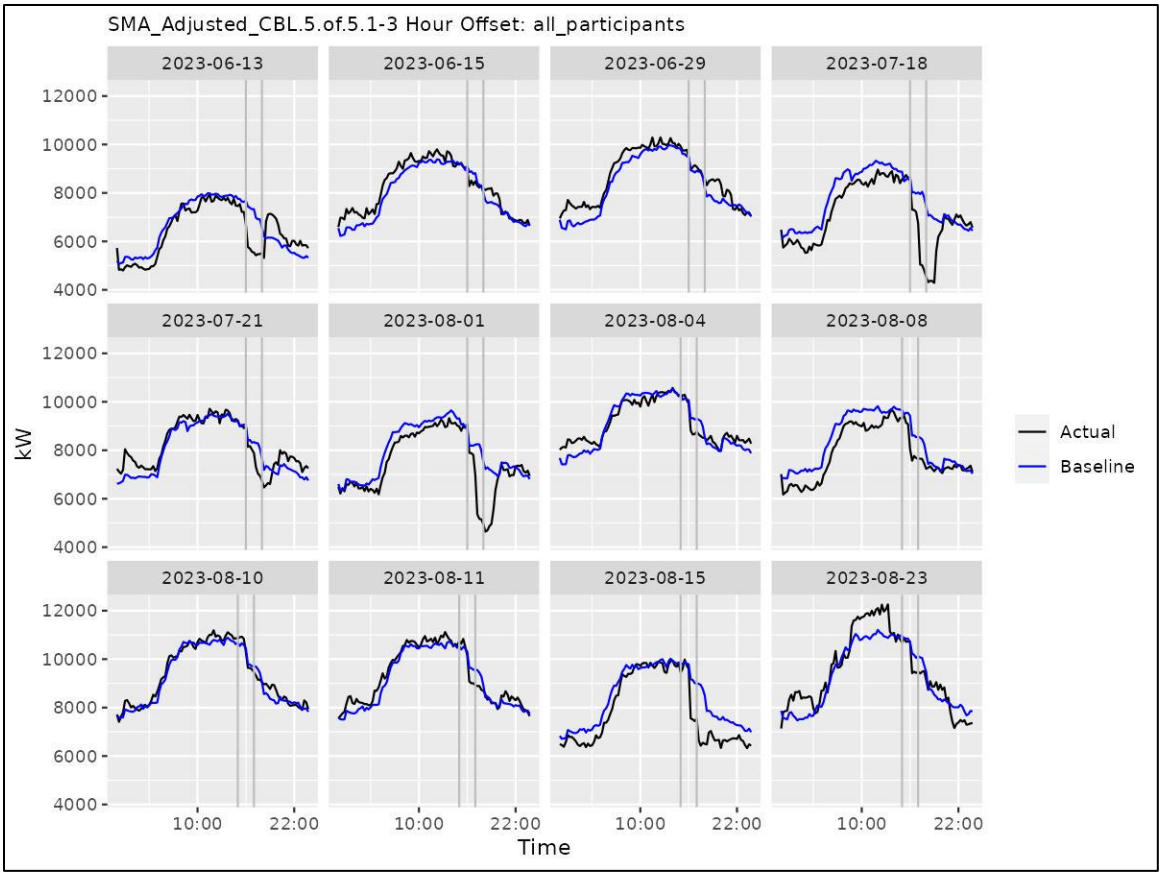


FIGURE 16-2 EVENT DAY LOAD SHAPES

The Evaluators estimated bias and error for the Evaluators' MISO models across all sites and when applied on a site-specific basis and selecting for the model with the lowest bias (shown as the "SMA Adjusted CBL 5-of-5"). In addition, the Evaluator estimated and verified Honeywell's *Ex Ante* model for all sites. As shown in the table below, the Evaluator's baseline model performed the best by having the lowest absolute bias. The Evaluator determined that the method of additive adjustment for Honeywell's CBL model does not match the approved adjustment factors in the MISO protocols which only allow for multiplicative or weather-sensitive adjustments[21].

[21] Per MISO, the offset factor must also begin three hours prior to the event start time, whereas Honeywell's utilizes a one hour offset factor beginning two hours prior to the event start time.

TABLE 16-9 MODEL FIT

Model	Follows MISO Protocols	RRMSE	RMSE	Bias	Best Fit Model (Lowest Absolute Bias)
SMA Adjusted CBL 5-of-5	X	0.033	15.698	-0.68%	X
WSA Adjusted CBL 10-of-10	X	0.050	23.296	1.01%	
SMA Adjusted CBL 10-of-10	X	0.036	17.082	-1.19%	
Mixed Model CBL (site-specific)	X	0.046	21.422	-1.88%	
WSA Adjusted CBL 5-of-5	X	0.052	24.645	2.19%	
Unadjusted CBL 5-of-5	X	0.060	28.190	-3.21%	
Honeywell CBL 10-of-10 Additive Adjustment (2-Hour Offset)		0.053	24.831	3.91%	
Unadjusted CBL 10-of-10	X	0.064	30.274	-4.26%	

The table below shows the expected savings, verified savings and realization rate for the program. The realization rate of kWh is 81% because the *ex ante* Honeywell baselines had large positive bias on proxy days and the Honeywell baselines were higher than any of the *ex post* MISO models.

TABLE 16-10 VERIFIED GROSS IMPACTS

Measure	Expected kWh	Expected kW	Verified Gross kWh	Verified Gross kW	Realization Rate kWh	kW Realization Rate
DR Participation	69,834	3,720.21	72,445	3,019.95	104%	81%

16.4.2 NET IMPACT

The NTG is assumed to be 100% for demand response programs.

Program results can be found in tables in Section 16.1.

16.4.3 PROCESS FINDINGS

16.4.3.1 Staff and Implementer Interviews

The following section summarizes the key findings from in-depth interviews with two ENO program staff, and one two Honeywell staff; ENO staff participated in one interview and Honeywell staff participated in a second interview. These in-depth interviews aimed to learn more about the Large C&I Demand Response program design and operations, and the successes and challenges experienced during PY13. Interviews lasted approximately 60 minutes and were conducted using the Microsoft Teams platform. The evaluators recorded all interviews with participant permission. The following narrative summarizes these interviews.

16.4.3.1.1 *Program Description and Implementation*

The Large C&I Demand Response (Large C&I DR) program is designed to help reduce the strain on the electric grid during periods of peak demand. The automated program is free, flexible, and easy to use. The program provides scaled incentives based on the load provided (with seasonal payments in summer and winter). Customers nominate the load they will provide in collaboration with Honeywell (the program implementer) and

may provide the curtailment with automated controls or via manual curtailment of the proposed systems. Curtailed systems may include HVAC, lighting, industrial processes, or any other applicable end-use.

PY13 witnessed minimal changes to the large C&I demand response program. Program staff continue to recruit, market to, and enroll program participants. When beginning a new project, program staff conduct a demand response survey to understand their clients' operational restrictions and typical utility usage. From there, they can make calculations that predict how much energy the customers can reduce during peak events. Customers then sign up for specific kilowatt reduction goals that they can meet over the course of the peak demand events. The program is completely voluntary; customers can opt out of events at any time.

Typically, customers are warned of an upcoming event about 24 hours in advance via a notification. The program is automated, so unless the customer opts out of the event their usage will automatically be reduced once the event begins. Typically, events last about 2-3 hours and occur in the middle of heat waves or other predictable events. Customers are told to expect anywhere from 4-8 events when they enroll. When enrolling in the program customers often express concern regarding comfort during events, however staff note that the set points are so low that comfort is rarely impacted, and customers often do not even realize the event is happening.

Program staff encourage customers to plan for events and practice pre-cooling prior to an event. Staff underscored that this program is not an energy saving savings program but rather a load shifting, demand reduction program.

16.4.3.1.2 *Marketing*

Program marketing consists of handouts, information on the website, lunch-n-learns, and industry presentations. Staff note that word of mouth accounts for most of their recruitment. Honeywell manages all program marketing, communicating for account managers to help with scheduling and logistics.

16.5 Data Tracking Review

The Evaluators reviewed the tracking data and found no issues. AMI data was provided and was complete for all sites which allowed the Evaluators to estimate program impacts.

16.6 Findings and Recommendations

The following summarizes the key findings and conclusions from the PY13 evaluation.

- Utilization of Hourly Interval AMI Data: Throughout PY13, the evaluation capitalized on hourly interval AMI data across all sites, ensuring comprehensive data coverage for robust analysis and evaluation.
- Enrollment Goals and Performance: Despite Honeywell's failure to meet enrollment targets for the program in PY13, there has been a consistent increase in the achieved percentage of targets over the years. Notably, the program attained 32% of its kW target in PY13, a substantial improvement from previous years, with a notable increase to 43% in PY13. This upturn in kW savings can be attributed to the incorporation of seven new sites during the evaluation period.
- Recruitment Strategies: Program recruitment primarily relies on word-of-mouth referrals, underscoring the significance of personal recommendations and positive experiences in driving participation. Additionally, program marketing initiatives encompass a range of strategies, including the distribution of

informative handouts, dissemination of program details through the official website, hosting of educational sessions such as lunch-n-learns, and active participation in industry presentations. Staff members acknowledge the paramount role played by word of mouth in recruitment efforts, highlighting its effectiveness in fostering program engagement and participation within the target audience.

The following summarizes key recommendations after completing the PY13 evaluation.

- Strengthen Collaborative Partnerships: It is recommended that the program continues to foster relationships with other C&I programs. Leveraging partnerships with other C&I initiatives can serve as an effective strategy for identifying and recruiting potential customers interested in participating in the demand response program. Collaborative efforts can enhance outreach and engagement efforts, ultimately expanding the program's reach and impact within the C&I sector.
- Conduct Educational Workshops: Consider organizing educational workshops focused on demand response for both prospective and current customers. Many customers face challenges in comprehending incentive structures and program mechanics related to demand response initiatives. Therefore, conducting educational workshops can address these knowledge gaps and provide customers with valuable insights into baseline measurement methodologies, the overall EM&V process, and the estimation of potential benefits. By enhancing customer understanding, these workshops can contribute to improved retention rates, particularly for key accounts that contribute significantly to kW reductions.
- Implement Cross-Promotion Strategies: Explore opportunities to cross-promote the Large C&I Demand Response program with relevant projects under the Large C&I Solutions umbrella. Large C&I Solutions initiatives often involve customer engagements centered on building commissioning or the deployment of building automation systems (BAS). Capitalizing on these engagements presents an ideal scenario to advocate for the registration of BAS-covered systems for demand response load shedding rebates. By aligning incentives and highlighting the synergies between demand response and BAS implementation, businesses can be incentivized to actively participate in demand response activities, thus furthering energy efficiency objectives and maximizing program impact.

17 SMALL C&I SOLUTIONS

17.1 Summary

The tables below report *ex ante* gross, *ex post* gross, *ex post* net energy savings (kWh) (both annual and lifetime), demand reductions (kW), participation, and incentive spend, by measure, where applicable. Additionally, the tables above represent evaluation findings for each measure, whereas the analysis described in this chapter summarize the findings of the evaluation by type (e.g., OLM, kit, etc.) and by stratum.

TABLE 17-1 PY13 SMALL C&I SOLUTIONS ENERGY SAVINGS (KWH)

Measure	*Ex Ante* Gross Savings (kWh)	Realization Rate (kWh)	*Ex Post* Gross Savings (kWh)	NTG	*Ex Post* Net Savings (kWh)
HVAC	30,127	107%	32,286	100%	32,286
Linear LED	541,419	93%	500,965	100%	500,965
Screw Based LED	238,788	92%	219,637	100%	219,637
LED Exit Sign	10,553	82%	8,625	100%	8,625
Lighting Controls	2,118	90%	1,906	100%	1,906
Incentive Bonus	0	100%	0	100%	0
LED Fixtures	517,425	98%	509,373	100%	509,373
Door Gaskets	10,116	100%	10,120	100%	10,120
Incentive Bonus	0	100%	0	100%	0
BMS	713,577	98%	699,885	100%	699,885
AC Tune Up	41,608	126%	52,503	100%	52,503
OLM Smart Thermostats	42,489	73%	31,017	100%	31,017
Faucet Aerator	5,070	80%	4,056	100%	4,056
Retail Business Kit	8,101	87%	7,039	100%	7,039
Evaporator Fan Controllers	1,507	33%	501	100%	501
Advanced Power Strips	2,509	65%	1,631	100%	1,631
Office Business Kit	22,786	87%	19,801	100%	19,801
OLM LED Exit Sign	984	100%	984	100%	984
OLM Screw Based LED	1,624	100%	1,624	100%	1,624
Restaurant Business Kit	1,514	87%	1,315	100%	1,315
Chiller	24,906	111%	27,627	100%	27,627
Smart Thermostat	44,853	104%	46,843	100%	46,843
Low-flow Showerhead	146	71%	104	100%	104
Strip Curtain	647	114%	738	100%	738
Compressed Air Optimization	189,029	99%	186,361	100%	186,361
Insulation	25,858	103%	26,742	100%	26,742
Exterior LED	8,703	97%	8,474	100%	8,474
Total	**2,486,454**	**97%**	**2,400,157**	**100%**	**2,400,157**

Sums may differ due to rounding.

TABLE 17-2 PY13 SMALL C&I SOLUTIONS DEMAND REDUCTIONS (KW)

Measure	*Ex Ante* Gross Demand (kW)	Realization Rate (kW)	*Ex Post* Gross Demand (kW)	NTG	*Ex Post* Net Demand (kW)
HVAC	9.49	115%	10.95	100%	10.95
Linear LED	96.44	109%	105.37	100%	105.37
Screw Based LED	48.69	100%	48.56	100%	48.56
LED Exit Sign	0.44	94%	0.41	100%	0.41
Lighting Controls	0.59	83%	0.49	100%	0.49
Incentive Bonus	0.00	100%	0.00	100%	0.00
LED Fixtures	46.44	109%	50.62	100%	50.62
Door Gaskets	1.15	100%	1.15	100%	1.15
Custom	0.00	100%	0.00	100%	0.00
BMS	0.00	100%	0.00	100%	0.00
AC Tune Up	15.47	134%	20.80	100%	20.80
OLM Smart Thermostats	0.00	100%	0.00	100%	0.00
Faucet Aerator	1.08	80%	0.86	100%	0.86
Retail Business Kit	2.31	87%	2.00	100%	2.00
Evaporator Fan Controllers	0.17	33%	0.06	100%	0.06
Advanced Power Strips	0.00	100%	0.00	100%	0.00
Office Business Kit	6.37	87%	5.53	100%	5.53
OLM LED Exit Sign	0.14	100%	0.14	100%	0.14
OLM Screw Based LED	0.29	100%	0.29	100%	0.29
Restaurant Business Kit	0.30	87%	0.26	100%	0.26
Chiller	12.04	123%	14.80	100%	14.80
Smart Thermostats	0.00	100%	0.00	100%	0.00
Low Flow Shower Heads	6.48	71%	4.60	100%	4.60
Strip Curtains	0.07	127%	0.08	100%	0.08
Compressed Air Optimization	22.72	99%	22.40	100%	22.40
Insulation	6.56	104%	6.81	100%	6.81
Exterior LED	0.00	100%	0.00	100%	0.00
Total	**277.21**	**109%**	**296.19**	**100%**	**296.19**

Sums may differ due to rounding.

TABLE 17-3 PY13 SMALL C&I SOLUTIONS LIFETIME SAVINGS SUMMARY

Measure	EUL	*Ex Post* Gross Lifetime Energy Savings (kWh)	*Ex Post* Net Lifetime Energy Savings (kWh)
HVAC	15	484,296	484,296
Linear LED	15	7,514,474	7,514,474
Screw Based LED	1	219,637	219,637
LED Exit Sign	15	129,374	129,374
Lighting Controls	8	15,245	15,245
Incentive Bonus	1	0	0
LED Fixtures	15	7,640,595	7,640,595
Door Gaskets	4	40,480	40,480
Custom	20	0	0
BMS	15	10,498,277	10,498,277
AC Tune Up	10	525,029	525,029
OLM Smart Thermostats	11	341,187	341,187
Faucet Aerator	10	40,558	40,558
Retail Business Kit	13	94,106	94,106
Evaporator Fan Controllers	16	8,016	8,016
Advanced Power Strips	10	16,310	16,310
Office Business Kit	10	206,159	206,159
OLM LED Exit Sign	15	14,760	14,760
OLM Screw Based LED	1	1,624	1,624
Restaurant Business Kit	10	13,802	13,802
Chiller	20	552,534	552,534
Smart Thermostats	11	515,276	515,276
Low Flow Shower Heads	10	1,037	1,037
Strip Curtains	5	3,688	3,688
Compressed Air Optimization	3	559,083	559,083
Insulation	20	534,843	534,843
Exterior LED	15	127,107	127,107
Total	**11**	**30,314,677**	**30,314,677**

Sums may differ due to rounding.

TABLE 17-4 PY13 SMALL C&I SOLUTIONS COUNT OF MEASURES AND INCENTIVE SPEND

Measure	Participation (Count of Measures)	Incentive Spend ($)
HVAC	5	$2,790
Linear LED	96	$50,979
Screw Based LED	93	$6,190
LED Exit Sign	9	$948
Lighting Controls	4	$240
Incentive Bonus	38	$45,953
LED Fixtures	46	$52,443
Door Gaskets	4	$1,408
Custom	10	$1,693
BMS	14	$85,629
AC Tune Up	7	$3,538
OLM Smart Thermostats	72	$15,968
Faucet Aerator	8	$495
Retail Business Kit	5	$214
Evaporator Fan Controllers	1	$210
Advanced Power Strips	7	$1,123
Office Business Kit	12	$714
OLM LED Exit Sign	2	$72
OLM Screw Based LED	5	$94
Restaurant Business Kit	1	$44
Chiller	1	$3,500
Smart Thermostats	43	$13,165
Low Flow Shower Heads	3	$21
Strip Curtains	1	$86
Compressed Air Optimization	1	$1,620
Insulation	2	$3,103
Exterior LED	1	$155
Total	**491**	**$292,395**

Sums may differ due to rounding.

17.2 Program Description

The Small C&I Solutions program provides higher incentives to small business owners to help overcome the first-cost barrier that small businesses face in adopting energy efficiency improvements. By offering enhanced financial incentives, the program generates significant cost-effective energy savings for small businesses using added market-segmented strategies that encourage the adoption of diverse efficiency measures in target sub-sectors.

The incentives provided are summarized below in the table below.

TABLE 17-5 SUMMARY OF OFFERING INCENTIVES

Measure	Incentive
Prescriptive	$ per unit
Custom Lighting	$0.12 per kWh Saved
Custom Non-Lighting	$0.12 per kWh Saved

The offering is designed to provide small business owners with energy efficiency information and develop awareness of energy and non-energy benefits of energy efficiency. The information helps small business customers invest in energy efficient technologies and help overcome high “first costs.” It is intended to increase awareness of the latest energy efficient technologies available to small business customers. Through the offering, a network of trade allies was developed that work specifically with small business customers. The offerings provide the tools and training for trade allies to quantify the energy savings and incentives for small business customers.

This year, staff are very pleased with their more streamlined application process and having more outreach staff on-hand to help walk participants through the application process. Additionally, staff noted that ENO is forwarding project leads or requests for program information, which has been helpful in increasing program participation and program awareness. Also, being able to return to in-person engagement this year has also attributed to the program successes.

17.2.1 PROGRAM DELIVERY CHANNELS AND EXPECTED SAVINGS

The evaluation approach for PY13 included the following activities: database review, desk review, site visits, participant surveys and staff interviews.

A total of 214 projects were completed across are measure offerings in PY13. The figure below shows the contribution to savings by offering as part of the overall expected savings.

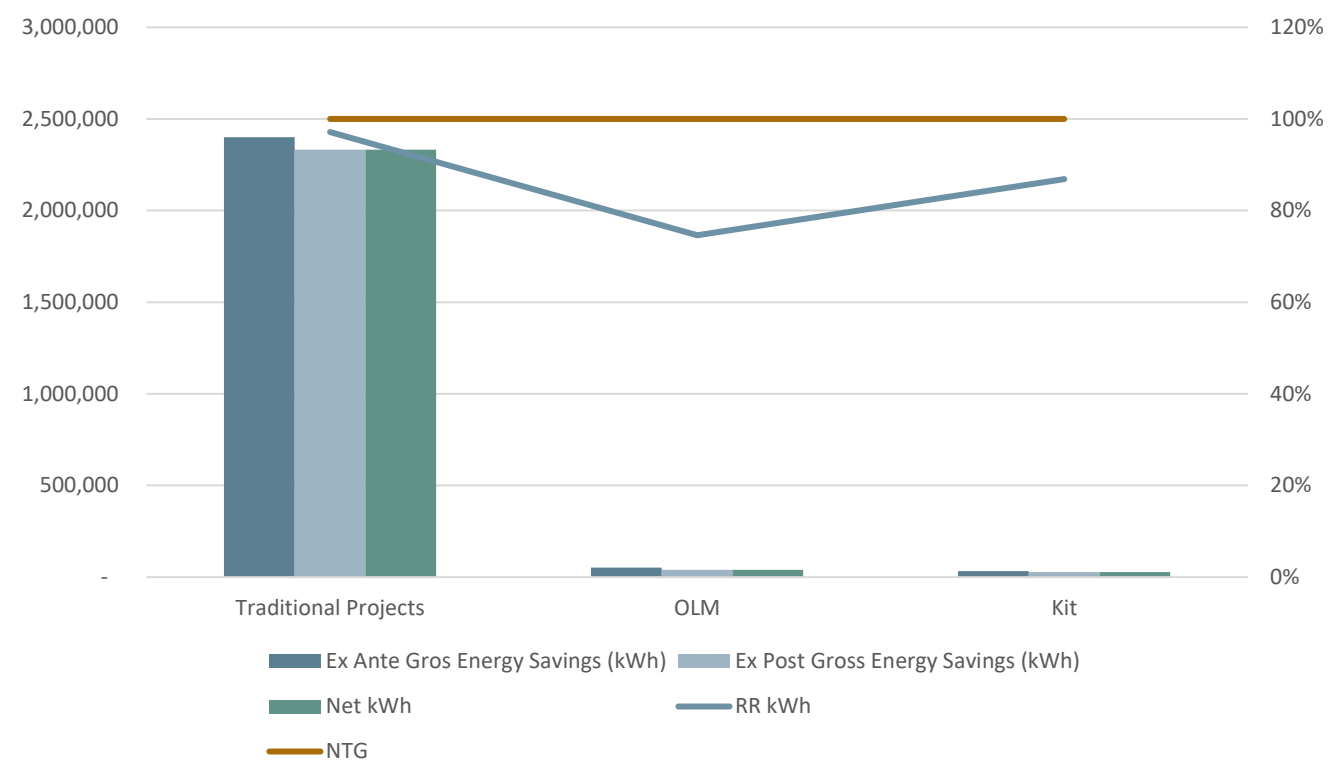


FIGURE 17-1 SAVINGS BY PROJECT TYPE

17.2.2 TIMING OF PROJECTS

Expected energy savings and the month in which the project was closed out are shown in the figures below.

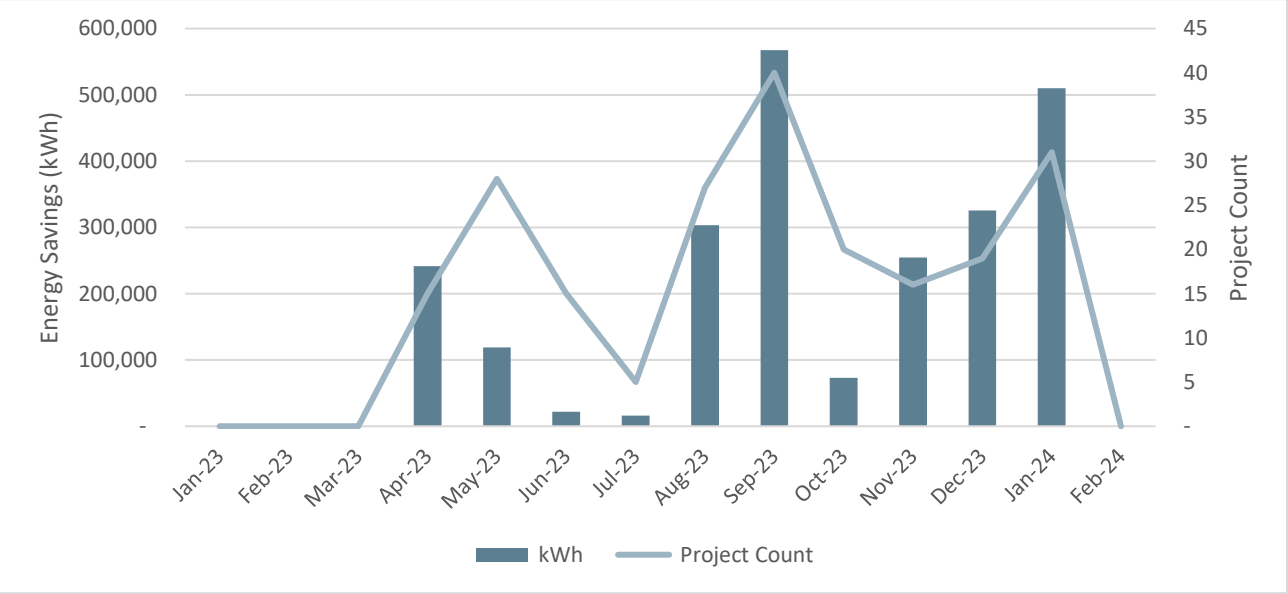


FIGURE 17-2 SMALL C&I SOLUTIONS MONTHLY PROGRAM PAYMENT

Twenty-one percent of expected savings had a completion date listed as January of 2024. Project close outs happened in 2024 (final invoices, payments, etc.) but all installation work was completed by December 31, 2023 with the exception of two projects with an installation date noted as being in July and October of 2022.

17.2.3TRADE ALLIES

In PY13, the program saw projects completed by 32 different trade allies. The below table shows trade ally activity.

TABLE 17-6 SMALL C&I SOLUTIONS TRADE ALLY ACTIVITY

Trade Ally	Ex Ante kWh	Project Count	Ex Ante kWh %
Trade Ally 1	88,139	90	3.5%
Trade Ally 2	345,067	64	13.9%
Trade Ally 3	399,477	6	16.1%
Trade Ally 4	76,149	2	3.1%
Trade Ally 5	233,787	5	9.4%
Trade Ally 6	2,795	1	0.1%
Trade Ally 7	23,742	1	1.0%
Trade Ally 8	49,247	1	2.0%
Trade Ally 9	94,105	1	3.8%
Trade Ally 10	7,346	1	0.3%
Trade Ally 11	6,894	1	0.3%
Trade Ally 12	64,826	6	2.6%
Trade Ally 13	87,149	1	3.5%
Trade Ally 14	10,020	1	0.4%
Trade Ally 15	47,441	1	1.9%
Trade Ally 16	11,258	1	0.5%
Trade Ally 17	1,507	1	0.1%
Trade Ally 18	135,504	1	5.4%
Trade Ally 19	583,914	12	23.5%
Trade Ally 20	1,002	1	0.0%
Trade Ally 21	2,828	1	0.1%
Trade Ally 22	25,858	2	1.0%
Trade Ally 23	42,514	1	1.7%
Trade Ally 24	7,669	1	0.3%
Trade Ally 25	24,906	1	1.0%
Trade Ally 26	10,068	1	0.4%
Trade Ally 27	33,919	1	1.4%
Trade Ally 28	20,132	4	0.8%
Trade Ally 29	16,032	1	0.6%
Trade Ally 30	2,770	1	0.1%

Trade Ally 31	20,146	1	0.8%
Trade Ally 32	10,248	1	0.4%

17.2.4GOAL ACHIEVEMENT

The total verified savings and percentage of goals for the program are summarized in the table below.

TABLE 17-7 SMALL C&I SOLUTIONS SUMMARY OF GOAL ACHIEVEMENT

Ex Post Gross Energy Savings (kWh) Goal	% to kWh Goal	*Ex Post* Gross Energy Savings (kWh)
4,925,994	49%	2,400,157

17.3 EM&V Methodology

Evaluation of the offering requires the following:

- Stratified Random Sampling (as detailed in section Stratified Sampling by selecting large saving sites with certainty).
- The Evaluators conducted 1 site visit for the Small C&I solutions Program.
- Where custom project hours were used, publicly-available facility hours or phone calls were made to project contacts to verify schedules.
- Gross savings were estimated using proven techniques, including engineering calculations using industry standards and verification of computer simulations developed by program trade allies to determine energy savings.
- Interviewing of program participants and trade allies.

17.3.1SITE VISITS

To approach the impact evaluation, data was collected through review of program materials and on-site inspections were performed to inform savings calculations. Based on data provided by staff, sample designs were developed for the impact evaluation.

The on-site inspection was used to help verify installations and to determine any changes to the operating parameters since the measures were first installed. The Evaluators verified that NO TRM V6.1 lighting hours of operation had been correctly assigned by space type. Projects were deemed analyzed using the methods described in the NO TRM V6.1, Section D.6.2 and 3, Lighting Efficiency and Lighting Controls. Specific algorithms for lighting savings and an explanation of deemed inputs are below.

17.3.2NON-KIT PROJECTS

17.3.2.1 Lighting Savings Calculations

$$kWh_{savings} = \sum \left(\left[N_{fixt(i)} \times \frac{W_{fixt(i)}}{1000} \right]_{pre} - \left[N_{fixt(i)} \times \frac{W_{fixt(i)}}{1000} \right]_{post} \right) \times AOH \times IEF_E$$

$$kW_{savings} = \sum \left(\left[N_{fixt(i)} \times \frac{W_{fixt(i)}}{1000} \right]_{pre} - \left[N_{fixt(i)} \times \frac{W_{fixt(i)}}{1000} \right]_{post} \right) \times CF \times IEF_D$$

Where:

Nfixt(i), pre = Pre-retrofit number of fixtures of type i

Nfixt(i), post = Post-retrofit number of fixtures of type i

Wfixt(i), pre = Rated wattage of pre-retrofit fixtures of type i (Standard Wattage Table, Appendix E pages C-323 to C-475)

Wfixt(i), post = Rated wattage of post-retrofit fixtures of type i (Appendix E)

CF = Peak demand coincidence factor (TRM Table 227, pages C-294 to C-295)

AOH = Annual operating hours for specified space type (TRM Table 227, pages C-294 to C-295)

IEFD = Interactive effects factor for demand savings (TRM Table 228, page C-296)

IEFE = Interactive effects factor for energy savings (TRM Table 228, page C-296)

17.3.2.2 Sample Design

Sampling for evaluation of the program was developed using the Stratified Random Sampling procedure detailed in section Stratified Sampling. This procedure provides 90% confidence and +/- 10% precision with a significantly reduced sample than simple random sampling would require by selecting the highest saving facilities with certainty, thereby minimizing the variance that non-sampled sites can contribute to the overall results.

The participant population for the offering was divided into four strata. The strata boundaries, sample frames and sample statistics are in Table 17-8 below.

TABLE 17-8 PROGRAM SAMPLE DESIGN

	Stratum 1	Stratum 2	Stratum 3	Stratum 4	Totals
Strata boundaries (kWh)	< 5,000	5,001 - 20,000	20,001 - 50,000	> 50,001	**NA**
Number of projects	45	42	21	13	**121**
Total kWh savings	89,257	414,219	749,996	1,128,639	**2,382,110**
Average kWh Savings	1,983	9,862	35,714	86,818	**15,824**
Standard deviation of kWh savings	1,418	3,843	10,460	42,834	**24,257**
Coefficient of variation	0.71	0.39	0.29	0.49	**1.53**
Final design sample	10	11	11	8	**40**

TABLE 17-9 EXPECTED SAVINGS FOR SAMPLED/NON-SAMPLED PROJECTS BY STRATUM

Stratum	Sample Expected Savings	Total Expected Savings
1	30,251	89,257
2	116,583	414,219
3	445,157	749,996
4	747,040	1,128,638
Total	1,339,032	**2,382,110**

The achieved sampling precision was ±9.2% at 90% confidence.

17.3.3 KIT PROJECTS

Savings for lighting and water heating measures in the kits was assessed using the NO TRM V6.1.

TABLE 17-10 APPLICABLE TRM SECTIONS

Measure	TRM Section
LED A-Lamps	D.6
Low-Flow Faucet Aerators 1.0 GPM	D.2.2
Low-Flow Faucet Aerators 1.5 GPM	D.2.3
Advanced Power Strips	D.7.6
LED 'Exit' sign	D.6

To determine gross realization rates, the Evaluators performed a literature review to determine ISRs. The tables below shows the literature review results per measure.

TABLE 17-11 ISR FOR OFFICE KIT MEASURES

Measure	ISR
LED lamp	92.9%
Aerator 1.00 GPM	81.5%
Aerator 1.50 GPM	81.5%
Advanced Power Strip	71.0%
LED Exit Sign	92.9%

TABLE 17-12 ISR FOR RETAIL KIT MEASURES

Measure	ISR
LED lamp	92.9%
Aerator 1.00 GPM	81.5%
LED Exit Sign	92.9%

TABLE 17-13 ISR FOR RESTAURANT KIT MEASURES

Measure	ISR
LED lamp	92.9%
Aerator 1.00 GPM	81.5%
Aerator 1.50 GPM	81.5%
LED Exit Sign	92.9%

Savings for businesses with gas water heating were not claimed for hot water measures, Staff tracked the water heating type for each kit delivered and included this data in tracking provided to the Evaluators. In addition to asking questions related to in-service rates, the Evaluators also confirmed each businesses' water heating type during surveys. No discrepancies were found.

17.4 Evaluation Findings

17.4.1GROSS IMPACT FINDINGS

17.4.1.1 Traditional Project Realization

The Evaluators reviewed all project documentation, including invoices, spec sheets and site photos to verify the installation of the equipment. Energy and demand reduction calculations were reviewed to verify that they were consistent with the NO TRM and that all inputs were appropriate. Changes and corrections between *ex ante* and

ex post savings estimates were documented and realization rates based on verified savings were developed for each site. The realization rates for sites within each stratum were then applied to the non-sampled sites within their respective stratum.

TABLE 17-14 EXPECTED AND VERIFIED SAVINGS BY SAMPLED PROJECT

Project ID(s)	End Use	Ex Ante Gross Energy (kWh)	Ex Post Gross Energy (kWh)	Realization Rate
CIP_781	Lighting	39,196	69,870	178%
CIP_830	HVAC	3,493	5,955	170%
CIP_824	HVAC	7,452	12,506	168%
CIP_829	HVAC	3,609	5,955	165%
CIP_719	Lighting	44,204	65,687	149%
CIP_821	HVAC	5,578	7,824	140%
CIP_809	Lighting	10,068	10,793	107%
149350-2023-J2Q0	Lighting	4,362	4,592	105%
146971-2023-X0B8	Lighting	4,282	4,507	105%
147792-2023-Z7Q5	Lighting	2,780	2,869	103%
CIP_696	Refrigeration	7,346	7,350	100%
CIP_898	Miscellaneous	26,504	26,505	100%
CIP_591	HVAC	2,795	2,795	100%
CIP_740	HVAC	59,942	59,942	100%
CIP_741	HVAC	44,708	44,708	100%
CIP_742	HVAC	32,858	32,858	100%
CIP_744	HVAC	49,789	49,789	100%
CIP_745	HVAC	48,824	48,824	100%
CIP_746	HVAC	51,740	51,740	100%
CIP_751	HVAC	50,713	50,713	100%
CIP_762	Miscellaneous	11,519	11,519	100%
CIP_869	Refrigeration	2,770	2,770	100%
CIP_743	HVAC	50,121	50,121	100%
CIP_410	Lighting	132,459	132,459	100%
CIP_912	Lighting	1,825	1,825	100%
CIP_476	Lighting	17,193	17,176	100%
148754-2023-Q9Y9	Lighting	6,344	6,327	100%
CIP_664	Lighting	49,247	49,103	100%
CIP_710	Miscellaneous	10,020	9,925	99%
CIP_840	Compressed Air	189,029	186,361	99%
CIP_911	Lighting	10,196	9,928	97%
CIP_705	Lighting	13,308	12,909	97%

CIP_714	HVAC	11,258	10,825	96%
CIP_760	HVAC	2,828	2,700	95%
CIP_661	Lighting Controls	23,742	20,356	86%
CIP_712	Miscellaneous	71,054	48,523	68%
CIP_716	Miscellaneous	1,507	501	33%
CIP_722	Lighting	135,504	44,357	33%
CIP_747	HVAC	43,572	43,572	100%
CIP_771	Miscellaneous	42,514	42,514	100%
Total		**1,326,252**	**1,269,553**	**96%**

TABLE 17-15 SUMMARY OF KWH SAVINGS BY SAMPLE STRATUM

Stratum	Sample *Ex Ante* Gross Energy Savings (kWh)	Sample *Ex Post* Gross Energy Savings (kWh)	Stratum Realization Rate
1	30,251	34,469	114%
2	116,583	123,196	106%
3	445,157	493,785	111%
4	747,040	628,640	84%

17.4.1.2 Causes of Variance in Realization

Some sampled projects used annual hours of lighting operation and peak CF that were not correct for the space type. Verified savings calculations reflect hours of use and peak CF specific to the type of space the lamps were installed in, resulting in slightly different verified savings estimates. The largest cause of variance in realization rate was in baseline fixture wattages used in the ex-ante analysis. The *ex ante* estimates were calculated using an average wattage range that was on average higher than the wattages of the actual baseline equipment which is what was used in the *ex post* analysis. The table below shows projects with a realization rate that is ±10% from 100% and the cause of the variance in savings.

TABLE 17-16 CAUSES OF VARIANCE IN PROJECT SAVINGS

Project ID(s)	Expected kWh Savings	Verified kWh Savings	Realization Rate	Causes of Variance in Savings
CIP_781	39,196	69,870	178%	Ex Post analysis was based on an updated fixture count and fixture wattages.
CIP_830	3,493	5,955	170%	Ex Post savings were calculated following the New Orleans TRM. It is not clear how the ex ante savings estimates were calculated.
CIP_824	7,452	12,506	168%	Ex Post savings were calculated following the New Orleans TRM. It is not clear how the ex ante savings estimates were calculated.
CIP_829	3,609	5,955	165%	Ex Post savings were calculated following the New Orleans TRM. It is not clear how the ex ante savings estimates were calculated.
CIP_719	44,204	65,687	149%	Ex Ante savings estimates were based on custom HOU. Ex Post analysis used TRM deemed HOU. Additionally, the ex post savings analysis verified different fixture counts and wattages.

CIP_821	5,578	7,824	140%	Ex Post savings were calculated following the New Orleans TRM. It is not clear how the ex ante savings estimates were calculated.
CIP_661	23,742	20,356	86%	Ex post and ex ante analysis differed on control savings. Ex ante Control factors did not match the New Orleans TRM. Ex post pulled values from the TRM, additionally, the desk review verified slightly different fixture wattages and counts.
CIP_712	71,054	48,523	68%	Ex ante estimate used detached office facility type but during the desk review it was found that the most appropriate facility type was a religious facility which caused the decrease in savings.
CIP_716	1,507	501	33%	Ex ante estimate was based on the installation of 3 Evaporator Controllers when project documentation only shows the installation of one.
CIP_722	135,504	44,357	33%	Ex post analysis used an updated facility type for the fixtures. The ex ante estimate used exterior lighting HOU and CF for all fixtures and Ex Post updated the facility type to the most appropriate facility type.

17.4.1.3 Realization of Traditional Projects

Using the realization rates presented in

Table 17-15 Summary of kWh Savings by Sample Stratum

, the Evaluators extrapolated results from sampled sites to non-sampled sites in developing offering-level savings estimates. Table 17-17 presents results by stratum.

TABLE 17-17 REALIZATION BY STRATUM

Strat.	# Sites	*Ex Ante* Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	RR kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	RR kW
1	45	89,257	101,702	114%	21.10	26.78	127%
2	42	414,219	439,188	106%	92.71	99.44	107%
3	21	749,996	826,902	110%	85.63	105.27	123%
4	13	1,128,638	966,887	86%	55.48	51.01	92%
Total	**121**	**2,382,110**	**2,334,678**	**98%**	**254.93**	**282.50**	**111%**
Totals do not include business kits or OLM items.							

17.4.1.4 Energy Efficiency Kit Realization

Savings for kits were analyzed separately from the stratified sample of traditional projects. Since the expected energy savings were reported out in the tracking data at the kit level, the verified energy savings are reported at the kit level and not at the measure level, the results are as followed.

TABLE 17-18 BUSINESS KIT REALIZATION BY COMPONENT

Measure Kit	*Ex Ante* Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	RR kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	RR kW
Office Kit	22,786	19,801	87%	6.37	5.53	87%
Retail Kit	8,101	7,039	87%	2.31	2.00	87%
Restaurant Kit	1,514	1,315	87%	0.30	0.26	87%
Total	**32,400**	**28,156**	**87%**	**8.97**	**7.79**	**87%**

TABLE 17-19 KIT REALIZATION BY BUSINESS TYPE AND WATER HEATING FUEL MIX

Kit Type	Count Distributed	*Ex Ante* Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	RR kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	RR kW
Office - ER	10	22,120	19,222	87%	6.27	5.45	87%
Office - N. Gas	2	666	579	87%	0.10	0.09	87%
Retail - ER	4	7,551	6,562	87%	2.19	1.90	87%
Retail - N. Gas	1	549	477	87%	0.12	0.10	87%
Restaurant - ER	1	1,514	1,315	87%	0.30	0.26	87%
Totals	**18**	**32,400**	**28,156**	**87%**	**8.97**	**7.79**	**87%**

Verified savings differ from the expected estimates because the verified gross realization rates are lower than those used in the *ex ante* estimations.

Kits were distributed from the OLM in PY13.

17.4.1.5 Online Marketplace Realization

Savings from the OLM were analyzed separately from the stratified sample of traditional projects and kits. Results are as follows.

TABLE 17-20 OLM PURCHASES SAVINGS BY MEASURE

Measure	*Ex Ante* Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	RR kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	RR kW
Smart Thermostat	42,489	31,017	73%	-	-	NA
Faucet Aerator	5,070	4,056	80%	1.08	0.86	80.00%
Screw Based LED	1,624	1,624	100%	0.29	0.29	100.00%
LED Exit Sign	984	984	100%	0.14	0.14	100.00%
Low Flow Shower	146	104	71%	6.48	4.60	71.00%
Advanced Power Strip	2,509	1,631	65%	-	-	NA
Totals	**52,821**	**39,415**	**75%**	**7.99**	**5.89**	**73.77%**

TABLE 17-21 VERIFIED SAVINGS

Project Type	*Ex Ante* Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	RR kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	RR kW
Non-Kit Project	2,401,233	2,332,586	97%	260.25	282.50	109%
Kit Project	32,400	28,156	87%	8.97	7.79	27%
OLM	52,821	39,415	75%	7.99	5.89	74%
Total	**2,486,454**	**2,400,157**	**97%**	**277.21**	**296.19**	**107%**

The overall verified energy savings is 2,400,157 kWh and the peak demand reduction is 296.19 kW resulting in realization rates of 97% and 107% respectively.

17.4.1.6 Avoided Replacement Cost

The Evaluators have added the benefits of avoided replacement costs (ARC). The table below summarize the ARC by measure in Small C&I Solutions.

Information on methodology can be found in Section 3.4.1.3 Avoided Replacement Costs.

TABLE 17-22 SUMMARY OF ARC FOR SMALL C&I SOLUTIONS

Measure	*Ex Post* Gross ARCs ($)	*Ex Post* Net ARCs ($)	NPV ARCs ($)
HVAC	$0	$0	$0
Linear LED	$18,720	$18,720	$18,720
Screw Based LED	$2,160	$2,160	$2,160
LED Exit Sign	$0	$0	$0
Lighting Controls	$0	$0	$0
Incentive Bonus	$0	$0	$0
LED Fixtures	$43,354	$43,354	$43,354
Door Gaskets	$0	$0	$0
Custom	$0	$0	$0
BMS	$0	$0	$0
AC Tune Up	$0	$0	$0
OLM Smart Thermostats	$0	$0	$0
Faucet Aerator	$0	$0	$0
Retail Business Kit	$0	$0	$0
Evaporator Fan Controllers	$0	$0	$0
Advanced Power Strips	$0	$0	$0
Office Business Kit	$0	$0	$0
OLM LED Exit Sign	$0	$0	$0
OLM Screw Based LED	$40	$40	$40
Restaurant Business Kit	$0	$0	$0
Chiller	$0	$0	$0
Smart Thermostats	$0	$0	$0
Low Flow Shower Heads	$0	$0	$0

Strip Curtains	$0	$0	$0
Compressed Air Optimization	$0	$0	$0
Insulation	$0	$0	$0
Total	**$64,273**	**$64,273**	**$64,273**

Sums may differ due to rounding.

17.4.2 NET IMPACT FINDINGS

Participant survey responses were used to estimate the net energy impacts for the Small C&I, Large C&I, PFI, Construction Solutions offerings combined. The methodology used is described in 3.2.2.

17.4.2.1 Net Savings Results

Net savings by measure can be found in Section 16.1 Summary.

17.4.2.2 Program Activity

In PY13, the offering had an expected energy savings of 2,486,454 kWh and an expected peak demand reduction of 277.21 kW. The expected savings are the result of three distinct delivery channels within the program, traditional retrofits (traditional), items purchased from the Energy Smart Online Market (OLM) Place. The count of participants and the expected savings from each channel is found in the table below.

TABLE 17-23 SMALL C&I SOLUTIONS SAVINGS EXPECTATION BY DELIVERY CHANNEL

Delivery Channel	Count of Project Components	*Ex Ante* Gross Energy Savings (kWh)	*Ex Ante* Gross Demand Reductions (kW)
Non-Kit	376	2,401,233	260.25
Kits	18	32,400	8.97
OLM	97	52,821	7.99
Total	**491**	**2,486,454**	**277.21**

TABLE 17-24 SMALL C&I SOLUTIONS SAVINGS EXPECTATION BY PROJECT COMPONENT

Participation Path	Project Component	# of Project Components	*Ex Ante* Gross Energy Savings (kWh)	*Ex Ante* Gross Demand Reductions (kW)
Non-Kit	Prescriptive	350	1,661,798	253.70
	Custom	26	739,435	6.56
Office Kit	Prescriptive	12	22,786	6.37
Restaurant Kit	Prescriptive	1	1,514	0.30
Retail Kit	Prescriptive	5	8,101	2.31
OLM	Prescriptive	97	52,821	7.99
Total		491	2,486,454	277.21

In PY13, the savings were largely made up of prescriptive measure offerings, which accounted for 70% of the expected energy savings. The measure counts below are off compared to the tables above as line items with no expected energy savings were included (incentive bonuses and the Hurricane Ida Relief Fund to increase incentives to customers).

TABLE 17-25 SMALL C&I SOLUTIONS SAVINGS EXPECTATION BY MEASURE TYPE

Project Component	Count of Measures	*Ex Ante* Gross Energy Savings (kWh)	Expected kW Savings	Percentage of Savings Contribution
HVAC	48	74,980	9.49	3%
Lighting	250	1,336,160	199.15	54%
Refrigeration	5	10,763	1.21	0%
Custom	10	0	0.00	0%
BMS	14	713,577	0.00	29%
AC Tune Up	7	41,608	15.47	2%
OLM	97	52,821	7.99	2%
Kit	5	8,101	2.31	0%
Evaporator Fan Controllers	1	1,507	0.17	0%
Kits	13	24,300	6.66	1%
Chiller	1	24,906	12.04	1%
Compressed Air	1	189,029	22.72	8%
Insulation	1	8,703	0.00	0%
Total	**453**	**2,486,454**	**277.21**	**100%**

Thirty-four percent of expected savings had a completion date listed as December of 2023 and January of 2024. PY13 saw a higher number of projects completed when compared to PY12.

TABLE 17-26 SMALL C&I SOLUTIONS PARTICIPATION SUMMARY COMPARISON

Project Year	# Projects	*Ex Ante* Gross kWh	kWh per Project
PY13	291	2,486,454	8,544
PY12	281	4,249,756	17,964

17.4.3 PROCESS FINDINGS

The Evaluators conducted staff interviews and administered online marketplace and small commercial solutions participant surveys. The following sections summarizes the findings from interviews and the participant surveys.

17.4.3.1 Staff and Implementer Interviews

The following section summarizes the key findings from in-depth interviews with two ENO program staff, and two APTIM staff; ENO staff participated in one interview and APTIM staff participated in a second interview. These in-depth interviews aimed to learn more about Small Commercial Solutions program design and operations, and the successes and challenges experienced during PY13. Interviews lasted approximately 60 minutes and were conducted using the Microsoft Teams platform. The evaluators recorded all interviews with participant permission. The following narrative summarizes these interviews.

17.4.3.1.1 *Program Description and Implementation*

The Small C&I Solutions program provides incentives to small business owners to help overcome the first-cost barrier that small businesses face in adopting energy efficiency improvements. By offering enhanced financial incentives, the program generates significant cost-effective energy savings for small businesses using added market-segmented strategies that encourage the adoption of diverse efficiency measures in target sub-sectors.

Staff noted that PY13 witnessed a rebound in program interest following the initial downturn that resulted from COVID-19. However, despite some increased interest, the program continues to struggle. In an attempt to boost participation and meet goals earlier in the year, staff restructured the completion bonus system to incentivize earlier project completion, namely a 25% bonus for projects completed by September 30th. Despite this incentive, staff noted that the program was not on track to complete its goal. Staff attribute part of the slow program performance to the new program contract and the fact that recruitment could not start at the end of PY13, as done in previous years, but rather had to wait for the official new contract data on January 1, 2023. They explained that this delay slowed down the project pipeline, which most impacted large commercial programs.

17.4.3.1.2 *Program Changes*

Programmatic changes include new compressed air leak repair measures as well as small business assessment and direct install measures. Rather than providing a small business kit, staff now offer small business direct install programs in which internal implementation staff conduct and assessment, install direct install measures, and refer customers to trade allies if necessary. These changes came about in response to EISA backstop and lighting restrictions as well as previous low participation from small businesses more generally.

Moving forward, staff are exploring changes and measure additions that will compensate for previous lighting-related savings that are now ineligible.

17.4.3.1.3 *Trade Allies*

Entergy New Orleans has a commercial trade ally network of about 75-90 trade allies. Of these trade allies, there are about thirteen highly active market actors. In general, trade allies generate their own leads and are responsible for much of the program marketing. Program staff assign project leads that come through Entergy either via call center or direct install program, based on trade ally capacity and previous performance.

17.4.3.2 Participant Survey

The Evaluators conducted a mixed-mode survey with customers who participated in Small C&I Solutions, Large C&I Solutions, Publicly Funded Institutions, and CI Construction Solutions to gain insight into customer satisfaction and feedback. All customers with valid email addresses included in the program's tracking data were emailed an invitation to take the survey (n=57). Five participants responded to survey attempts. Due to the low sample size, responses were analyzed together for all four programs (Small C&I Solutions, Large C&I Solutions, Publicly Funded Institutions, and CI Construction Solutions) (Table 17-27).

Table **17-28** displays respondents' firmographics.

TABLE 17-27 PARTICIPANT SURVEY RESPONSE RATE

Metric	Count
Number of customers contacted by email or phone	57
Responses	5
Small C&I	1
Large C&I	2
PFI	1
Construction	1

TABLE 17-28 RESPONDENT FIRMOGRAPHICS

Response	Percentage of Respondents	Count
Ownership of facility		
Rent	20.0%	1
Own and occupy the facility	20.0%	1
Own and lease the facility to someone else	60.0%	3
Facility Type		
K-12 school	20.0%	1
Restaurant	20.0%	1
Retail	20.0%	1
Office	20.0%	1
Other	20.0%	1

Most respondents were satisfied with their participation experience. All respondents indicated that cost of equipment is a major barrier to installing energy efficient equipment. Other barriers include a lack of technical knowledge (n=2), long payback period (n=2), and not having authority to make upgrades (n=1). Respondents suggested Entergy New Orleans increase incentives and/or offer financing options (n=3), be more transparent about the costs of the equipment and the projected savings (n=1) and provide more training to building owners (n=1).

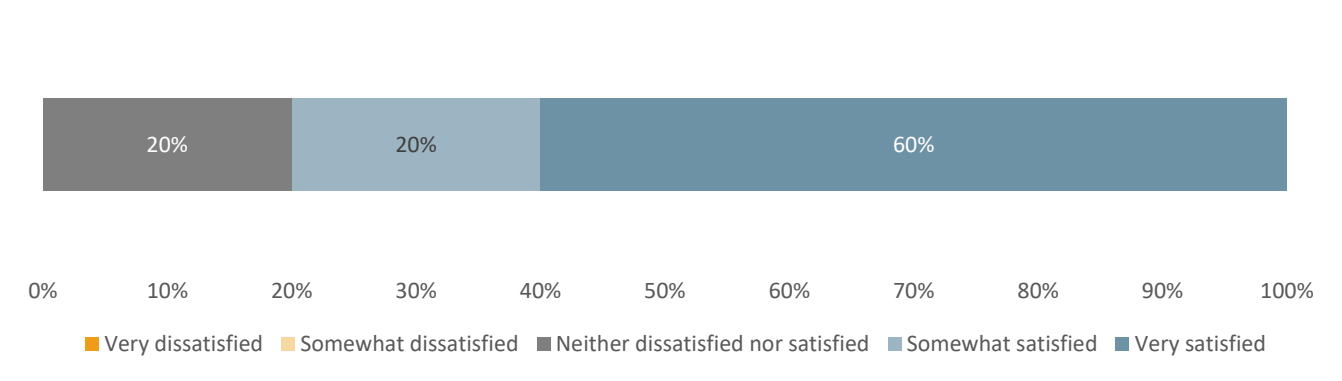


FIGURE 17-3 PROGRAM SATISFACTION (N=5)

17.4.3.3 Near Participant Trade Ally Interviews

Evaluators conducted interviews about participation in the Energy Smart Small Commercial & Industrial Solutions program with near-participant trade allies to gather feedback about trade ally awareness and general knowledge of energy efficiency actions and Energy Smart's programs, as well as barriers to program engagement. "Near-participant" trade allies are trade allies who have previously participated in the Energy Smart program or have expressed interest in program engagement, but not yet enrolled.

Energy Smart tracking data for the Small Commercial & Industrial Solutions savings program included 65 unique trade ally contacts in the program. Of these contacts, 48 had valid contact information. Trade allies were contacted via phone and email three times and invited to complete an interview. Six near-participants responded to an interview for a response rate of 13%.

17.4.3.3.1 *Program Strengths*

The biggest strengths of the Energy Smart program, specifically identified by four of the trade allies, are the financial incentives that help offset the costs of implementing energy efficiency measures, making them more affordable for businesses. They also appreciate the streamlined application process facilitated by online portals, with two trade allies expressing that it saves them time and effort.

> *The portal, the application seems pretty straightforward. I'm just pretty used to it. The worksheet too…it's pretty straightforward so far. I never have any issue with as far as submittal paperwork and stuff. – Distributor, lighting*

All six trade allies discussed the support and responsiveness of APTIM and Entergy New Orleans throughout the process as another strength. They feel that the program provides opportunities for collaboration with utility companies and other organizations, which can help trade allies expand their business and offer new services.

> *"I don't remember there being too many issues with New Orleans. The people were easy to work with. I find that with utility companies, they all want to help, for lack of a better phrasing is they want to give away the money." – Manufacturer, Lighting Systems*

> *"They're constantly sending emails out, just giving us updates of what's happening. There's extra money just sending us leads on opportunities that are out there, we get leads for us to even go after. And then of course, they include us with participating in job fairs. I think we just did one a month or so ago. they kicked it back off since Covid we participated. So, I think they're doing a great job of keeping in touch with us enough to where they're not overbearing, to where I'm deleting the emails. You know, how some things can get that way. but I think they're doing the right amount right now." – Manufacturer, HVAC*

17.4.3.3.2 *Program Challenges*

Trade allies call out several challenges they face in participating in the program. Two of the six trade allies shared that payment delays tie up funds and hinder business progress. Four of the allies interviewed discussed varying incentive amounts that affect the profitability of projects. All trade allies shared perspectives around the complexity of the process presenting a challenge from time to time, especially when dealing with multiple utilities or third-party implementers. These challenges highlight the need for streamlining the process to address payment delays and provide transparent communication thereby ensuring that incentives remain attractive and profitable for trade allies and their customers.

> *"Well, [incentives often cover] 75% of the job cost. So, the customer just has to come up with the 25%. Now what would help is if Entergy would speed up the pay. Getting the paychecks. Because sometimes it could take up to six weeks to get paid on a job. And I'm not a real rich man. Sometimes things get tight. That's the only downfall I see on the program." – Installer, Lighting Systems*

The four trade allies that work in lighting sometimes face significant challenges related to changing product requirements and the delisting of products from the Design Lights Consortium (DLC). This often leads to missed rebates, unexpected costs for these trade allies as well as challenges in meeting program requirements.

> *"The product requirements sometimes could be based on DLC rating and Energy Star, but those could be updated every year or every two years. So, once they update it, if they see the product is delisted from DLC, [the utility is] probably not going to pay. This could be tough sometimes because there's a time period when we know sometimes, we order the material already and we install it, but during the installation time, DLC decided took it off the list for whatever reason. That could be troublesome sometimes. Then we're missing out on money." – Distributor, Lighting Systems*

Two trade allies discussed the challenges of the requirement for detailed information and pictures for kWh-based programs, especially when relying on third party agents in the field.

> *"Getting pictures can be difficult. I understand why they're requesting pictures, but sometimes talking with clients or agents makes it difficult to get pictures because I can send out sample pictures all day long of what I need. Getting things back is very difficult. It's not like I can just go pop over there and take a picture and be good… The pictures and the detailed information that they require for the workbooks and stuff can be sometimes challenging to put together."*
> *– Manufacturer, Lighting Systems*

17.4.3.3.3 *Deeper Trade Ally Engagement*

Trade allies share multiple ideas around increasing engagement in the program. All six trade allies suggested that increasing the level of incentives offered by energy efficiency programs could make participation more attractive and profitable.

> *"If we can get higher rebate, that would be awesome." – Distributor, Lighting Systems*

Simplifying and streamlining the program application and approval processes could make it easier for trade allies to participate, as stated by two out of six trade allies. All six trade allies interviewed recommend providing comprehensive support, including specific recommendations, contacts, and training to assist trade allies in their execution of the program.

> *"I live in Mississippi, and so I opted to just do the Entergy Mississippi, because they streamline it a lot better. I like the way they do the program. I just have to deal with one person. If I got a problem, he helps me do whatever I need to… He'll make a suggestion if we need to change something. He knows how to do all that. I don't have to do anything. Basically just pick the job up. He does the audits, and I'm there with him. And then I just get the materials and have it installed. It's pretty easy for me. Whereas in Arkansas, I had to do everything, do the audits, send in the paperwork. We were doing so many deals over there. We had close to 200 deals in six months, and it got backed up and customers were saying, well, what's going on?" – Installer, Lighting Controls*

Half of the trade allies, three out of six, expressed the desire for clear, concise, and engaging communication from Entergy New Orleans that they can share with potential and current customers. Allies shared that

inconsistent timing of communications or those that look like a big block of text and not engaging or helpful for the allies or their customers.

> *"There are some utility companies that I haven't done business with for a little while…but I get touch base emails from them that are definitely a little bit more on the flashy and engaging side. Some of the emails that I've seen from Entergy are very plain Jane, and unfortunately, as an ADHD person, if it's boring and I know I don't need it, I'm probably not reading it. It probably shows that I opened the email because I'll at least open every email to kind of do a quick phase, but there'll been no engagement from me to go beyond that." – Manufacturer, Lighting Controls*

All the trade allies interviewed agreed that fostering partnerships and collaborations with other non-competing organizations in the energy efficiency sector could create opportunities for trade allies to expand their presence. These allies felt that increasing visibility and marketing opportunities for trade allies could attract more business.

> *"A lot of companies like me don't self-execute everything. There would be some way of getting us creating some kind of a trade. So we could say, hey, look, we're going to do this job. Do you have some subcontractors? But these are the subcontractors Entergy recommends. And we could go to them and say, hey, we're running this job, and [they are not] a competitor, right? So, we're a controls company. There's other controls company, but I don't want a competitor. I want the subcontractor that both me and my competitor could go get pricing to go do pull wire or something or go weld up piping or go do the field labor portion of it. And then I just come in as the manufacturer and do the programming [and] make sure it's installed right. So like a network of subcontractors that could work for all the trade allies." – Manufacturer, Energy Optimization*

> *"They should have like a bid list like all the other agencies. A client can go on their database [and submit a] project that needs done. So they post it on an Energy Smart website. That way all of the contractors can see, hey, this is a potential project and they should have categories for the super companies or the tiny companies. And the super [companies] should be prevented from bidding on this tiny work so that'll give the smaller allies something to do and the giant companies could work on big work." – Installer, Lighting Controls*

17.5 Data Tracking Review

The Evaluators reviewed the tracking dat. The following parameters were missing or incomplete for the program.

- Measure Specific Information: The tracking data lacked pre and post measure information such as fixture codes, fixture wattages, equipment size, and equipment efficiency.

The Evaluators note that a supplemental tracking dataset was provided for this program and a few others. This data had some additional fields.

17.6 Key Findings & Recommendations

Below are key findings for this program after the evaluation.

- High Satisfaction Levels: Survey respondents expressed overall satisfaction with the program, with approximately 80% indicating positive feedback. Notably, one-third of participants reported observing tangible energy savings reflected in their utility bills subsequent to program participation, indicating a perceived effectiveness in achieving energy efficiency goals.
- Barriers to Energy Efficiency Adoption: Among the most commonly cited barriers to embracing energy efficiency measures were the substantial upfront costs associated with acquiring energy-efficient equipment and a general lack of awareness regarding available incentives and support mechanisms. Addressing these hurdles is essential for fostering wider adoption of energy-saving technologies and practices among program participants.
- Suggestions for Program Enhancement: Survey respondents offered a range of suggestions aimed at enhancing the program's efficacy. Recommendations included the implementation of in-person assessments and support services, the expansion of rebate offerings to encompass a broader spectrum of energy-efficient upgrades, and intensified efforts in education and training initiatives to empower consumers with knowledge on energy-saving measures.
- Positive Perception Among Trade Allies: Near participant trade allies exhibited a favorable view of the Small Commercial & Industrial Solutions program, recognizing its potential to facilitate small businesses in overcoming initial cost barriers associated with energy efficiency enhancements. Trade allies perceived the program as instrumental in enabling significant energy savings and enhancing energy efficiency standards across diverse industry sectors.
- Identified Challenges in Program Engagement: Despite acknowledging the program's potential benefits, near participant trade allies highlighted two primary challenges impeding their engagement. These challenges included a need for enhanced clarity and information dissemination regarding program offerings and a perceived absence of tailored options catering to the specific needs and capacities of smaller businesses. Addressing these concerns is crucial for fostering greater participation and uptake of the program among target stakeholders.

Below are recommendations for this program after the PY13 evaluation.

- Clarification of Program Requirements: Trade allies expressed a need for clearer information regarding program requirements, particularly concerning approvals from the Design Lights Consortium (DLC). There was notable confusion among trade allies regarding DLC approvals, leading to uncertainties and potential unexpected costs during project execution. To address this, it is recommended to proactively educate trade allies about all program requirements to ensure they are well-informed and adequately prepared, thereby minimizing the risk of surprises or additional expenses for themselves or their clients. Enhanced Marketing Support for Trade Allies: To bolster the effectiveness of marketing efforts, it is suggested to provide enhanced marketing support to trade allies. This includes furnishing them with materials that not only enhance their credibility but also aid in elucidating the benefits and offerings of the program to end customers. Additionally, facilitating co-branding opportunities for trade allies alongside ENO in promotional materials can further bolster their visibility and credibility. Moreover, ensuring the availability of clear and easily understandable marketing materials equips trade allies with the resources needed to effectively communicate the value proposition of the program to their customers, thereby fostering greater engagement and participation.

18 LARGE C&I SOLUTIONS

18.1 Summary

The tables below report *ex ante* gross, *ex post* gross, *ex post* net energy savings (kWh) (both annual and lifetime), demand reductions (kW), participation, and incentive spend, by measure, where applicable. Additionally, the tables above represent evaluation findings for each measure, whereas the analysis described in this chapter summarizes the findings of the evaluation stratum.

FIGURE 18-1 PY13 LARGE C&I SOLUTIONS ENERGY SAVINGS (KWH)

Measure	*Ex Ante* Gross Savings (kWh)	Realization Rate (kWh)	*Ex Post* Gross Savings (kWh)	NTG	*Ex Post* Net Savings (kWh)
HVAC	313,910	124%	390,095	96%	374,492
BMS	4,787,945	96%	4,581,612	96%	4,398,347
Chiller	1,223,361	111%	1,361,936	96%	1,307,458
Linear LED	5,662,432	119%	6,728,207	96%	6,459,079
LED Fixtures	2,010,206	126%	2,538,094	96%	2,436,570
Incentive Bonus	0	100%	0	96%	0
Screw Based LED	736,210	115%	845,628	96%	811,803
Custom	0	100%	0	96%	0
Air Compressor	187,412	162%	302,986	96%	290,867
VFD	1,292,258	84%	1,081,409	96%	1,038,152
Lighting Controls	12,848	162%	20,771	96%	19,940
LED Exit Sign	24,732	106%	26,272	96%	25,221
Kitchen Exhaust Controls	191,378	162%	309,397	96%	297,022
Coil Cleaning	2,555,158	104%	2,652,612	96%	2,546,507
Exterior LED	29,926	102%	30,468	96%	29,250
Door Gaskets	8,550	197%	16,827	96%	16,154
Total	**19,036,327**	**110%**	**20,886,316**	**96%**	**20,050,863**

Sums may differ due to rounding.

TABLE 18-1 PY13 LARGE C&I SOLUTIONS DEMAND REDUCTIONS (KW)

Measure	*Ex Ante* Gross Demand (kW)	RR (kW)	*Ex Post* Gross Demand (kW)	NTG	*Ex Post* Net Demand (kW)
HVAC	56.35	96%	54.21	96%	52.04
BMS	103.29	73%	75.13	96%	72.12
Chiller	166.27	278%	461.57	96%	443.11
Linear LED	985.27	156%	1,534.56	96%	1,473.18
LED Fixtures	153.53	191%	292.51	96%	280.81
Screw Based LED	149.57	196%	293.76	96%	282.01
Air Compressor	0.00	100%	0.00	96%	0.00
VFD	170.67	100%	171.28	96%	164.43
Lighting Controls	0.71	172%	1.23	96%	1.18
LED Exit Sign	1.71	194%	3.32	96%	3.19
Kitchen Exhaust Controls	25.04	172%	43.18	96%	41.46
Coil Cleaning	270.37	164%	444.05	96%	426.29
Exterior LED	0.00	100%	0.00	96%	0.00
Door Gaskets	1.20	301%	3.61	96%	3.47
HVAC	56.35	96%	54.21	96%	52.04
Total	**2,083.99**	**162%**	**3,378.43**	**96%**	**3,243.29**

Sums may differ due to rounding.

TABLE 18-2 PY13 LARGE C&I SOLUTIONS LIFETIME SAVINGS SUMMARY

Measure	EUL	*Ex Post* Gross Lifetime Energy Savings (kWh)	*Ex Post* Net Lifetime Energy Savings (kWh)
HVAC	15	5,851,430	5,617,373
BMS	15	68,724,176	65,975,209
Chiller	20	27,238,717	26,149,168
Linear LED	15	100,923,111	96,886,187
LED Fixtures	15	38,071,414	36,548,557
Screw Based LED	1	845,628	811,803
Air Compressor	15	4,544,797	4,363,005
VFD	15	16,221,132	15,572,287
Lighting Controls	8	166,170	159,523
LED Exit Sign	15	394,082	378,318
Kitchen Exhaust Controls	15	4,640,961	4,455,323
Coil Cleaning	10	26,526,116	25,465,071
Exterior LED	15	457,024	438,743
Door Gaskets	4	67,307	64,615
Total	**11**	**294,672,064**	**282,885,182**

Sums may differ due to rounding.

TABLE 18-3 PY13 LARGE C&I SOLUTIONS COUNT OF MEASURES AND INCENTIVE SPEND

Measure	Participation (Count of Measures)	Incentive Spend ($)
HVAC	6	$32,181
BMS	20	$550,052
Chiller	6	$168,590
Linear LED	88	$509,181
LED Fixtures	70	$192,760
Incentive Bonus	80	$385,772
Screw Based LED	18	$26,645
Air Compressor	1	$22,489
VFD	3	$155,071
Lighting Controls	1	$480
LED Exit Sign	4	$2,520
Kitchen Exhaust Controls	4	$23,988
Coil Cleaning	8	$275,387
Exterior LED	2	$224
Door Gaskets	3	$1,232
Total	**314**	**$2,346,572**

Sums may differ due to rounding.

18.2 Program Description

Large Commercial & Industrial Solutions (Large C&I Solutions) program provides financial incentives and technical service to non-residential customers whose average monthly peak demand exceeds 100 kW to implement energy-savings measures. The program is designed to help this customer segment overcome barriers in energy improvement, such as higher initial cost of efficient equipment and a lack of technical knowledge or resources.

The incentives provided are summarized below in the table below.

TABLE 18-4 LARGE C&I SOLUTIONS SUMMARY OF OFFERING INCENTIVES

Measure	Incentive
Prescriptive	Various based on $ per unit
Custom Lighting	$0.10 per kWh Saved
Custom Non-Lighting	$0.12 per kWh Saved
Retro-commissioning	$0.04-$0.07/kWh Saved

18.2.1PROGRAM DELIVERY CHANNELS AND EXPECTED SAVINGS

The evaluation approach for PY13 included the following activities, database review, desk reviews, site visits, participants surveys and staff interviews.

PY13 saw an 30% decrease in projects completed but saw a 25% decrease in expected savings. The program had 94 projects resulting in an expected energy savings of 19,036,327 kWh and an expected peak demand reduction of 2,083.99 kW.

TABLE 18-5 LARGE C&I SOLUTIONS EXPECTED SAVINGS SUMMARY

Count of Projects	*Ex Ante* Gross Energy Savings (kWh)	*Ex Ante* Gross Demand Reductions (kW)
95	19,036,327	2,083.99

The table below shows the split of savings coming from custom and prescriptive projects.

TABLE 18-6 LARGE C&I SOLUTIONS SAVINGS EXPECTATIONS BY PROJECT COMPONENT

Project Component	Count	*Ex Ante* Gross Energy Savings (kWh)	*Ex Ante* Gross Demand Reductions (kW)
Prescriptive	81	5,697,765	1,133.35
Custom	68	13,338,562	950.65
Total	**149**	**19,036,327**	**2,083.99**
Project count is high due to projects with both prescriptive and custom components.			

18.2.2TIMING OF PROJECTS

According to the tracking data, in PY13 54% of ex ante kWh savings had a project install date between November and December of 2023 with the largest single start month being December of 2023 which accounted for 34% of total program ex ante kWh.

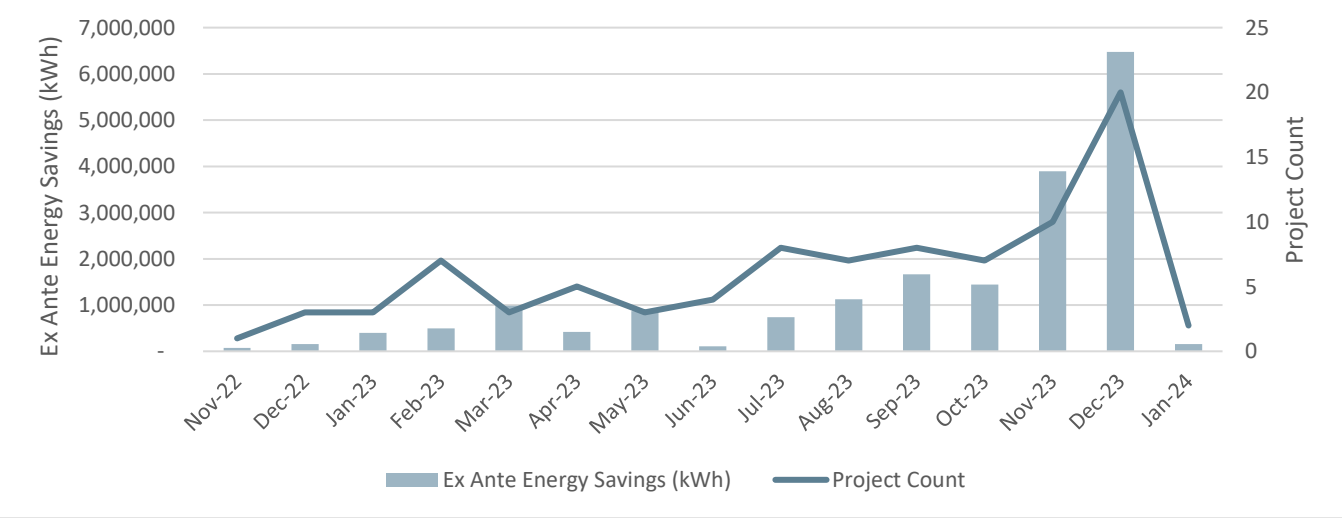


Figure 18-2 below outlines ex ante kWh and project count by the project reported start date for projects claimed in PY13.

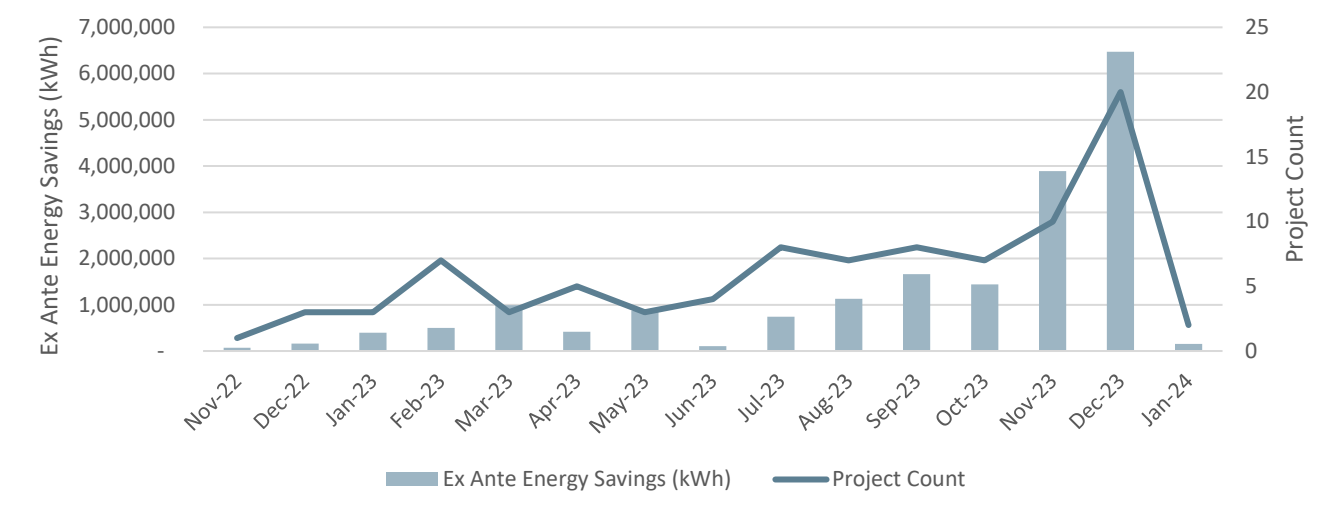


FIGURE 18-2 LARGE C&I PROGRAM PARTICIPATION BY START MONTH

18.2.3TRADE ALLIES

In PY13, the program saw projects completed by 36 different trade allies. The contribution to savings by Trade Ally is outlined below in Table 18-7.

TABLE 18-7 LARGE C&I TRADE ALLY CONTRIBUTION

Trade Ally	Ex Ante kWh	Project Count	Ex Ante kWh %
Trade Ally 1	31,275	1	0.2%
Trade Ally 2	201,756	1	1.1%
Trade Ally 3	928,156	7	4.9%
Trade Ally 4	439,481	2	2.3%
Trade Ally 5	199,613	1	1.0%
Trade Ally 6	14,197	1	0.1%
Trade Ally 7	1,150,854	3	6.0%
Trade Ally 8	101,085	1	0.5%
Trade Ally 9	2,555,158	8	13.4%
Trade Ally 10	3,459	2	0.0%
Trade Ally 11	48,856	2	0.3%
Trade Ally 12	640,371	6	3.4%
Trade Ally 13	104,278	1	0.5%
Trade Ally 14	116,566	1	0.6%
Trade Ally 15	80,862	2	0.4%
Trade Ally 16	2,473,468	16	13.0%
Trade Ally 17	346,907	1	1.8%

Trade Ally 18	425,099	6	2.2%
Trade Ally 19	2,255,650	4	11.8%
Trade Ally 20	188,839	3	1.0%
Trade Ally 21	540,322	5	2.8%
Trade Ally 22	65,981	1	0.3%
Trade Ally 23	55,718	1	0.3%
Trade Ally 24	4,599,974	8	24.2%
Trade Ally 25	135,660	1	0.7%
Trade Ally 26	385,149	2	2.0%
Trade Ally 27	65,652	1	0.3%
Trade Ally 28	71,600	1	0.4%
Trade Ally 29	213,491	1	1.1%
Trade Ally 30	8,550	2	0.0%
Trade Ally 31	575,708	1	3.0%
Trade Ally 32	12,594	1	0.1%
Trade Ally 33	31,275	1	0.2%
Trade Ally 34	201,756	1	1.1%

18.2.4GOAL ACHIVEMENT

In PY13, the program's net energy savings obtained 98% of the kWh goal. The program's net peak demand reduction obtained 140% of the peak demand target.

TABLE 18-8 LARGE C&I PY13 SAVINGS GOALS

Ex Post Gross Energy Savings (kWh) Goal	% to kWh Goal	*Ex Post* Gross Energy Savings (kWh)
35,008,874	60%	20,886,316

18.3 EM&V Methodology

Evaluation of the program involved the following:

- Stratified Random Sampling (as detailed in section (as detailed in Section 3.3.1) and by selecting large saving sites with certainty.
- On-site verification for seven projects, desk reviews of all 27 sampled projects; and
- Interviewing program participants and trade allies.

18.3.1SITE VISITS

The on-site inspections were used to verify installations and to determine any changes to the operating parameters since the measures were first installed. Energy savings was estimated using proven techniques, including engineering calculations using industry standards to determine energy savings.

18.3.2SAMPLE DESIGN

Sampling was developed using the Stratified Random Sampling procedure detailed in Section 3.3. This procedure provides 90% confidence and +/- 10% precision with a significantly reduced sample than simple random

sampling would require by selecting the highest saving facilities with certainty, thereby minimizing the variance that non-sampled sites can contribute to the overall results.

The participant population was divided into five strata. Table 18-9 summarizes the strata boundaries and sample frames for the program and

Table 18-10 summarizes expected savings of both the sample and population. The achieved sampling precision was ±9.4% at 90% confidence.

TABLE 18-9 LARGE C&I PROGRAM SAMPLE DESIGN

	Stratum 1	Stratum 2	Stratum 3	Stratum 4	Stratum 5	Totals
Strata boundaries (kWh)	< 50,000	50,001 - 200,000	200,001 - 500,000	500,001 - 1,000,000	>1,000,001	**NA**
Number of projects	28	41	16	8	2	**95**
Total kWh savings	530,716	4,507,297	5,207,233	5,675,264	3,115,817	**19,036,327**
Average	19,574	109,934	325,452	709,408	1,557,909	**200,565**
Standard deviation	15,915	48,782	82,927	153,055	636,807	**292,356**
Coefficient of variation	0.81	0.44	0.25	0.22	0.41	**1.46**
Final design sample	11	9	3	2	2	**27**

TABLE 18-10 LARGE C&I EXPECTED SAVINGS FOR SAMPLED AND NON-SAMPLED PROJECTS BY STRATUM

Strata	Sample Expected Savings	Total Expected Savings	% Savings in M&V Sample
Stratum 1	208,762	530,716	1%
Stratum 2	1,056,276	4,507,297	6%
Stratum 3	1,041,434	5,207,233	5%
Stratum 4	1,473,448	5,675,264	8%
Stratum 5	3,115,817	3,115,817	16%
Totals	**6,895,737**	**19,036,327**	**36%**

18.4 Evaluation Findings

18.4.1GROSS IMPACT FINDINGS

18.4.1.1 Large C&I Site Level Realization

Desk reviews of documentation for all sites chosen within each stratum were performed: All project documentation, calculations, invoices, photos, were carefully examined to verify the installation and operation of equipment. In addition, the Evaluators visited two sites to verify installation and operation of measures and

collect data. Where there was uncertainly, the Evaluators contacted staff or site contacts for clarification. This information was then used to verify savings or adjust *ex ante* estimates based on findings. The realization rates for sites within each stratum were then applied to the non-sampled sites within their respective stratum. Table 18-11 presents realization at the stratum level.

TABLE 18-11 SUMMARY OF KWH SAVINGS FOR LARGE C&I OFFERING BY SAMPLE STRATUM

Stratum	Sample Ex Ante Gross Energy Savings (kWh)	Sample Ex Post Gross Energy Savings (kWh)	Realization Rate
1	208,762	408,885	196%
2	1,056,276	1,707,667	162%
3	1,041,434	1,117,311	107%
4	1,473,448	1,224,755	83%
5	3,115,817	2,465,029	79%
Total	**6,895,737**	**6,923,648**	**100%**

Table 18-12 shows the expected and verified energy savings for the sampled projects.

TABLE 18-12 LARGE C&I EXPECTED AND VERIFIED SAVINGS BY SAMPLED PROJECT

Project ID(s)	Facility Type	Expected kWh Savings	Verified kWh Savings	Realization Rate
CIP_414	Chiller	201,756	368,424	183%
CIP_519	HVAC	199,613	191,603	96%
CIP_693	Linear LED	21,382	32,895	154%
CIP_599	Linear LED	953,308	907,460	95%
CIP_600	Linear LED	186,976	164,565	88%
CIP_627	Screw Based LED	101,085	84,903	84%
CIP_690	Coil Cleaning	63,753	63,753	100%
CIP_691	HVAC	1,197	1,194	100%
CIP_692	HVAC	2,262	2,232	99%
CIP_702	Linear LED	49,264	232,060	471%
CIP_732	LED Fixtures	13,069	13,069	100%
CIP_706	Linear LED	38,416	34,417	90%
CIP_711	Linear LED	346,907	256,116	74%
CIP_720	Linear LED	13,576	13,260	98%
CIP_721	Coil Cleaning	492,771	492,771	100%
CIP_733	Linear LED	31,598	31,598	100%
CIP_738	Linear LED	4,019	3,627	90%
CIP_768	LED Fixtures	59,347	61,141	103%
CIP_752	Screw Based LED	2,008,199	2,021,982	101%
CIP_755	VFD	15,961	20,529	129%
CIP_789	Linear LED	116,423	118,531	102%
CIP_777	BMS	94,732	71,686	76%

CIP_778	BMS	55,487	36,405	66%
CIP_790	Linear LED	520,140	317,295	61%
CIP_807	LED Fixtures	9,512	9,228	97%
CIP_813	LED Fixtures	178,861	915,081	512%
CIP_882	BMS	1,107,618	443,047	40%

18.4.1.2 Program-level Realization

Using the realization rates presented in Table 18-11 the Evaluators extrapolated results from sampled sites to non-sampled sites in developing offering-level savings estimates. Table 18-13 presents results by stratum.

TABLE 18-13 LARGE C&I SOLUTIONS PROGRAM LEVEL REALIZATION RATE BY STRATUM

Stratum	# Sites	*Ex Ante* Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	kWh RR	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	kW RR
1	27	530,716	1,009,666	190%	82.91	253.36	306%
2	41	4,507,297	7,145,317	159%	470.73	799.38	170%
3	16	5,207,233	5,548,927	107%	539.47	1,210.75	224%
4	8	5,675,264	4,717,376	83%	556.54	558.54	100%
5	2	3,115,817	2,465,029	79%	434.34	556.39	128%
Total	**94**	**19,036,327**	**20,886,316**	**110%**	**2,083.99**	**3,378.43**	**162%**

Table 18-14 shows the verified savings across the program.

TABLE 18-14LARGE C&I SOLUTIONS PROGRAM LEVEL REALIZATION

Ex Ante Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	kW Realization Rate
19,036,327	20,886,316	110%	3,455.33	6,815.61	197%

18.4.1.3 Causes of Savings Deviations

For illustrative purposes, the Evaluators have summarized these adjustments to kWh savings in Table 18-15.

TABLE 18-15 LARGE C&I CAUSES OF VARIANCE IN SAVINGS

Project ID(s)	Expected kWh Savings	Verified kWh Savings	Realization Rate	Causes of Variance in Savings
CIP_414	201,756	368,424	183%	Ex ante estimate calculated savings based on a water-cooled chiller. The evaluators verified through a desk review that the installed chiller was an air-cooled chiller which caused an increase in savings.
CIP_693	21,382	32,895	154%	During the desk review, it was found that the ex ante estimate did not account for multi lamp fixtures but rather only used singular lamp wattages and not the total fixture wattages. The ex post analysis accounted for the total baseline fixture wattage which increased overall savings.

CIP_600	186,976	164,565	88%	During the desk review, the evaluator updated the baseline fixtures codes based on supplied documentation. The difference in realization rate is due to differences in baseline fixture wattages.
CIP_627	101,085	84,903	84%	The ex post analysis verified different facility types for areas in the facility. The ex ante estimate was based on all office facility type where ex post analysis used retail facility type.
CIP_702	49,264	232,060	471%	During the desk review, the evaluators were unable to identify the cause of the discrepancy in realization rate. The evaluators believe there was a mistake on the ex ante estimate based on the project documentation.
CIP_706	38,416	34,417	90%	During the desk review, the evaluators verified higher efficient wattages for the installed fixtures that caused a decrease in savings.
CIP_711	346,907	256,116	74%	The ex ante savings estimate for this project were based on an HOU of 8760. The ex post savings were determined using the TRM deemed HOU for a manufacturing facility.
CIP_755	15,961	20,529	129%	The discrepancy in realization rate is due to a difference in analysis methodologies. Ex post used TRM deemed savings with site specific information and ex ante is based on an average of deemed savings values.
CIP_777	94,732	71,686	76%	The discrepancy in realization rate is due to the evaluators calculating a different CDD and HDD value than what was used in the ex ante estimate.
CIP_778	55,487	36,405	66%	The discrepancy in realization rate is due to the evaluators calculating a different CDD and HDD value than what was used in the ex ante estimate.
CIP_790	520,140	317,295	61%	The discrepancy in realization rate is due to the evaluators verifying different post fixture wattages and fixture counts. Additionally, the ex ante estimates in the project documentation do not match the ex ante kWh in the tracking data.
CIP_813	178,861	915,081	512%	The discrepancy in realization rate is due to the evaluators verifying different post fixture wattages and fixture counts. The ex ante estimate also had different baseline fixture wattages than what the evaluator used in the ex post analysis.
CIP_882	1,107,618	443,047	40%	This project is a BMS project that was initially claimed at the full project savings. This project is now split across PY13 and PY14 where 40% of the ex ante savings will be claimed this year and the remaining 60% will be evaluated in PY14.

18.4.1.4 Avoided Replacement Costs

The Evaluators have added the benefits of avoided replacement costs (ARC). The table below summarize the ARC by measure in Large C&I Solutions.

Information on methodology can be found in Section 3.4.1.3 Avoided Replacement Costs.

TABLE 18-16 SUMMARY OF ARC FOR LARGE C&I SOLUTIONS

Measure	*Ex Post* Gross ARCs ($)	*Ex Post* Net ARCs ($)	NPV ARCs ($)
HVAC	$0	$0	$0
BMS	$0	$0	$0
Chiller	$0	$0	$0
Linear LED	$224,543	$215,561	$215,561
LED Fixtures	$160,854	$154,420	$154,420
Incentive Bonus	$0	$0	$0
Screw Based LED	$4,182	$4,014	$4,014
Air Compressor	$0	$0	$0
VFD	$0	$0	$0
Lighting Controls	$0	$0	$0
LED Exit Sign	$0	$0	$0
Kitchen Exhaust Controls	$0	$0	$0
Coil Cleaning	$0	$0	$0
Exterior LED	$4,879	$4,684	$4,684
Door Gaskets	$0	$0	$0
Total	**$394,458**	**$378,680**	**$378,680**

Sums may differ due to rounding.

18.4.2 NET IMPACT FINDINGS

Participant survey responses were used to estimate the net energy impacts for the Small C&I, Large C&I, PFI, Construction Solutions offerings combined. The methodology used is described in 3.2.2.

18.4.2.1 Net Savings Results

Net savings by measure can be found in Figure 18-1.

18.4.3 PROCESS FINDINGS

The Evaluators conducted staff interviews as well as administered large commercial and industrial participant survey, and trade ally interviews.

18.4.3.1 Staff and Implementer Interviews

The following section summarizes the key findings from in-depth interviews with two ENO program staff, and two APTIM staff; ENO staff participated in one interview and APTIM staff participated in a second interview. These in-depth interviews aimed to learn more about Large C&I program design and operations, and the successes and challenges experienced during PY13. Interviews lasted approximately 60 minutes and were conducted using the Microsoft Teams platform. The evaluators recorded all interviews with participant permission. The following narrative summarizes these interviews.

18.4.3.1.1 *Program Description and Implementation*

Staff noted that PY13 witnessed a rebound in the Large C&I program interest following the initial downturn that resulted from COVID-19. However, despite some increased interest, the program continues to struggle. In an attempt to boost participation and meet goals earlier in the year, staff restructured the completion bonus

system to incentivize earlier project completion, namely a 25% bonus for projects completed by September 30th. Despite this incentive, staff noted that the program was not on track to complete its goal. Staff attribute part of the slow program performance to the new program contract and the fact that recruitment could not start at the end of PY13, as done in previous years, but rather had to wait for the official new contract data on January 1, 2023. They explained that this delay slowed down the project pipeline, which most impacted large commercial programs.

18.4.3.1.2 *Program Changes*

Programmatic changes include new compressed air leak repair measures. Moving forward, staff are exploring changes and measure additions that will compensate for previous lighting-related savings that are now ineligible.

18.4.3.1.3 *Trade Allies*

Entergy New Orleans has a commercial trade ally network of about 75-90 trade allies. Of these trade allies, there are about thirteen highly active market actors. In general, trade allies generate their own leads and are responsible for much of the program marketing. Program staff assign project leads that come through Entergy either via call center or direct install program, based on trade ally capacity and previous performance.

18.4.3.2 Participant Survey

The Evaluators conducted a mixed-mode survey with customers who participated in Small C&I Solutions, Large C&I Solutions, Publicly Funded Institutions, and CI Construction Solutions to gain insight into customer satisfaction and feedback. All customers with valid email addresses included in the program's tracking data were emailed an invitation to take the survey (n=57). Five participants responded to survey attempts. Due to the low sample size, responses were analyzed together for all four programs (Small C&I Solutions, Large C&I Solutions, Publicly Funded Institutions, and CI Construction Solutions). Full survey summary can be found in the Small C&I Solutions chapter, section 17.4.3.2.

18.4.3.3 Near Participant Trade Ally Interviews

Evaluators conducted interviews about participation in the Energy Smart Large Commercial & Industrial Solutions program with near-participant trade allies to gather feedback about trade ally awareness and general knowledge of energy efficiency actions and Energy Smart's programs, as well as barriers to program engagement. "Near-participant" trade allies are trade allies who have previously participated in the Energy Smart program or have expressed interest in program engagement, but not yet enrolled. Energy Smart tracking data for the Large Commercial & Industrial Solutions savings program included 70 unique trade ally contacts in the program. Of these contacts, 51 had valid contact information. Trade allies were contacted via phone and email three times and invited to complete an interview. Eight near-participants responded to an interview for a response rate of 16%.

18.4.3.3.1 *Program Strengths*

All eight trade allies shared that the biggest benefit to participating in the Energy Smart program is the incentives and rebates that help their customers save money and encourage the shift towards increased energy efficiency. The allies consider the program to be an avenue for business growth. Half of the trade allies

interviewed, four out of eight, see the potential for business expansion as they gain credibility and trust through participation in the program and when leveraging the strength and credibility of Entergy New Orleans.

> *"It's a huge benefit to service providers to say that these are the recommendations we're making and your utility is on board with these recommendations... The utility here in Louisiana trusts that what we're doing is providing sound engineering. So being able to co-brand in those respects is helpful… I think that's really powerful to me." – Engineering Firm, Compressed Air Industrial Systems*

When available and used, trade allies find program support and training highly valuable and appreciate the program representative's assistance and guidance, a sentiment shared by four of the eight trade allies.

> *"I really like the way they support us, the way they get the training. I really like that they are very helpful. The communication is amazing, honestly, because it's not about only offered incentives and apply and get it's about how they will handle the communication, explanation, training. So besides the financial benefit and the credibility we gain is definitely the help, the support that we receive to a lot of questions and we receive the support from them. It's absolutely really important to be able to explain to the client the accurate information." – Consultant, Lighting Systems*

18.4.3.3.2 *Program Challenges*

The administrative processes of the programs can sometimes be a challenge with all trade allies expressing some level of concern about the rigorous requirements and procedures. Three of the eight trade allies pointed out a lack of clear communication from the program at times, which can lead to confusion and inefficiency.

> *"I'm a big believer in communication, and I think that's one of the things that hinder it for me. I've spent two and a half hours on the phone [and] gotten nowhere." – Consultant, Lighting and Control Systems*

Detailed documentation requirements in the application process and extensive paperwork have limited some companies' interaction with the program, especially for small companies that may lack the infrastructure to support participation, as stated by three out of eight trade allies.

> *"The paperwork is just a pain. It's absolutely ridiculous amount of paperwork that's involved and it was only in the city of New Orleans. That in itself is like the biggest turnoff in the world of trying to do anything in the city of New Orleans. It's a legitimate nightmare." – Installer, Process Automation, Controls, and Instrumentation*

> *Everybody should be able to manipulate and know what to do on those calculators. If there's things that we don't know that other people do, shame on Entergy, because we're all supposed to be working together here." – Consultant, Lighting and Control Systems*

Six out of eight trade allies shared that the program's incentives are not always as beneficial as expected, and the payment process after a project is completed can put a financial strain on small businesses.

> *"The fact that we have to sign a contract where the money we has to be paid, but the incentive is paid to the customer after the job is finished, sometimes that puts the customer in a bit of a budget situation." – Consultant, Energy Modeling, and Energy Audits*

Half of the trade allies interviewed felt that Market saturation for projects in New Orleans is a significant challenge, with many trade allies finding that potential clients having already completed the energy saving projects.

> *"The market is too saturated with LED lighting companies. The market is too saturated with some of the technology in the New Orleans area. So every ten clients we approach, eight already have LED and the other two, they don't want to talk, or another ten companies already approached them." – Consultant, Lighting Systems*

The ranking system on the Energy Smart program's website does not always accurately represent the caliber of the companies listed and does not create an even playing field for all companies, as stated by three of the eight allies interviewed.

> *"A lot of people go to the website and go to find a trade ally, they see the first two or three, and they don't look in for us. Whoever goes to the website and [does] their homework before approaching is at least 50% is sold already just because that name is there. So in my opinion [rankings] should be categorized [by program or specialty]." – Consultant, Lighting, Energy Audits, and Building Control Systems*

18.4.3.3.3 *Deeper Trade Ally Engagement*

Trade allies call out several ways that could increase participation in the Large Commercial & Industrial Energy Savings program. Top suggestions from the eight allies interviewed include providing marketing support and tools that can help them sell the program to their customers, ensuring effective communication and collaboration between trade allies and energy program representatives, and supporting trade allies on sales calls when necessary.

> *"Finding more effective ways to communicate… making sure that the material is simple. There's an offering information material, [it's] a leaflet that they sent out on the email. It's a PDF leaflet and just basically talks about the commercial industrial offering. That's simple. We can read that. We don't have to hear a whole lot of jargon. It's simple. Go over this brochure, get busy. That's it. So just keeping it simple, straight to the point, and when necessary, be technical." – Installer, Lighting & Control Systems*

> *"We needed to be able to make sure that our language and our pitch was lining up with the information. And because we didn't come up with the actual content [of the brochures], we would need to work with the salesperson to make sure that our sales pitch will be effective and or have the actual salesperson or the representative come with us." – Installer, Lighting & Control Systems*

Helping trade allies navigate a saturated market with limited available projects would encourage more trade allies to participate, as would expanding Energy Savings programs to recognize and incentivize other energy-saving solutions, such as cool roof coating. All trade allies would appreciate incentives that are larger or provided in a manner that helps offset upfront investments from trade allies or their customers would also help with engagement. All trade allies interviewed would appreciate improvements in the application process and paperwork that reduce the impact and time required for trade allies to complete the programs would encourage more repeat participation.

18.5 Data Tracking Review

The Evaluators reviewed the tracking data provided and found the following issues. The following parameters were missing or incomplete for the program.

- Measure Specific Information: The tracking data lacked pre and post measure information such as fixture codes, fixture wattages, equipment size, and equipment efficiency.

The Evaluators note that a supplemental tracking dataset was provided for this program and a few others. This data had some additional fields.

18.6 Findings and Recommendations

The following summarizes the key findings and conclusions from the evaluation.

- Incentives and Rebates Encourage Energy Efficiency: All trade allies interviewed unanimously agreed that program incentives and rebates play a crucial role in helping customers save money while promoting increased energy efficiency. These financial incentives serve as powerful motivators for customers to adopt energy-saving measures and technologies, ultimately driving positive environmental and economic outcomes.
- Program as a Catalyst for Business Growth: Trade allies highlighted the program as a potential catalyst for business growth. Specifically, four out of the eight interviewed trade allies identified the program as a valuable avenue for expanding their businesses. They emphasized that participation in the program enhances their credibility and trustworthiness in the eyes of customers, thus opening up opportunities for business expansion. Leveraging the reputation and credibility of the program further strengthens their position in the market, facilitating growth and market penetration.
- Administrative Processes as Barriers to Participation: Despite recognizing the benefits of the program, trade allies identified administrative processes, requirements, and procedures as significant barriers to participation. Specifically, they cited detailed documentation requirements during the application process and the burden of extensive paperwork as impediments to interaction with the program. This issue is particularly pronounced for small companies that may lack the necessary infrastructure to support their participation, underscoring the need for streamlining administrative procedures to improve accessibility and participation rates.
- Concerns about Market Saturation: Responding trade allies expressed concerns about market saturation, particularly in the New Orleans area. Half of the interviewed trade allies perceived market saturation as a significant challenge, noting that many potential clients have already completed energy-

saving projects. This saturation poses a challenge for trade allies seeking new business opportunities and underscores the importance of exploring innovative strategies to reach untapped markets or differentiate services in a competitive landscape.

The following summarizes key recommendations after completing the PY13 evaluation.

- Reevaluate Program Incentives: Feedback from six out of eight trade allies highlighted concerns regarding the adequacy of program incentives. They noted that the current incentives may not always meet expectations, and the payment process following project completion can strain the finances of small businesses. To address this, the program should consider reassessing and potentially recalibrating its incentive structure to ensure that it provides tangible benefits that adequately reward trade allies for their participation. Moreover, in light of market saturation, there's an opportunity to explore expanding program offerings to incentivize greater engagement and participation among trade allies.
- Reassess Trade Ally Ranking System: Some interviewed trade allies raised issues regarding the effectiveness and fairness of the current trade ally ranking system on the program's website. They pointed out that the existing system may not accurately reflect the quality and capabilities of listed companies, creating disparities and challenges for all participants. Therefore, it's advisable for the program to conduct a comprehensive reassessment of the ranking system to ensure transparency, fairness, and alignment with the actual performance and expertise of trade allies.
- Simplify Application Process and Minimize Paperwork: All trade allies unanimously expressed the need for improvements in the application process and paperwork requirements. Streamlining these processes and reducing paperwork burdens would not only alleviate the administrative burden on trade allies but also enhance efficiency and encourage greater participation and repeat engagement. By simplifying procedures and minimizing paperwork, Entergy can create a more user-friendly and accessible experience for trade allies, fostering a conducive environment for program involvement and collaboration.
- Enhance Marketing Support to Trade Allies: To bolster the effectiveness of marketing efforts, it's essential for the program to provide enhanced support and resources to trade allies. This includes furnishing materials that enhance credibility for trade allies and effectively communicate the benefits and offerings of the program to end customers. Moreover, facilitating co-branding opportunities between trade allies and the program can strengthen partnerships and build trust among customers. Additionally, making clear, concise, and easy-to-understand marketing materials readily available to trade allies will empower them to effectively convey program details and benefits to their customers, ultimately driving greater awareness and participation

19 C&I CONSTRUCTION SOLUTIONS

The tables below report ex ante gross, ex post gross, ex post net energy savings (kWh) (both annual and lifetime), demand reductions (kW), participation, and incentive spend, by measure, where applicable. Additionally, the tables above represent evaluation findings for each measure, whereas the analysis described in this chapter summarizes the findings of the evaluation.

TABLE 19-1 PY13 C&I CONSTRUCTION SOLUTIONS ENERGY SAVINGS (KWH)

Measure	*Ex Ante* Gross Savings (kWh)	Realization Rate (kWh)	*Ex Post* Gross Savings (kWh)	NTG	*Ex Post* Net Savings (kWh)
Interior Lighting	141,618	73%	103,940	54%	56,128
Exterior Lighting	36,976	98%	36,364	54%	19,637
HVAC	46,416	94%	43,584	54%	23,535
Kitchen Exhaust Controls	14,535	100%	14,699	54%	7,938
ENERGY STAR Refrigerator	3,122	101%	2,394	54%	1,293
ENERGY STAR Freezer	2,177	77%	2,201	54%	1,189
ENERGY STAR Dishwasher	22,867	101%	18,154	54%	9,803
Convection Oven	1,988	79%	1,362	54%	735
VFD	34,119	69%	34,097	54%	18,412
Insulation	39,329	100%	5,040	54%	2,722
Cool Roof	235	13%	30	54%	16
Total	**343,381**	**76%**	**261,865**	**54%**	**141,407**

TABLE 19-2 PY13 C&I CONSTRUCTION SOLUTIONS DEMAND SAVINGS (KW)

Measure	*Ex Ante* Gross Demand (kW)	Realization Rate (kW)	*Ex Post* Gross Demand (kW)	NTG	*Ex Post* Net Demand (kW)
Interior Lighting	31.02	97%	30.05	54%	16.23
Exterior Lighting	0.00	100%	0.00	100%	0.00
HVAC	17.11	121%	20.67	54%	11.16
Kitchen Exhaust Controls	0.00	100%	0.00	100%	0.00
ENERGY STAR Refrigerator	1.90	128%	2.44	54%	1.32
ENERGY STAR Freezer	0.35	96%	0.34	54%	0.18
ENERGY STAR Dishwasher	0.25	128%	0.32	54%	0.17
Convection Oven	2.92	99%	2.90	54%	1.56
VFD	0.38	85%	0.32	54%	0.17
Insulation	0.00	100%	0.00	100%	0.00
Cool Roof	3.45	23%	0.78	54%	0.42
Total	**57.37**	**101%**	**57.82**	**54%**	**31.23**

TABLE 19- C&I CONSTRUCTION SOLUTIONS LIFETIME SAVINGS SUMMARY

Measure	EUL	*Ex Post* Gross Lifetime Energy Savings (kWh)	*Ex Post* Net Lifetime Energy Savings (kWh)
New Construction Interior Lighting	15	1,559,100	841,914
New Construction Exterior Lighting	15	545,460	294,549
HVAC	15	653,757	353,029
Incentive Bonus	1	-	-
Kitchen Exhaust Controls	15	220,487	119,063
Energy Star Refrigerator	12	28,725	15,512
Energy Star Freezer	12	26,413	14,263
Energy Star Dishwasher	11	199,699	107,838
Convection Oven	12	16,343	8,825
VFD	15	511,451	276,184
Insulation	20	100,798	54,431
Cool Roof	15	451	244
Total	**13**	**3,862,686**	**2,085,851**

TABLE 19-3 C&I CONSTRUCTION SOLUTIONS INCENTIVE SPEND SUMMARY

Measure	Participation (Count of Measures)	Incentive Spend ($)
New Construction Interior Lighting	4	$10,856
New Construction Exterior Lighting	2	$2,568
HVAC	82	$3,698
Incentive Bonus	4	$5,443
Kitchen Exhaust Controls	3	$1,164
Energy Star Refrigerator	4	$248
Energy Star Freezer	1	$165
Energy Star Dishwasher	3	$1,662
Convection Oven	1	$159
VFD	8	$2,730
Insulation	1	$3,146
Cool Roof	1	$19
Total	**114**	**31,856**

19.1 Program Description

The Commercial & Industrial Construction Solutions (C&I NC) program intends to encourage customers to design and construct higher efficiency facilities than required by building codes or planned designs. This offering is available to ground-up construction, additions, or expansions, building repurposing and commercial building restorations. Incentives are available for the following:

- Predefined prescriptive savings based on units installed
- Lighting wattage below approved baseline
- Custom qualifying measures
- Whole Building

19.1.1 PROGRAM DELIVERY CHANNELS AND EXPECTED SAVINGS

The evaluation approach for PY13 included the following activities, database review, desk reviews, site visits, participants surveys and staff interviews. A total of fiveprojects were completed in the C&I NC program in PY13. Below

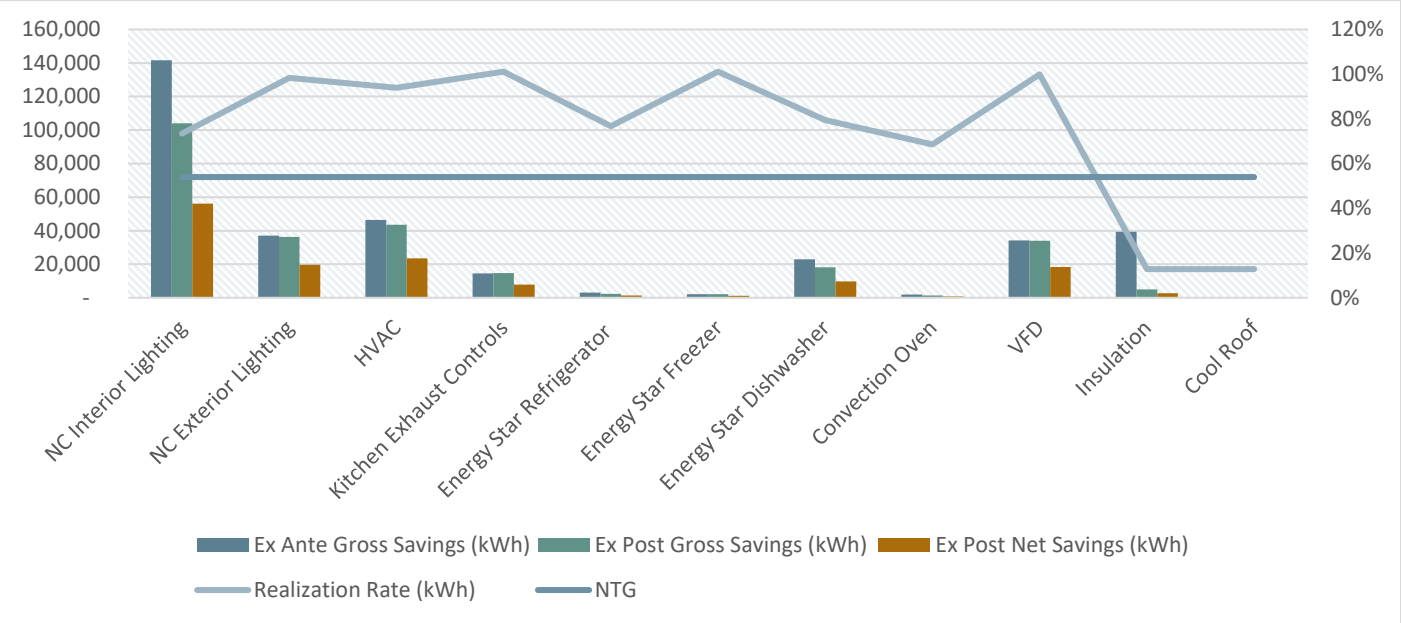


Figure 19-1 shows end use contribution as part of the overall expected savings.

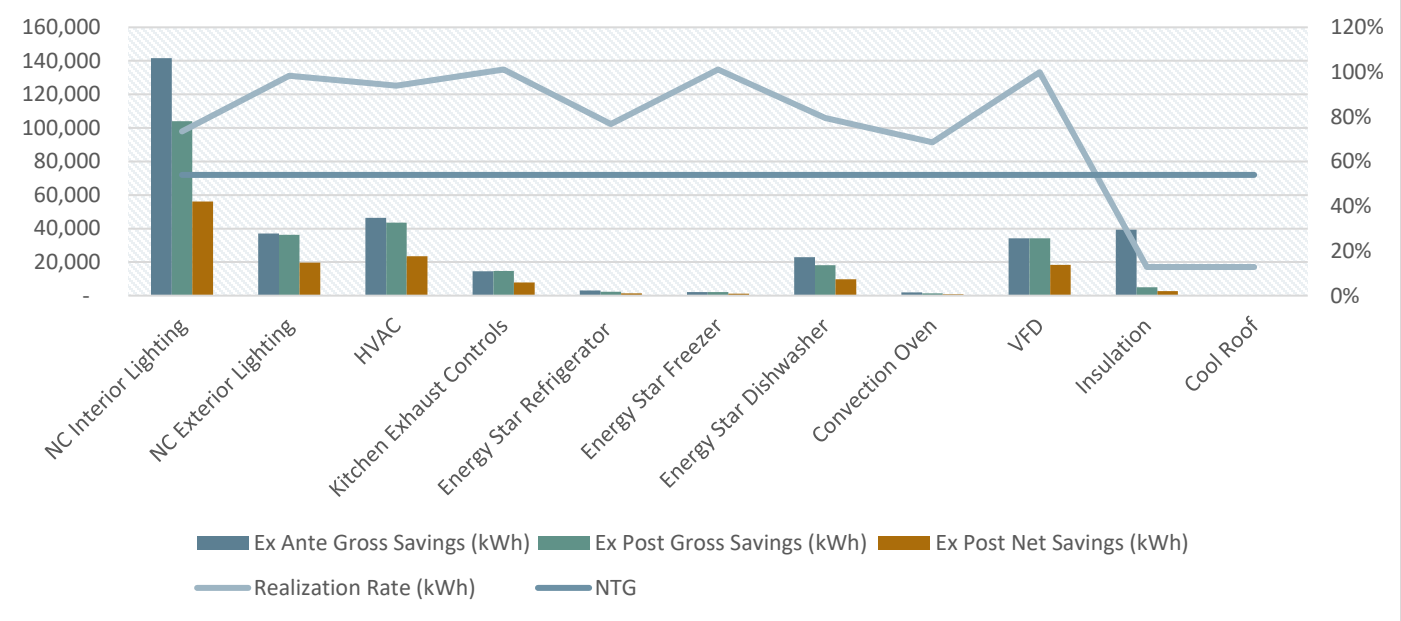


FIGURE 19-1 C&I NC SAVINGS BY PROJECT TYPE

19.1.2TIMING OF PROJECTS

According to the tracking data, in PY13, the five projects completed in the program had start months in February, July, august and December of 2023.

19.1.3TRADE ALLIES

In PY13, the program saw projects completed by five trade allies. The program participation is shown below.

TABLE 19-4 C&I NC TRADE ALLY PARTICIPATION

Trade Ally	Ex Ante kWh	Project Count	Ex Ante kWh %
Trade Ally 1	192,563	1	56%
Trade Ally 2	39,486	1	11%
Trade Ally 3	13,370	1	4%
Trade Ally 4	42,256	1	12%
Trade Ally 5	55,707	1	16%

19.1.4GOAL ACHIEVEMENT

In PY13, the program had a verified savings of 261,865 kWh and a verified peak demand reduction of 38.00 kW.

TABLE 19-5 C&I NC SUMMARY OF GOAL ACHIEVEMENT

Ex Post Gross Energy Savings (kWh) Goal	% to kWh Goal	*Ex Post* Gross Energy Savings (kWh)
3,512,971	7%	261,865

19.2 Evaluation Methodology

Evaluation of the program involved the following:

- Stratified Random Sampling (as detailed in section (as detailed in Section 3.3.1) and by selecting large saving sites with certainty.
- On-site verification for two projects, desk reviews of all four sampled projects; and
- Interviewing of program participants and trade allies.

19.2.1SITE VISITS

The on-site inspections were used to verify installations and to determine any changes to the operating parameters since the measures were first installed. Energy savings was estimated using proven techniques, including engineering calculations using industry standards to determine energy savings.

19.2.2SAMPLE DESIGN

Sampling was developed using the Stratified Random Sampling procedure detailed in Section 3.3. This procedure provides 90% confidence and +/- 10% precision with a significantly reduced sample than simple random sampling would require by selecting the highest saving facilities with certainty, thereby minimizing the variance that non-sampled sites can contribute to the overall results.

In PY13, there were five total projects completed in the Construction Solutions Program. These projects were split into two strata, one certainty stratum for the largest project and one stratum for the remaining projects. In PY13, the achieved sampling precision was ±9.8% at 90% confidence. The below table summarizes the strata boundaries and sample frames for the program and summarizes expected savings of both the sample and population.

TABLE 19-6 C&I NC SAMPLE DESIGN

	Stratum 1	Stratum 2	Totals
Strata boundaries (kWh)	< 150,000	>150,000	**NA**
Number of projects	4	1	**5**
Total kWh savings	150,818	192,563	**343,381**
Average	37,704	192,563	**68,676**
Standard deviation	17,703	-	**70,932**
Coefficient of variation	0.47	-	**1.03**
Final design sample	**3**	**1**	**4**

TABLE 19-7 C&I NC SAMPLED RESULTS

Strata	Sample Expected Savings	Total Expected Savings	% Savings in M&V Sample
Stratum 1	95,111	192,563	49%
Stratum 2	192,563	192,563	100%
Totals	**287,674**	**343,381**	**36%**

19.2.3GROSS IMPACT FINDINGS

The Evaluators reviewed all project documentation, including invoices, spec sheets and site photos to verify the installation of the equipment. Energy and demand reduction calculations were reviewed to verify that they were consistent with the TRM and that all inputs were appropriate. Changes and corrections between Ex Ante and Ex Post savings estimates were documented and realization rates based on verified savings were developed for each site. The realization rates for sites within each stratum were then applied to the non-sampled sites within their respective stratum. In PY13, there were a total of five projects completed in the program. Of these five projects, four were sampled.

TABLE 19-8: C&I NC SAMPLE RESULTS

Project ID(s)	Facility Type	*Ex Ante* Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate	Reason for variation
CIP_471	Retail: Excluding Malls & Strip Centers	39,486	27,057	69%	New Construction lighting methodology for the *ex ante* analysis does not follow the TRM methodology. Ex post used actual site information for facility type and equipment specs that were confirmed during a site visit.
CIP_703	Health Care: Out-patient	13,370	9,861	74%	New Construction lighting methodology for the *ex ante* analysis does not follow the TRM methodology. Ex post used actual site information for facility type and equipment specs.
CIP_734	Manufacturing – 1 and 2 Shift	42,256	5,415	13%	*Ex ante* calculation used a baseline R value of 1 for wall and roof insulation rather than the code required minimum R value.

19.2.3.1 Avoided Replacement Costs

The Evaluators have added the benefits of avoided replacement costs (ARC). The table below summarizes the ARC by measure.

Information on methodology can be found in Section 3.4.1.3.

TABLE 19-9 C&I NC ARC SUMMARY

Measure	*Ex Post* Gross ARCs ($)	*Ex Post* Net ARCs ($)	NPV ARCs ($)
New Construction Interior Lighting	$13	$7	$7
New Construction Exterior Lighting	$287	$155	$155
HVAC	$0	$0	$0
Incentive Bonus	$0	$0	$0
Kitchen Exhaust Controls	$0	$0	$0
Energy Star Refrigerator	$0	$0	$0
Energy Star Freezer	$0	$0	$0
Energy Star Dishwasher	$0	$0	$0
Convection Oven	$0	$0	$0

VFD	$0	$0	$0
Insulation	$0	$0	$0
Cool Roof	$0	$0	$0
Total	**$300**	**$162**	**$162**

19.2.4 NET IMPACT FINDINGS

Participant survey responses were used to estimate the net energy impacts for the Small C&I, Large C&I, PFI, Construction Solutions offerings combined. The methodology used is described in 3.2.2.

19.2.5 PROCESS EVALUATION FINDINGS

The findings from the process evaluation are found in the subsections below.

19.2.5.1 Staff and Implementer Interviews

The following section summarizes the key findings from in-depth interviews with two ENO program staff, and two APTIM staff; ENO staff participated in one interview and APTIM staff participated in a second interview. These in-depth interviews aimed to learn more about Small Commercial Solutions program design and operations, and the successes and challenges experienced during PY13. Interviews lasted approximately 60 minutes and were conducted using the Microsoft Teams platform. The evaluators recorded all interviews with participant permission. The following narrative summarizes these interviews.

19.2.5.1.1 *Program Description and Implementation*

The Commercial & Industrial Construction Solutions (C&I NC) program intends to encourage customers to design and construct higher efficiency facilities than required by building codes or planned designs. This offering is available to ground-up construction, additions, or expansions, building repurposing and commercial building restorations.

The New Construction program continues to struggle. Programmatic challenges include long lead times and difficulties connecting with construction companies and developers. Most notably, staff indicated they struggle with the strict preapproval timeline which makes it difficult to build a customer pipeline.

Staff are working on increasing direct outreach and finding construction firms and developers that might be most interested in the program.

19.2.5.2 Participant Survey

The Evaluators conducted a mixed-mode survey with customers who participated in Small C&I Solutions, Large C&I Solutions, Publicly Funded Institutions, and CI Construction Solutions to gain insight into customer satisfaction and feedback. All customers with valid email addresses included in the program's tracking data were emailed an invitation to take the survey (n=57). Five participants responded to survey attempts. Due to the low sample size, responses were analyzed together for all four programs (Small C&I Solutions, Large C&I Solutions, Publicly Funded Institutions, and CI Construction Solutions). Full survey summary can be found in the Small C&I Solutions chapter, section 17.4.3.2.

19.2.5.3 Near Participant Trade Ally Interviews

Evaluators conducted interviews about participation in the Energy Smart Commercial & Industrial Construction savings program with near-participant trade allies to gather feedback about trade ally awareness and general knowledge of energy efficiency actions and Energy Smart's programs, as well as barriers to program engagement. "Near-participant" trade allies are trade allies who have previously participated in the Energy Smart program or have expressed interest in program engagement, but not yet enrolled. Energy Smart tracking data for the Commercial & Industrial Construction savings program included 38 unique trade ally contacts in the program. Of these contacts, 20 had valid contact information. Trade allies were contacted via phone and email three times and invited to complete an interview. Two near-participants responded to an interview for a response rate of 10%.

19.2.5.3.1 *Program Strengths*

Trade allies interviewed are both with larger organizations and consider the program's application process reasonably straightforward. Their organizations have a dedicated person or department that works exclusively with rebate programs, a sentiment expressed by one ally from a larger organization. These allies also feel confident using the program's calculator. They appreciate working with third-party entities that help with applications and paperwork.

19.2.5.3.2 *Program Challenges*

When asked about participation in the program, both trade allies express that many local organizations are not actively working on Commercial & Industrial Construction projects due to a lack of business and opportunity in New Orleans.

> *"Honestly, the only reason is because we haven't had a customer in the location. So we're mostly working with large commercial or large industrial facilities, let's say a plastics manufacturer, glass manufacturer, [that] has multiple ten locations across the US. We just haven't run into a lot that also have a location in Louisiana." – Engineering Firm, Compressed Air Systems*

DLC requirements can pose challenges for companies that work in lighting, especially when it comes to custom solutions for their customers. The rigidity and specific requirements of DLC can make it difficult for such companies to meet their specifications. At times products are delisted from DLC or Energy Star ratings during a project, which can affect rebate payments and pose challenges for service providers at the end (two out of two trade allies shared challenges in working with DLC requirements).

> *"Well, the product requirements, they're all based on DLC rating and Energy Star [and] those could be updated every year or every two years. Once they update it, [if] the utility sees the product is delisted from DLC, they're probably not going to pay. This could be tough because there's a time period when we ordered the material already and we install it, but during the installation time, DLC took it off the list for whatever reason. Then we're missing out on money." – Distributor, Lighting Controls*

Both trade allies feel that there is not always equal treatment when it comes to new program opportunities, exposing an opportunity to develop better relationships with trade allies to understand and prioritize a

provider's expertise rather than simply assigning equal opportunities to all service providers. Trade allies with a larger national footprint, as both trade allies in this interview set were, work with third-party contractors to complete program work. These allies sometimes face issues with contractors not adhering to program instructions or requirements, which can create difficulties in project execution or program completion, which was expressed by both allies.

> *"There are certain times where we hire a contractor and the contractor just doesn't listen to us. It could be troublesome. Sometimes the contractor wants to break the law or something, or we ask them to take pictures and they don't take good pictures." – Distributor, Lighting Controls*

19.2.5.3.3 *Deeper Trade Ally Engagement*

Helping trade allies to leverage the most from the program is very appealing. One trade ally with an extensive national footprint suggested multiple ways to encourage deeper engagement:

First, a system to help offset upfront costs for service providers would be helpful for smaller firms and larger projects.

> *"When the payment points for surveys and studies have some level of metric that varies on performance. I like programs that have a scalar for productive output. If you are doing larger projects, there's a way for you to make a little bit more money for you and the customer for producing those projects." – Engineering Firm, Compressed Air Systems*

> *"The Entergy Arkansas program is actually really neat because they encourage you to do other measures with their incremental program scale. So you do one project, they'll pay you [one rate] but if they do two or three projects in different industrial oil, they'll pay a higher rate on all the projects. It's kind of gamifying the approach, but it gets customers motivated to do projects. They might not be interested in that smaller project, but they're a lot interested if it helps their large project that they've kind of already got in the works." – Engineering Firm, Compressed Air Systems*

Next, creating co-branding opportunities would allow trade allies to build business and win new projects by leveraging the strength of their partner utilities.

> *"Some focus on co-branding, that's happening in some programs, [but] not in a lot of them as it's a huge benefit to service providers to say that, 'okay, these are the recommendations we're making and your utility is on board with these recommendations. We've been vetted we know or the utility here trusts that what we're doing is providing sound engineering.' And this investigative report has a stamp of approval from them." – Engineering Firm, Compressed Air Systems*

Finally, offering a portal or account manager for trade allies makes programs easier to leverage. Rigorous administrative processes help prevent issues with follow-ups or delays in payments. Programs that have clear procedures and access to direct information on project status are helpful for trade allies.

> *"One thing that's very helpful is when there's some sort of portal or account manager associated with service providers so I can see and get direct information on a project status. Not every program has that, which sounds kind of crazy. It's really helpful as a service provider to be able to find that information online and then figure out how to navigate the landscape from there." – Engineering Firm, Compressed Air Systems*

19.3 Data Tracking Review

The Evaluators reviewed the tracking data provided and found the following issues. The following parameters were missing or incomplete for the program.

- Measure Specific Information: The tracking data lacked pre and post measure information such as fixture codes, fixture wattages, equipment size, and equipment efficiency.

The Evaluators note that a supplemental tracking dataset was provided for this program and a few others. This data had some additional fields.

19.4 Findings and Recommendations

The following summarizes the key findings and conclusions from the PY13 evaluation.

- Addressing Lack of Potential Customers: Trade allies expressed a keen interest in participating in the program; however, they identified a significant barrier stemming from the limited availability of potential customers in the New Orleans area. The shortage of construction-related business opportunities poses a challenge for trade allies seeking to engage with the program effectively. To overcome this barrier, the program should explore strategies to stimulate demand and create a conducive environment for energy efficiency projects. This may involve targeted marketing campaigns, outreach initiatives, and partnerships with local businesses and community organizations to raise awareness about the program's benefits and incentivize participation.
- Navigating DLC Requirements: Interviewed trade allies highlighted challenges associated with meeting the stringent requirements set forth by the DLC. The rigidity and specificity of DLC criteria can pose difficulties for lighting-related companies in adhering to their specifications. Moreover, the dynamic nature of product listings and potential delisting from DLC or ENERGY STAR ratings during the course of a project further complicates matters, potentially impacting rebate payments and creating operational hurdles for service providers. To address this challenge, Entergy should work closely with trade allies to provide comprehensive guidance and support in navigating DLC requirements. This may involve offering training sessions, resources, and technical assistance to ensure compliance with standards and streamline the certification process. Additionally, establishing clear communication channels with DLC and other relevant regulatory bodies can facilitate timely updates and mitigate potential disruptions caused by product delisting or rating changes.

The following summarizes key recommendations after completing the PY13 evaluation.

- Reevaluating Program Incentives: It is advisable to reassess the current structure of program incentives, especially considering the financial constraints faced by service providers, particularly smaller firms, and

the financial burden associated with larger projects. Implementing a system to help offset upfront costs for service providers could significantly alleviate financial barriers and encourage broader participation in the program. This might involve offering upfront grants, low-interest loans, or other financial incentives tailored to the needs of different types of service providers. By providing financial support, the program can foster greater engagement from a diverse range of service providers and facilitate the implementation of energy efficiency projects across various scales.

- Enhancing Marketing Support to Trade Allies: To bolster the effectiveness of marketing efforts and enhance the credibility of trade allies, it is essential to provide comprehensive marketing support and resources. This includes developing materials that not only highlight the benefits of the program but also showcase the expertise and credibility of participating trade allies. By allowing and supporting co-branding initiatives between trade allies and the program, the program can leverage the reputation and trust established by trade allies within their respective communities. Clear and easy-to-understand marketing materials should be made readily available to trade allies, empowering them to effectively communicate the value proposition of the program to their customers. Additionally, providing training and guidance on marketing strategies can further equip trade allies with the necessary tools to promote the program and drive customer engagement effectively.

20 PUBLICLY FUNDED INSTITUTIONS

20.1 Summary

The tables below report *ex ante* gross, *ex post* gross, *ex post* net energy savings (kWh) (both annual and lifetime), demand reductions (kW), participation, and incentive spend, by measure, where applicable. Additionally, the tables above represent evaluation findings for each measure, whereas the analysis described in this chapter summarize the findings of the evaluation stratum.

TABLE 20-1 PY13 PFI ENERGY SAVINGS (KWH)

Measure	*Ex Ante* Gross Savings (kWh)	Realization Rate (kWh)	*Ex Post* Gross Savings (kWh)	NTG	*Ex Post* Net Savings (kWh)
Screw Based LED	236,806	117%	278,175	91%	253,139
Linear LED	1,459,343	112%	1,627,262	91%	1,480,808
LED Fixtures	151,390	104%	157,229	91%	143,078
Incentive Bonus	-	#DIV/0!	-	91%	-
New Construction Exterior Lighting	135	108%	146	91%	132
BMS	1,334,184	62%	820,552	91%	746,703
Chiller	51,740	100%	51,914	91%	47,242
Total	**3,233,597**	**91%**	**2,935,278**	**91%**	**2,671,103**

Sums may differ due to rounding.

TABLE 20-2 PY13 PFI DEMAND REDUCTIONS (KW)

Measure	*Ex Ante* Gross Demand (kW)	Realization Rate (kW)	*Ex Post* Gross Demand (kW)	NTG	*Ex Post* Net Demand (kW)
Screw Based LED	27.55	168%	46.32	91%	42.15
Linear LED	174.73	136%	238.46	91%	217.00
LED Fixtures	30.70	99%	30.45	91%	27.71
Incentive Bonus	-	100%	-	91%	-
New Construction Exterior Lighting	-	100%	-	91%	-
BMS	-	100%	-	91%	-
Chiller	20.54	99%	20.33	91%	18.50
Total	**253.52**	**132%**	**335.55**	**91%**	**305.35**

Sums may differ due to rounding.

TABLE 20-3 PY13 PFI LIFETIME SAVINGS SUMMARY

Measure	EUL	*Ex Post* Gross Lifetime Energy Savings (kWh)	*Ex Post* Net Lifetime Energy Savings (kWh)
Screw Based LED	1	278,175	253,139
Linear LED	15	24,408,924	22,212,121
LED Fixtures	15	2,358,429	2,146,171
Incentive Bonus	1	-	-
New Construction Exterior Lighting	15	2,183	1,987
BMS	15	12,308,287	11,200,541
Chiller	20	1,038,289	944,843
Total	**12**	**40,394,288**	**36,758,802**

Sums may differ due to rounding.

TABLE 20-4 PY13 PFI COUNT OF MEASURES AND INCENTIVE SPEND

Measure	Participation (Count of Measures)	Incentive Spend ($)
Screw Based LED	1,041	$6,341
Linear LED	23,329	$135,566
LED Fixtures	207	$9,134
Incentive Bonus	12	$48,121
New Construction Exterior Lighting	1	$564
BMS	8	$101,494
Chiller	130	$6,500
Total	**24,728**	**$307,720**

Sums may differ due to rounding.

20.2 Program Description

The Publicly Funded Institutions (PFI) program provides financial incentives and technical services to encourage the participation of publicly funded customers. The PFI offering is designed to help this customer segment overcome barriers to energy improvement, such as higher first-cost of efficiency equipment and a lack of technical knowledge or resources. The incentives are based on the total demand (kW) of the facility; above or below 100 kW. Rebates are available for the following categories: prescriptive (TRM-based); custom lighting; and custom non-lighting.

20.2.1 PROGRAM DELIVERY CHANNELS AND EXPECTED SAVINGS

The program was open and available to customers between January 1, 2023, and December 31, 2023. Project documentation showed that there were nineteen projects completed. These nineteen projects have a total expected energy savings of 3,233,597 kWh and a peak demand reduction of 253.52 kW.

TABLE 20-5 PFI SAVINGS EXPECTATIONS BY UTILITY

Project Count	Measure Count	*Ex Ante* Gross Energy Savings (kWh)	*Ex Ante* Gross Demand Reductions (kW)
19	24,728	3,233,597	253.52

TABLE 20-6 PFI SAVINGS EXPECTATIONS BY MEASURE TYPE

Program Component	Count of Project Components	*Ex Ante* Gross Energy Savings (kWh)	*Ex Ante* Gross Demand Reductions (kW)	Percent Savings (kWh)
Screw Based LED	1,041	236,806	27.55	7%
Linear LED	23,329	1,459,343	174.73	45%
LED Fixtures	207	151,390	30.70	5%
Incentive Bonus	12	-	-	0%
New Construction Exterior Lighting	1	135	-	0%
BMS	8	1,334,184	-	41%
Chiller	130	51,740	20.54	2%
Total	**24,728**	**3,233,597**	**253.52**	**100%**

20.2.2TIMING OF PROJECTS

According to the tracking data, in PY13 48% of ex ante kWh savings had a project install date in January of 2024. Below outlines ex ante kWh and project count by the project reported install date for projects claimed in PY13.

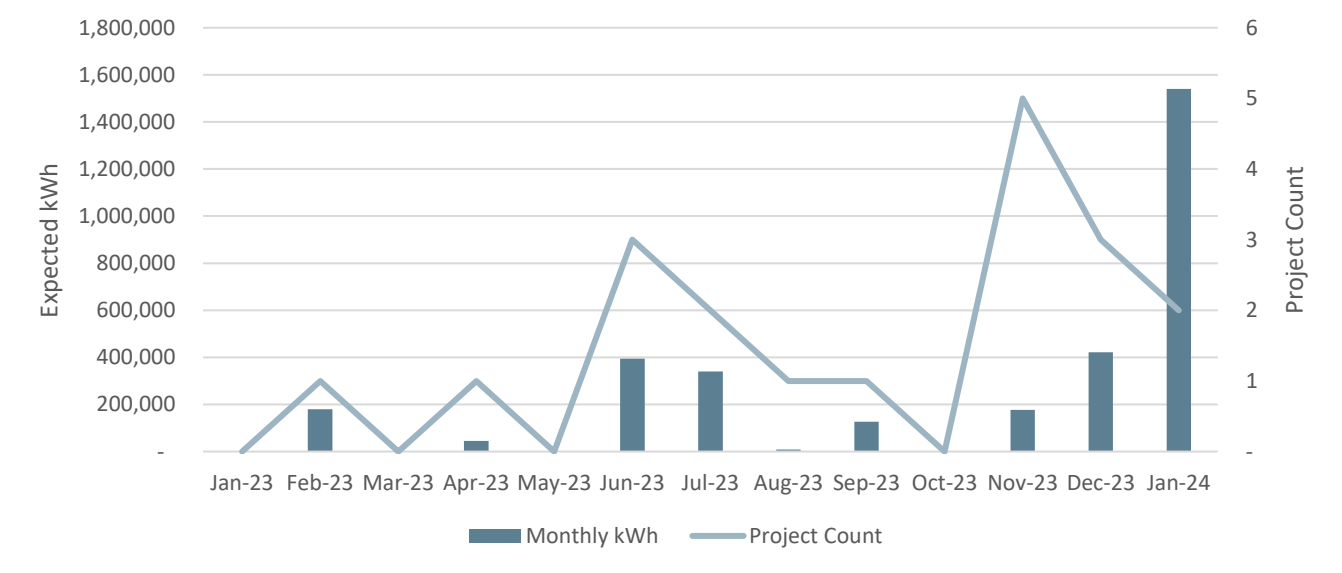


FIGURE 20-1 PFI PARTICIPATION BY PROJECT INSTALL MONTH

The program had the largest number of projects completed in January of 2024 (eight projects) and saw its largest expected energy reduction claimed in January of 2024 (2,088,823 kWh) which was 26% of the total expected energy savings for the year.

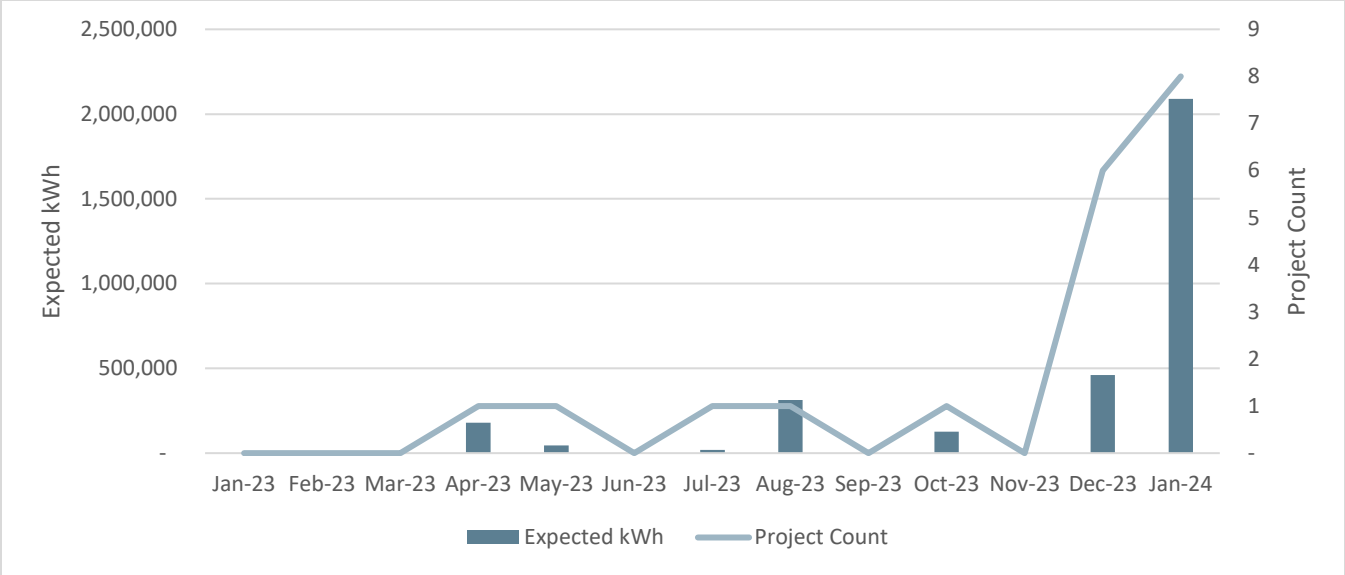


FIGURE 20-2 PFI PARTICIPATION BY PROJECT COMPLETION MONTH

20.2.3TRADE ALLIES

The program saw eleven trade allies complete projects, their participation is summarized below.

TABLE 20-7 PFI TRADE ALLY PARTICIPATION

Trade Ally	Ex Ante kWh	Project Count	Ex Ante kWh %
Trade Ally 1	958,830	6	29.7%
Trade Ally 2	143,944	2	4.5%
Trade Ally 3	26,888	1	0.8%
Trade Ally 4	1,540,226	2	47.6%
Trade Ally 5	19,778	1	0.6%
Trade Ally 6	24,523	1	0.8%
Trade Ally 7	5,014	1	0.2%
Trade Ally 8	375,354	2	11.6%
Trade Ally 9	126,947	1	3.9%
Trade Ally 10	8,129	1	0.3%
Trade Ally 11	3,963	1	0.1%

20.2.4GOAL ACHIEVEMENT

The program had a verified savings of 2,935,278 kWh and a verified peak demand reduction of 335.55 kW.

TABLE 20-8 PFI SUMMARY OF GOAL ACHIEVEMENT

Ex Post Gross Energy Savings (kWh) Goal	% to kWh Goal	*Ex Post* Gross Energy Savings (kWh)
10,799,767	27%	2,935,278

20.3 EM&V Methodology

Evaluation of the PFI offering requires the following:

- Stratified Random Sampling (as detailed in Section 3.3.) and by selecting large saving sites with certainty.
- Two On-site verifications were conducted, desk reviews of all ten sampled; and
- Interviewing program participants and trade allies.

Energy savings was estimated using proven techniques, including engineering calculations using industry standards to determine energy savings. Methods for evaluating lighting measures are described in the Small C&I Solutions Chapter, Section 1.2.1 M&V Methodology.

20.3.1SITE VISITS

There were two site visits in PY13.

20.3.2SAMPLE DESIGN

Sampling for evaluation of the program was developed using the Stratified Random Sampling procedure detailed in Section 3.3. This procedure provides 90% confidence and +/- 10% precision with a significantly reduced sample than simple random sampling would require by selecting the highest saving facilities with certainty, thereby minimizing the variance that non-sampled sites can contribute to the overall results. Table 20-9 summarizes the total participation in the PY13 PFI offering.

TABLE 20-9 PY13 PFI OFFERING PARTICIPATION AND SAMPLING SUMMARY

# Projects	Expected kWh	Expected Peak kW	Sample Size
19	3,233,597	253.52	10

The participant population was divided into four strata. Table 20-10 summarizes the strata boundaries and sample frames for the program. Table 20-10 summarizes expected savings for of both the sample and population. The achieved sampling precision was ±9.1% at 90% confidence.

TABLE 20-10 PFI OFFERING SAMPLE DESIGN

	Stratum 1	Stratum 2	Stratum3	Stratum 4	Totals
Strata boundaries (kWh)	< 100,000	100,000 - 300,000	300,001 - 500,000	500,001<	
Number of projects	10	7	1	1	**19**
Total kWh savings	351,214	1,313,356	312,811	1,256,216	**3,233,597**
Average	35,121	187,622	312,811	1,256,216	**170,189**
Standard deviation	30,126.59	60,655.91	-	-	**280,337**
Coefficient of variation	0.86	0.32	-	-	**1.65**
Final design sample	**4**	**4**	**1**	**1**	**10**

TABLE 20-11 PFI EXPECTED SAVINGS FOR SAMPLED AND NON-SAMPLED PROJECTS BY STRATUM

Stratum	Total Expected Savings	Sampled Expected Savings
1	351,214	178,412
2	1,313,356	690,380
3	312,811	312,811
4	1,256,216	1,256,216
Total	**3,233,597**	**2,437,819**

20.4 Evaluation Findings

20.4.1GROSS IMPACT FINDINGS

20.4.1.1 PFI Project Level Results

Sites chosen within each stratum were reviewed to verify installation of rebated equipment. The reviewed information was used to perform calculations to determine the ex post verified savings. The realization rates for sites within each stratum were then applied to the non-sampled sites within their respective stratum.

TABLE 20-12 SUMMARY OF PFI KWH SAVINGS FOR PFI OFFERING BY SAMPLE STRATUM

Stratum	Sample *Ex Ante* Gross Energy Savings (kWh)	Sample *Ex Post* Gross Energy Savings (kWh)	Realization Rate
1	178,412	179,014	100%
2	690,380	625,797	91%
3	312,811	-105,829	-34%
4	1,256,216	1,485,701	118%
Total	**2,437,819**	**2,184,683**	**90%**

The specific site level realization rates are shown in Table 20-13 below.

TABLE 20-13 PFI EXPECTED AND VERIFIED SAVINGS BY SAMPLED PROJECT

Project ID(s)	Facility Type	*Ex Ante* Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate
CIP_432	Large Office	312,811	(105,829)	-34%
CIP_453	Public Assembly	44,908	44,908	100%
CIP_464	Public Assembly	179,730	187,732	104%
CIP_728	Large Office	1,256,216	1,485,701	118%
CIP_757	Education: K-12	16,777	18,088	108%
CIP_766	Warehouse: Non-refrigerated	24,523	23,875	97%
CIP_814	Education: K-12	139,703	55,881	40%
CIP_783	Education: K-12	244,000	244,000	100%
CIP_827	Warehouse: Non-refrigerated	92,204	92,143	100%
CIP_794	Education: K-12	126,947	138,184	109%
Total		**2,437,819**	**2,184,683**	**90%**

20.4.1.2 PFI Program Level Results

Using the realization rates presented in Table 20-12, the evaluators extrapolated the results from the sampled projects to non-sampled projects to determine the program level verified results.

TABLE 20-14 PFI OFFERING LEVEL REALIZATION BY STRATUM

Stratum	# Sites	*Ex Ante* Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	Realization Rate kWh	*Ex Ante* Gross Demand Reductions (kW)	*Ex Post* Gross Demand Reductions (kW)	Realization Rate kW
1	10	351,214	352,623	100%	63.18	62.52	99%
2	7	1,313,356	1,202,783	92%	60.23	48.12	80%
3	1	312,811	-105,829	-34%	-	-	NA
4	1	1,256,216	1,485,701	118%	130.10	224.90	173%
Total	**19**	**3,233,597**	**2,935,278**	**91%**	**253.52**	**335.55**	**132%**

The *ex post* gross energy savings (kWh) in PY13 are 2,935,278 kWh and 335.55 kW resulting in realization rates of 91% and 132% respectively.

20.4.1.3 PFI Causes of Savings Deviations

For illustrative purposes, the Evaluators have summarized these adjustments and others in Table 20-15.

TABLE 20-15 PFI CAUSES OF VARIANCE IN KWH SAVINGS

Project ID(s)	*Ex Ante* Gross Energy Savings (kWh)	*Ex Post* Gross Energy Savings (kWh)	RR	Causes of Variance in Savings
CIP_432	312,811	(105,829)	-34%	This project was evaluated using IPMVP Option C where 24 months of billing data and weather data. The regression analysis showed that after the installation of the efficient equipment there was a signification increase in energy usage.
CIP_728	1,256,216	1,485,701	118%	Ex post analysis verified different fixture wattages and fixture counts during the desk review.
CIP_757	16,777	18,088	108%	Ex post analysis verified different fixture wattages and fixture counts during the desk review.
CIP_814	139,703	55,881	40%	This project was shifted to be a 40/60 split project where 40% of the ex-ante savings are claimed this year and the remaining 60% are evaluated in PY14.

20.4.2NET IMPACT

Participant survey responses were used to estimate the net energy impacts for the Small C&I, Large C&I, PFI, Construction Solutions offerings combined. The methodology used is described in 3.2.2. Net savings by measure can be found in the beginning of the chapter in Table 20-1 PY13 PFI Energy Savings (kWh)Table 20-1.

20.4.2.1 Avoided Replacement Costs

The Evaluators have added the benefits of avoided replacement costs (ARC). The table below summarize the ARC by measure in PFI.

Information on methodology can be found in Section 3.4.1.3 Avoided Replacement Costs.

TABLE 20-16 SUMMARY OF ARC FOR PFI

Measure	*Ex Post* Gross ARCs ($)	*Ex Post* Net ARCs ($)	NPV ARCs ($)
Screw Based LED	$1,218	$1,108	$1,108
Linear LED	$75,819	$68,996	$68,996
LED Fixtures	$19,952	$18,156	$18,156
Incentive Bonus	$0	$0	$0
New Construction Exterior Lighting	$143	$130	$130
BMS	$0	$0	$0
Chiller	$0	$0	$0
Total	**$97,133**	**$88,391**	**$88,391**

Sums may differ due to rounding.

20.4.3 PROCESS FINDINGS

The Evaluators conducted staff interviews as well as administered a participant survey and trade ally interviews.

20.4.3.1 Staff and Implementer Interviews

The following section summarizes the key findings from in-depth interviews with two ENO program staff, and two APTIM staff; ENO staff participated in one interview and APTIM staff participated in a second interview. These in-depth interviews aimed to learn more about Publicly Funded Institutions program design and operations, and the successes and challenges experienced during PY13. Interviews lasted approximately 60 minutes and were conducted using the Microsoft Teams platform. The evaluators recorded all interviews with participant permission. The following narrative summarizes these interviews.

20.4.3.1.1 *Program Description and Implementation*

The Publicly Funded Institutions (PFI) program provides financial incentives and technical services to encourage the participation of publicly funded customers. The program is designed to help this customer segment overcome barriers to energy improvement, such as higher first-cost of efficiency equipment and a lack of technical knowledge or resources.

Staff had increased the PFI's goals for PY13 based on initial interest and momentum, but that interest and momentum has stalled and the program is struggling. Despite strong outreach and marketing efforts, staff have struggled to gain traction with the typical PFI customers, such as the City of New Orleans and Sewage and Water Board. Staff attribute this lack of interest to staff changeovers at the institutions as well as the city's focus on other issue areas. Moreover, the city has changed its procurement and RFP processes which has delayed project starts.

20.4.3.2 Participant Survey

The Evaluators conducted a mixed-mode survey with customers who participated in Small C&I Solutions, Large C&I Solutions, Publicly Funded Institutions, and CI Construction Solutions to gain insight into customer

satisfaction and feedback. All customers with valid email addresses included in the program's tracking data were emailed an invitation to take the survey (n=57). Five participants responded to survey attempts. Due to the low sample size, responses were analyzed together for all four programs (Small C&I Solutions, Large C&I Solutions, Publicly Funded Institutions, and CI Construction Solutions). Full survey summary can be found in the Small C&I Solutions chapter, section 17.4.3.2.

20.4.3.3 Near Participant Trade Ally Interviews

Evaluators conducted interviews about participation in the Energy Smart Publicly Funded Institutions savings program with near-participant trade allies to gather feedback about trade ally awareness and general knowledge of energy efficiency actions and Energy Smart's programs, as well as barriers to program engagement. "Near-participant" trade allies are trade allies who have previously participated in the Energy Smart program or have expressed interest in program engagement, but not yet enrolled. Entergy Smart tracking data for the Publicly Funded Institutions savings program included 29 unique trade ally contacts in the program. Of these contacts, 14 had valid contact information. Trade allies were contacted via phone and email three times and invited to complete an interview. Two near-participants responded to an interview for a response rate of 14%.

20.4.3.3.1 *Program Strengths*

Both trade allies interviewed appreciate the Publicly Funded Institutions program for allowing it to offer more services to their clients. With the support of the program, they are able to offer more to publicly funded institutions that are looking for upgrades in energy efficiency.

> *"There is the option to bring more customers. I look at it as you want to be diversified in business, you want to have as many different options of doing electrical where you want to have a little bit of [everything]. So, it's like another opportunity I could bring to my customers and say, look here, we can do this for you." – Installer, Lighting Controls*

20.4.3.3.2 *Program Challenges*

One large challenge for trade allies is the lack of tangible resources to help sell the Energy Smart programs to customers. Both allies interviewed felt that people might be interested in the program, but that trade allies have no information, pamphlets, brochures or support to leave with customers to help inform a decision.

> *"I try to offer them the services, but usually they don't take it because it's like they just hear it. There is no documentation. So, it's kind of hard to sell them something. They can't physically see it." – Installer, Lighting Controls*

Both allies felt that the current incentives offered by the program are not always compelling. They shared that the process of receiving incentives can be challenging for smaller businesses, as they must finance the project upfront and wait for the incentive at the end. Trade allies find that often customers are just looking to fix something that is broken. They are not necessarily looking for help in upgrading something to be more energy efficient if what they have is already working. This can make selling energy efficiency upgrades available through the program more difficult.

> *"They don't want to spend that money on just upgrading everything because it works. If it doesn't work, then of course they don't mind doing it. But if it works, it's kind of hard for them to justify to just change it just because of energy, just to save power. Most of the time they just say, hey, just fix it and make it work instead upgrading it." – Installer, Lighting Controls*

20.4.3.3.3 *Deeper Trade Ally Engagement*

Entergy New Orleans can assist trade allies by providing official documentation or brochures to help contractors sell the program to customers, a sentiment expressed by both allies interviewed. The two allies interviewed suggest additional advertising of the program and/or endorsements of trade allies to help secure more customers.

> *"You got to have some type of documentation for contractors…invest the money, put down logo on it, this thing so we could bring the customers knowing that we're affiliated with your program, and then we can start bringing to customers this we got. 'I'm affiliated with the Energy Smart program, and this is what we do.'" – Installer, Lighting Controls*

Both trade allies felt that Entergy New Orleans can improve the program by offering better incentives to customers, particularly for first-time users. One trade ally shared his views around the opportunity to expand the focus of the program to include more significant improvements in buildings, such as promoting distributed energy generation or CHP which would make trade allies more valuable to their customers.

> *"I would just like to be able to offer energy resiliency to customers, even in a small way, if Entergy was so inclined. But the process itself it's a lot of work for the customer, but frankly, that's sort of a double-edged sword because we know how to do it. So, if I want to promote a project like that's just more value that I bring to the customer because I know how to navigate the program." – Consultant, Building Energy Modeling*

> *"Number one, create better incentives. That always helps people. Maybe help first time users. There's a lot of individual customers and honestly, I don't know how well it's been used by people." – Consultant, Building Energy Modeling*

20.5 Data Tracking Review

The Evaluators reviewed the tracking data provided and found the following issues. The following parameters were missing or incomplete for the program.

- Measure Specific Information: The tracking data lacked pre and post measure information such as fixture codes, fixture wattages, equipment size, and equipment efficiency.
- Facility Conditioning Type: The tracking data lacked information on the heating and cooling systems of the participating facilities. Without information on the heating fuel type, the evaluators are unable to calculate Therm savings in lighting retrofit projects.

The Evaluators note that a supplemental tracking dataset was provided for this program and a few others. This data had some additional fields. However, the Evaluators noted that there were few inconsistencies with total program kWh savings, total kW reductions, and total project counts. Since the two did not align, it was difficult to know which was the best and final to utilize in the Evaluation.

20.6 Key Findings and Recommendations

The following summarizes the key findings and conclusions from the PY13 evaluation.

- Favorable Perception of the PFI Program: Trade allies express a positive sentiment towards the PFI program, highlighting its role in expanding their service offerings to clients. Both allies appreciate the opportunities afforded by the program to deliver enhanced energy efficiency solutions to publicly funded institutions seeking upgrades. By leveraging the support of the program, trade allies can effectively address the energy efficiency needs of institutional clients, thereby fostering greater sustainability and cost savings within these sectors.
- Barriers to Customer Engagement: Trade allies identify a lack of resources and informational materials as significant barriers to customer engagement. They express concern that despite potential interest from customers, the absence of informational brochures or support materials hinders their ability to effectively inform clients about the program. This gap in resources limits their capacity to educate customers and guide them towards informed decisions regarding energy efficiency upgrades. Providing comprehensive informational resources and support tools can empower trade allies to better communicate the benefits of the program and facilitate customer engagement.
- Challenges with Current Incentive Structure: Both trade allies voice concerns regarding the effectiveness of the current incentive structure. They note that the incentives offered may not always be compelling, particularly for smaller businesses. Moreover, the process of receiving incentives poses challenges, as trade allies often have to finance projects upfront and wait for incentives upon project completion. Additionally, trade allies highlight the difficulty in selling energy efficiency upgrades to customers who may only seek repairs for malfunctioning systems, rather than investing in upgrades for improved efficiency. Addressing these challenges may require reevaluating the incentive structure to make it more attractive and accessible to trade allies, as well as developing strategies to educate customers about the long-term benefits of energy efficiency upgrades.

There following were recommendations to the PFI in PY13.

- Enhanced Marketing Support: The program can play a pivotal role in supporting trade allies by providing comprehensive marketing materials and official documentation. These resources can serve as valuable tools for contractors to effectively communicate the benefits of the program to potential customers. Suggestions include additional advertising efforts to raise awareness of the program and endorsements provided by the program to endorse trade allies, thereby enhancing their credibility and helping them secure more customers. By equipping trade allies with the necessary marketing support, the program can facilitate greater outreach and engagement within the community, ultimately driving increased participation in the program.

Consideration of Incentive Structure: Interviewed trade allies suggest that the program should consider revising the incentive structure to better incentivize customers, particularly those who are first-time users of the program. There is a consensus among trade allies that offering more attractive incentives could significantly enhance the appeal of the program and encourage broader participation. Additionally, trade allies advocate for expanding the program's focus to include more substantial improvements in buildings, such as promoting distributed energy generation or combined heat and power (CHP) systems. By incentivizing these advanced energy solutions, the program can position trade allies as valuable partners to their customers, driving innovation and sustainability in building practices.

21 APPENDIX A: COMMERCIAL SITE REPORTS

Project Number CIP_414
Program Large Commercial & Industrial Solutions

Project Background

The participant is an office that received incentives from Entergy New Orleans for completing a retrofit on their facility's chiller systems. During a desk review, the evaluators verified that the participant had installed:

- (2) Air Cooled Chillers

M&V Methodology

The Evaluators confirmed installation of all units listed in the project application. The specifications of the equipment installed at this site are presented in the table below.

Savings Parameters

Equipment	Quantity	Building Type	Tons	Deemed Energy (kWh/Ton)	Deemed Demand (kW/Ton)
Trane Centrifugal Air Cooler	2	Large Office	731	186	0.051

Savings Calculations

The Evaluators performed a desk review of the project along with deemed savings approaches outlined in the New Orleans TRM v6.1. Below are the findings of the evaluator's desk review.

Thermostat kWh Savings Calculations.

Measure Type	Measure Quantity	Expected kWh Savings	Realized kWh Savings	kWh Realization Rate
Chillers	2	201,756	368,424	182.6%
Total	**2**	**201,756**	**368,424**	**182.6%**

Thermostat kW Savings Calculations.

Measure Type	Measure Quantity	Expected kW Savings	Realized kW Savings	kWh Realization Rate
Chillers	2	90.64	277.8	306.5%
Total	**2**	**90.64**	**277.8**	**306.5%**

Results

Project CIP_414 has a realization rate of 183% for kWh and 307% for kW.

Verified Gross Savings & Realization Rates

Measure	Verified			
	kWh Savings	kW Savings	kWh Realization Rate	kW Realization Rate
Total Savings	368,424	277.8	183%	307%

The realization rate is off due to the ex-post analysis verifying the efficient equipment is an air-cooled chiller when the ex-ante savings amount is based off the deemed savings value for a water-cooled chiller.

Project Number CIP_471

Program Commercial & Industrial Construction Solutions

Project Background

The participant is a free-standing retail facility that received incentives from Entergy New Orleans for installing new construction energy efficient lighting, high efficiency heat pumps, a solid door refrigerator, dishwasher, and a convection oven. The Evaluators verified that the following had been installed:

- (3) 21 W LED Fixtures
- (23) 16 W LED Fixtures
- (4) 60 W LED Fixtures
- (11) 60 W LED Fixtures
- (2) 10 W LED Fixtures
- (3) 5 W LED Fixtures
- (1) 21 W LED Fixtures
- (1) High Efficiency Heat Pump
- (2) High Efficiency Dishwashers
- (62) 16 W LED Fixtures
- (8) 60 W LED Fixtures
- (7) 60 W LED Fixtures
- (4) 10 W LED Fixtures
- (1) 25 W LED Fixtures
- (2) 24 W LED Fixtures
- (6) 2 W LED Fixtures
- (3) Solid Door Refrigerator
- (1) High Efficiency Convection Oven

Calculation Parameters

The Evaluators conducted a site visit to verify efficient equipment for the desk review. Saving calculations were performed using savings methodology described in section D.6.3 Commercial Lighting Efficiency, D.3.4 Commercial Air Conditioner and Heat Pump Tune-Up, D.4.3 Solid Door Refrigerators and Freezers, D.5.9 Energy Star Commercial Dishwashers, and D.5.2 Convection Ovens of the NO TRM V6.1. Deemed savings parameters applicable to this site are shown below:

Lighting Savings Parameters

Building Type	Heating Type	Annual Hours	IEF_E	IEF_D	CF
Retail: Free Standing	Heat Pump	3,515	1.02	1.2	0.9

Savings Calculations

Using the values from the table above, the Evaluators calculated lighting savings as follows:

Lighting Retrofit kWh Savings Calculations

Measure	Quantity (Fixtures)	Wattage	Annual Operating Hours	Realized kWh Savings	IEF_E
21 W LED Fixtures	3	21	3,515	-	1.02
16 W LED Fixtures	23	16	3,515	-	1.02
60 W LED Fixtures	4	60	3,515	-	1.02
60 W LED Fixtures	11	60	3,515	-	1.02
10 W LED Fixtures	2	10	3,515	-	1.02
5 W LED Fixtures	3	5	3,515	-	1.02
21 W LED Fixtures	1	21	3,515	-	1.02
16 W LED Fixtures	62	16	3,515	-	1.02
60 W LED Fixtures	8	60	3,515	-	1.02
60 W LED Fixtures	7	60	3,515	-	1.02
10 W LED Fixtures	4	10	3,515	-	1.02
25 W LED Fixtures	1	25	3,515	-	1.02
24 W LED Fixtures	2	24	3,515	-	1.02
2 W LED Fixtures	6	2	3,515	-	1.02
Total				**14,556**	

Results

The kWh and kW realization rates for project CIP_471 are 69% and 85%, respectively.

Discrepancies in the kWh and kW realization rate can be attributed to a difference in calculation methods and building types; ex post calculations utilized NO TRM V6.1 savings parameters for a free-standing retail facility. The ex-ante savings values were calculated using averages of deemed savings values for the non-lighting equipment where the ex post analysis used site specific equipment information. The new construction lighting ex ante estimate did not follow the New Orleans TRM and applied an unknown correction factor to the final savings that the evaluators did not include.

Verified Gross Savings & Realization Rates

Measure	Verified			
	kWh Savings	kW Savings	kWh Realization Rate	kW Realization Rate
Custom New Construction Lighting	14,556	4.38	79%	100%
High Efficiency Heat Pump	2,333	0.60	156%	114%
Solid Door Refrigerator	1,893	0.21	81%	80%
ENERGY STAR Commercial Dishwasher	6,342	0.80	42%	41%
Convection Oven	1,933	0.37	97%	97%
Total	**27,057**	**6.36**	**69%**	**85%**

Project Number CIP_600
Program Large Commercial and Industrial Solutions

Project Background

The participant is a medical facility that received incentives from Entergy New Orleans for retrofitting energy efficient lighting. The Evaluators verified that the following had been installed:

- (2,133) 12.5W 4-foot T8 LED lamps replacing (2,133) 31W Linear Fluorescent fixtures.
- (92) 7W 2-foot T8 LED lamps replacing (92) 18W Linear Fluorescent fixtures.
- (204) 17W U-Tube T8 LED lamps replacing (204) 31W U-Tube Fluorescent lamps.
- (56) 15.5W U-Tube T8 LED lamps replacing (56) 31W U-Tube Fluorescent lamps.
- (28) 12W 3-foot T8 LED lamps replacing (28) 26W Linear Fluorescent lamps.

Calculation Parameters

The Evaluators confirmed installation of all fixtures listed in the project application. Savings for the measures were calculated using prescriptive savings values listed in Section D.6 of the NO TRM V6.1. The specific values used in calculating savings for this site are presented in the table below.

Prescriptive Savings Parameters

Facility or Space Type	AOH	CF	IEF_E	IEF_D
Health Care: Out-Patient	3,386	.77	1.09	1.2

Savings Calculations

Using values from the invoice and from the table above, the Evaluators calculated lighting savings as follows:

Lighting Retrofit kWh Savings Calculations

Prescriptive Measure	Measure Quantity	Realized kWh Savings
F41ILL to LED012.5-FIXT	2,133	145,638
F21ILL to LED007-FIXT	92	3,735
FU1ILL to LED017-FIXT	204	10,541
FU1ILL to LED015.5-FIXT	56	3,204
F31ILL to LED012-FIXT	28	1,447
Total	2,513	164,565

Lighting Retrofit kW Reduction Calculations

Prescriptive Measure	Measure Quantity	Realized kW Savings
F41ILL to LED012.5-FIXT	2133	36.5
F21ILL to LED007-FIXT	92	0.9
FU1ILL to LED017-FIXT	204	2.6
FU1ILL to LED015.5-FIXT	56	0.8
F31ILL to LED012-FIXT	28	0.4
Total	2,513	41.2

Results

The kWh and kW reduction realization rates for project CIP_600 are 88% and 86%, respectively.

Table D. Verified Gross Savings & Realization Rates

Measure	Verified			
	kWh Savings	kW Savings	kWh Realization Rate	kW Realization Rate
LED Lighting Retrofits	164,565	41.2	88%	86%

The ex-ante post calculator was locked and didn't provide line by line savings and the pre calculator provided savings that didn't match the tracking data. This meant the line-by-line savings and calculation methods were unknown and the precise source of the low realization rates were difficult to determine.

Based on the calculations provided, the reason for low realization rates is likely due to uncertainty of baseline fixture codes, differences in hours of use, and discrepancies between expected wattage and verified wattage.

Project Number CIP_627
Program Large Commercial and Industrial Solutions

Project Background

The participant is an auto retailer that received incentives from Entergy New Orleans for retrofitting energy efficient lighting. The Evaluators verified that the following had been installed:

- (54) 5W screw in LED lamps replacing (54) 26W Halogen lamps.
- (23) 25W 4-foot LED lamps replacing (23) 4' 1L T5 High output linear fluorescent lamps.
- (384) 14W 4-foot LED fixtures replacing (384) 4' 1L linear fluorescent fixtures.
- (424) 14W 4-foot LED fixtures replacing (424) 4' 1L linear fluorescent fixtures.
- (2) 15W U-Bend LED lamps replacing (2) U-Bend Linear Fluorescent fixtures.
- (16) 15W HID LED lamps replacing (16) HID Metal Halide lamps.
- (25) 45W HID LED lamps replacing (25) HID Metal Halide Lamps (outdoor).
- (2) 9W LED lamps replacing (2) 100W Halogen lamps.

Calculation Parameters

The Evaluators verified installation of all fixtures listed in the project application. Savings for the measures were calculated using prescriptive savings values listed in the NO TRM V6.1. The specific values used in calculating savings at this site are presented in the table below. The closest space type to vehicle and repair shop was manufacturing.

Prescriptive Savings Parameters

Facility Area	Space Type	AOH	CF	IEFE	IEFD
Showroom and NW Entrance	Retail: Freestanding	3,515	0.9	0.87	1.2
Office and Misc	Office (attached)	4,728	0.77	0.87	1.2
Shop and Maintenance	Manufacturing	5,740	0.73	0.87	1.2
Canopy	Exterior	4,319	0	1.0	1.0

Savings Calculations

Using values from the table above, the Evaluators calculated lighting savings as follows:

Lighting Retrofit kWh Savings Calculations

Prescriptive Measure	Measure Quantity	Expected kWh Savings	Realized kWh Savings	kWh Realization Rate
H26/1to LED015-FIXT	54	5,090	3,468	68%
F41GPHL-H to LED015-FIXT	23	2,993	2,743	92%
F41ILL to LED009-FIXT	384	31,024	19,963	64%
F41ILL to LED009-FIXT	424	34,256	29,649	87%
FU1ILL to LED009-FIXT	2	148	128	86%
MH32/1	16	1,221	2,157	177%
MH250/1	25	25,535	26,238	103%
H100/1	2	817	557	68%
Total	**930**	**101,085**	**84,903**	**84%**

Lighting Retrofit kW Reduction Calculations

Measure	Measure Quantity	Expected kW Savings	Realized kW Savings	kW Realization Rate
H26/1to LED015-FIXT	54	1.04	1.22	117%
F41GPHL-H to LED015-FIXT	23	0.63	0.97	154%
F41ILL to LED009-FIXT	384	6.6	7.05	107%
F41ILL to LED009-FIXT	424	7.28	6.66	91%
FU1ILL to LED009-FIXT	2	0.03	0.03	100%
MH32/1	16	0.25	0.38	152%
MH250/1	25	0	0	n/a
H100/1	2	0.17	0.20	118%
Total	930	16.00	16.51	103%

Results

The kWh and kW reduction realization rates for project CIP-627 are 84% and 103%, respectively. The reason for low realization rates is primarily from the building space type chosen for each space. The ex-ante chose office for the whole facility and the evaluator chose space types that seemed appropriate for each space.

Verified Gross Savings & Realization Rates

Measure	Verified			
	kWh Savings	kW Savings	kWh Realization Rate	kW Realization Rate
LED Lighting Retrofits	84,903	16.51	84%	103%

Project Number CIP_661
Program Small Commercial and Industrial Solutions

Project Background
The participant is an auto retail parts and service facility that received incentives from Entergy New Orleans for retrofitting energy efficient lighting. The Evaluators verified that the following had been installed:

- (255) 12W 4-foot T8 LED lamps replacing (255) 27W Linear Fluorescent fixtures.
- (4) 9W LED screw-ins replacing (4) 60W Incandescent bulbs.
- (2) 25W LED screw-ins replacing (2) 135W Incandescent bulbs.
- 2W LED Exit Sign replacing (1) 12W Compact Fluorescent Exit Sign.

Calculation Parameters
The Evaluators confirmed installation of all fixtures listed in the project application. Savings for the measures were calculated using prescriptive savings values listed in the NO TRM V6.1. The specific values used in calculating savings for this site are presented in the table below.

Prescriptive Savings Parameters

Measure	Space Type	AOH	CF	Controls CF	IEFE	IEFD
F41IRLL to LED012-FIXT	Retail: Other	4,312	0.9	0.0	1.09	1.2
F41IRLL to LED012-FIXT	Retail: Other	4,312	0.9	0.3	1.09	1.2
F41IRLL to LED012-FIXT	Retail: Other	4,312	0.9	0.3	1.09	1.2
H60/1 to LED009-FIXT	Retail: Other	4,312	0.9	0.3	1.09	1.2
F41IRLL to LED012-FIXT	Retail: Other	4,312	0.9	0.3	1.09	1.2
F41IRLL to LED012-FIXT	Retail: Other	4,312	0.9	0.0	1.09	1.2
CFM120/1-L to LED025-FIXT	Retail: Other	4,312	0.9	0.0	1.09	1.2
F41IRLL to LED012-FIXT	Retail: Other	4,312	0.9	0.3	1.09	1.2
F41IRLL to LED012-FIXT	Retail: Other	4,312	0.9	0.0	1.09	1.2
F41IRLL to LED012-FIXT	Retail: Other	4,312	0.9	0.0	1.09	1.2
CF12/1-SCRW to LED002-FIXT	Retail: Other	4,312	0.9	0.0	1.09	1.2

Savings Calculations
Using values from the table above, the Evaluators calculated lighting savings as follows:

Lighting Retrofit kWh Savings Calculations

Prescriptive Measure	Measure Quantity	Expected kWh Savings	Realized kWh Savings	kWh Realization Rate
F41IRLL to LED012-FIXT	60	4,653	4,230	91%
F41IRLL to LED012-FIXT	6	818	525	64%
F41IRLL to LED012-FIXT	3	585	262	45%
H60/1 to LED009-FIXT	4	1,311	1,010	77%
F41IRLL to LED012-FIXT	6	818	525	64%
F41IRLL to LED012-FIXT	72	5,584	5,076	91%
CFM120/1-L to LED025-FIXT	2	903	1,034	115%
F41IRLL to LED012-FIXT	2	517	175	34%
F41IRLL to LED012-FIXT	50	4,113	3,525	86%
F41IRLL to LED012-FIXT	56	4,343	3,948	91%
CF12/1-SCRW to LED002-FIXT	1	97	47	48%
Total	**262**	**23,742**	**20,356**	**86%**

Lighting Retrofit kW Reduction Calculations

Prescriptive Measure	Measure Quantity	Expected kW Savings	Realized kW Savings	kW Realization Rate
F41IRLL to LED012-FIXT	60	1.10	0.97	88%
F41IRLL to LED012-FIXT	6	0.22	0.12	55%
F41IRLL to LED012-FIXT	3	0.17	0.06	35%
H60/1 to LED009-FIXT	4	0.33	0.23	70%
F41IRLL to LED012-FIXT	6	0.22	0.12	55%
F41IRLL to LED012-FIXT	72	1.33	1.17	88%
CFM120/1-L to LED025-FIXT	2	0.21	0.24	114%
F41IRLL to LED012-FIXT	2	0.15	0.04	27%
F41IRLL to LED012-FIXT	50	0.98	0.81	83%
F41IRLL to LED012-FIXT	56	1.03	0.91	88%
CF12/1-SCRW to LED002-FIXT	1	0.01	0.01	100%
Total	**262**	**5.75**	**4.7**	**82%**

Results

The kWh and kW reduction realization rates for project CIP-661 are 86% and 82%, respectively. The primary reason for low realization rates is the difference in deemed lighting control methods. The ex-ante used set deemed values for peak kW and kWh controls savings and the ex-post used methods from the New Orleans TRM V6.1. In addition, uncertainty of baseline fixture codes, and discrepancies between reported wattages and verified wattages impacted the realization rate.

Verified Gross Savings & Realization Rates

Measure	Verified			
	kWh Savings	kW Savings	kWh Realization Rate	kW Realization Rate
LED Lighting Retrofits	20,356	4.69	86%	82%

Project Number CIP_693
Program Large Commercial & Industrial Solutions

Project Background

The participant is an office facility that received incentives from Entergy New Orleans for retrofitting energy efficient lighting. The Evaluators verified that the following had been installed:

- (147) 38W LED Fixture replacing (147) T8 Fluorescent Lamps
- (6) 16W Screw-Based LED Fixture replacing (6) Compact Fluorescent Lamps
- (12) 32W Screw-Based LED replacing (12) Compact Fluorescent Lamps

Calculation Parameters

The Evaluators conducted a site visit of the project and determined that the project comprised of a prescriptive lighting installation. Saving calculations were performed using the savings methodology described in Commercial Lighting Efficiency section of the NO TRM V6.1. Deemed savings parameters applicable to this site are shown below:

Prescriptive Savings Parameters

Building Type	Heating Type	Annual Hours	IEFE	IEFD	CF
Office	Electrical Resistance	5,159	0.87	1.2	0.77

Savings Calculations

Using the values from the table above, the Evaluators calculated lighting savings as follows:

Prescriptive Lighting Retrofit kWh Savings Calculations

Measure	Quantity (Fixtures)		Wattage		AOH	Expected kWh Savings	Realized kWh Savings	IEFE	Realization Rate
	Pre	Post	Pre	Post					
T8 Fluorescent to 38W LED	147	147	85	38	5,159	20,156	31,010	0.87	154%
Compact Fluorescent to 16W LED	6	6	50	16	5,159	595	916	0.87	154%
Compact Fluorescent to 32W LED	12	12	50	32	5,159	630	969	0.87	154%
Total						**21,382**	**32,895**		**154%**

Prescriptive Lighting Retrofit kW Reduction Calculations

Measure	Quantity (Fixtures)		Wattage		CF	Expected kW Savings	Realized kW Savings	IEFD	Realization Rate
	Pre	Post	Pre	Post					
T8 Fluorescent to 38W LED	147	147	85	38	0.77	5.39	6.38	1.2	118%
Compact Fluorescent to 16W LED	6	6	50	16	0.77	0.16	0.19	1.2	119%
Compact Fluorescent to 32W LED	12	12	50	32	0.77	0.17	0.20	1.2	118%
Total						**5.72**	**6.77**		**118%**

Results

The kWh and kW realization rates for project CIP_693 are 154% and 118%, respectively.

Discrepancies in the kWh and kW realization rate are due to the ex-ante estimate calculating the baseline wattages based on individual lamps but did not consider multi lamp fixture wattages.

Verified Gross Savings & Realization Rates

Measure	Verified			
	kWh Savings	kW Savings	kWh Realization Rate	kW Realization Rate
T8 Fluorescent to 38W LED	20,156	6.38	154%	118%
Compact Fluorescent to 16W LED	595	0.19	154%	119%
Compact Fluorescent to 32W LED	630	0.20	154%	118%
Total	**21,382**	**6.77**	**154%**	**118%**

Project Number CIP_702
Program Large Commercial & Industrial Solutions

Project Background

The participant is an office site that received incentives from ENO for implementing energy efficient lighting. The implementers verified that the participant had installed:

- (182) 48 W LED Fixtures replacing (176) T12 Fluorescent fixtures;
- (2) 31 W LED Fixtures replacing (265) T12 Fluorescent fixtures;

M&V Methodology

The evaluators found that the lighting wattages deviated from those listed in the project application. Verified DLC wattages were used in ex post savings calculations. The provided project calculator had different expected savings than the tracking data reported. Savings for the lighting measures were calculated using Louisiana stipulated deemed values by space type for hours of use, along with a stipulated peak Coincident Factor (CF), Interactive effects factor for energy (IEF_E) and Interactive effects factor for demand (IEF_D) determined using local weather data and ENO peak parameters. The deemed values used in calculating savings are presented in the table below.

Deemed Savings Parameters

Building Type	Heating Type	Annual Hours	IEF_E	IEF_D	CF
Office	Resistance	5,159	0.87	1.20	1.00

Savings Calculations

Using deemed values from the table above, the evaluators calculated lighting savings as follows:

$$\text{Annual kWh Savings} = \left(\text{kW}_{\text{base}} * \text{AOH}_{\text{base}} - \text{kW}_{\text{post}} * \text{AOH}_{\text{post}}\right) * \text{IEF}_{\text{E}}$$

Parameters for kWh Savings Calculation of Lighting Retrofit Measures

kW_{base}	Total Baseline fixtures x $W/Fixture_{base}$ / 1000 W/kW
kWpost	Total Installed fixtures x $W/Fixture_{post}$ / 1000 W/kW
AOH_{base}	Annual Operating Hours of Baseline Fixtures
AOH_{post}	Annual Operating Hours of Installed Fixtures
IEF_E	Heating/Cooling Energy Interactive Effects Factor

Following this, the evaluators calculated peak kW savings. This is based upon Louisiana defined peak hours during summer weekdays. Peak kW savings are calculated as:

$$\text{Peak kW Savings} = \left(\text{kW}_{\text{base}} - \text{kW}_{\text{post}}\right) * \text{CF} * \text{IEF}_{\text{D}}$$

Parameters for Peak Demand (kW) Savings Calculation of Lighting Retrofit Measures

kW_{base}	Total Baseline fixtures x $W/Fixture_{base}$ / 1000 W/kW
kW_{post}	Total Installed fixtures x $W/Fixture_{post}$ / 1000 W/kW
CF	Peak Demand Coincident Factor, % Time During the Peak Period in Which Lighting is Operating
IEF_D	Heating/Cooling Demand Interactive Effects Factor

Lighting Retrofit kWh Savings Calculations

Measure	Quantity (Fixtures)		Wattage		AOH	Expected kWh Savings	Realized kWh Savings	IEF_E	Realization Rate
	Base	Post	Base	Post					
T-12 Fluorescent to 48 W LED Fixture	176	182	290	48	5,159	-	229,084	0.87	-
T-12 Fluorescent to 31 W LED Fixture	5	2	145	31	5,159	49,263	2,975	0.87	6.04%
Total						**49,263**	**232,060**	**0.87**	**471.1%**

Lighting Retrofit kW Savings Calculations

Measure	Quantity (Fixtures)		Wattage		CF	Expected kW Savings	Realized kW Savings	IEF_D	Realization Rate
	Base	Post	Base	Post					
T-12 Fluorescent to 48 W LED Fixture	176	182	290	48	1.00	-	47.2	1.20	-
T-12 Fluorescent to 31 W LED Fixture	5	2	145	31	1.00	3.42	0.61	1.20	17.9%
Total						**3.42**	**47.77**	**1.20**	**1395.0%**

Results

Project CIP_702 has a realization rate of 471% for kWh and 1395% for kW. The Evaluators believe the realization rate discrepancy is due to an error in the ex-ante calculations. The Ex-ante estimate do not appear to match the tracking data and the discrepancies are not clear.

Verified Gross Savings & Realization Rates

Verified			
kWh Savings	kW Savings	kWh Realization Rate	kW Realization Rate
232,060	47.77	471.1%	1395.0%

Project Number CIP_703

Program Commercial & Industrial Construction Solutions

Project Background

The participant is an out-patient health care facility that received incentives from Entergy New Orleans for installing new construction energy efficient lighting, a high efficiency heat pump, and a Fan VSD Retrofit. The Evaluators verified that the following had been installed:

- (27) 11 W LED Fixtures
- (12) 4 W LED Fixtures
- (1) 6 W LED Fixtures
- (12) 20 W LED Fixtures
- (3) High Eff Heat Pump Units
- (9) 40 W LED Fixtures
- (10) 11 W LED Fixtures
- (9) 4 W LED Fixtures
- (1) 2.4 HP HVAC Fans

Calculation Parameters

The Evaluators conducted a desk review of the project and determined that the project comprised of a custom lighting installation. Saving calculations were performed using savings methodology described in section D.6.3 Commercial Lighting Efficiency, and D.3.4 Commercial Air Conditioner and Heat Pump Tune-Up of the NO TRM V6.1 and using a Power Load analysis. Deemed savings parameters applicable to this site are shown below:

Table A. New Construction Lighting Savings Parameters

Building Type	Heating Type	Annual Hours	IEF_E	IEF_D	CF
Health Care: Out-Patient	Heat Pump	3,386	1.02	1.2	0.9
Exterior	Heat Pump	4,319	1.00	1.0	0.0

Table B. High Efficiency Heat Pump Deemed Savings Parameters

Building Type	kWh/Ton	kW/Ton
Health Care: Out-Patient	555	0.2307

Table B. HP VSD Fan Savings Parameters

Annual Hours	Full Load Power (kW)	HP
1,989	1.5	2.4

Savings Calculations

Using the values from the tables above, the Evaluators calculated savings as follows:

Table B. New Construction Lighting kWh Savings Calculations

Measure	Quantity (Fixtures)	Wattage	Annual Operating Hours	Realized kWh Savings	IEF_E
11 W LED Fixtures	27	11	3,386	799	1.02
4 W LED Fixtures	12	4	3,386	1,718	1.02
6 W LED Fixtures	1	6	3,386	1,873	1.02
20 W LED Fixtures	12	20	3,386	1,009	1.02
40 W LED Fixtures	9	40	3,386	566	1.02
11 W LED Fixtures	10	11	4,319	201	1.00
4 W LED Fixtures	9	44	4,319	524	1.00

Total	**6,630**	

Table C. New Construction Lighting kW Reduction Calculations

Measure	Quantity (Fixtures)	Wattage	CF	Realized kW Savings	IEFD
11 W LED Fixtures	27	11	0.77	0.20	1.2
4 W LED Fixtures	12	4	0.77	0.43	1.2
6 W LED Fixtures	1	6	0.77	0.47	1.2
20 W LED Fixtures	12	20	0.77	0.25	1.2
40 W LED Fixtures	9	40	0.77	0.14	1.2
11 W LED Fixtures	10	11	0.77	-	1.0
4 W LED Fixtures	9	44	0.77	-	1.0
			Total	**1.49**	

Table B. High Efficiency Heat Pump kWh Savings Calculations

Measure	Unit Quantity	Cooling Capacity (Tons)	Expected kWh Savings	Realized kWh Savings	Realization Rate
High Efficiency HP	1	3	1,795	1,665	93%
		Total	**1,795**	**1,665**	**93%**

Table B. High Efficiency Heat Pump kW Reduction Calculations

Measure	Unit Quantity	Cooling Capacity (Tons)	Expected kW Savings	Realized kW Savings	Realization Rate
High Efficiency HP	1	3	0.63	0.69	110%
		Total	**0.63**	**0.69**	**110%**

Table B. HP VSD Fan kWh Savings Calculations

Measure	Unit Quantity	HP	Expected kWh Savings	Realized kWh Savings	Realization Rate
HP VSD Fan	1	2.4	1,489	1,490	100%
		Total	**1,489**	**1,490**	**100%**

Table B. HP VSD Fan kWh Savings Calculations

Measure	Unit Quantity	HP	Expected kW Savings	Realized kW Savings
HP VSD Fan	1	2.4	0.00	0.21
		Total	**0.00**	**0.21**

Results

The kWh and kW realization rates for project CIP_703 are 73% and 112%, respectively. The reason for the realization rate discrepancy is due to a difference in savings methodologies. The ex ante analysis applied an unknown correction factor to the lighting savings that was not included in the TRM methodology.

Table G. Verified Gross Savings & Realization Rates

Measure	Verified			
	kWh Savings	kW Savings	kWh Realization Rate	kW Realization Rate
Custom New Construction Lighting	6,630	1.49	66%	99%
High Efficiency Heat Pump	1,665	0.69	93%	110%
HP VSD Fan	1,490	0.21	100%	-
Total	**9,785**	**2.39**	**73%**	**112%**

Project Number CIP_706
Program Large Commercial & Industrial Solutions

Project Background

The participant is an office facility that received incentives from Entergy New Orleans for retrofitting energy efficient lighting. The Evaluators verified that the following had been installed:

- (98) 34W LED Fixture replacing (98) T8 Fluorescent Lamps
- (1) 34W LED Fixture replacing (1) T8 Fluorescent Lamps

Calculation Parameters

The Evaluators conducted a desk review of the project and determined that the project comprised of a custom lighting installation. Saving calculations were performed using the savings methodology described in section D.6.3 Commercial Lighting Efficiency of the New Orleans TRM6.1. Deemed savings parameters applicable to this site are shown below:

Table A. Custom Savings Parameters

Building Type	Heating Type	Annual Hours	IEF_E	IEF_D	CF
Office	Electrical Resistance	5,159	0.87	1.2	0.77

Savings Calculations

Using the values from Table A above, the Evaluators calculated lighting savings as follows:

Table B. Custom Lighting Retrofit kWh Savings Calculations

Measure	Quantity (Fixtures)		Wattage		AOH	Expected kWh Savings	Realized kWh Savings	IEF_E	Realization Rate
	Base	Post	Base	Post					
T8 Fluorescent to 34W LED	98	98	112	34	5,159	3,8268	34,309	0.87	90%
T8 Fluorescent to 34W LED	1	1	58	34	5,159	148	108	0.87	73%
					Total	**38,416**	**34,417**		**90%**

Table C. Custom Lighting Retrofit kW Reduction Calculations

Measure	Quantity (Fixtures)		Wattage		CF	Expected kW Savings	Realized kW Savings	IEFD	Realization Rate
	Base	Post	Base	Post					
T8 Fluorescent to 34W LED	98	98	112	34	0.77	7.88	7.06	1.2	90%
T8 Fluorescent to 34W LED	1	1	58	34	0.77	0.03	0.02	1.2	67%
					Total	**7.91**	**7.09**		**90%**

Results

The kWh and kW realization rates for project CIP_706 are 90% and 90%, respectively.
Discrepancies in the kWh and kW realization rate were difficult to due to the evaluators verifying a higher post fixture wattage than was used in the ex-ante estimate.

Table G. Verified Gross Savings & Realization Rates

Measure	Verified			
	kWh Savings	kW Savings	kWh Realization Rate	kW Realization Rate
T8 Fluorescent to 34W LED	34,309	7.06	90%	90%
T8 Fluorescent to 34W LED	108	0.02	73%	67%
Total	**34,417**	**7.09**	**90%**	**90%**

Project Number CIP_711
Program Large Commercial &Industrial Solutions

Project Background

The participant is a manufacturing site that received incentives from Entergy New Orleans for implementing energy efficient lighting. The implementers verified that the participant had installed:

- (341) 23 W LED Fixtures replacing (3341) T8 Fluorescent fixtures;
- (265) 40 W LED Fixtures replacing (265) T8 Fluorescent fixtures;
- (98) 44 W LED Fixtures replacing (98) T8 Fluorescent fixtures;
- (4) 16 W LED Fixtures replacing (4) U-Tube Fluorescent fixtures;
- (15) 20 W LED Screw-Based Fixtures replacing (15) Halogen Lamps;
- (6) 185 W LED Fixtures replacing (6) Metal Halide fixtures;
- (2) 185 W LED Fixtures replacing (2) T8 Fluorescent fixtures;
- (5) 10 W LED Screw-Based Fixtures replacing (10) T8 Fluorescent fixtures;

M&V Methodology

The evaluators found that the lighting wattages deviated from those listed in the project application. Verified DLC wattages were used in ex post savings calculations. The provided project calculator had different expected savings than the tracking data reported. Savings for the lighting measures were calculated using Louisiana stipulated deemed values by space type for hours of use, along with a stipulated peak Coincident Factor (CF), Interactive effects factor for energy (IEF_E) and Interactive effects factor for demand (IEF_D) determined using local weather data and ENO peak parameters. The deemed values used in calculating savings are presented in the table below.

Deemed Savings Parameters

Building Type	Heating Type	Annual Hours	IEF_E	IEF_D	CF
Manufacturing	Gas	5,740	1.09	1.20	1.00

Savings Calculations

Using deemed values from the table above, the evaluators calculated lighting savings as follows:

$$\text{Annual kWh Savings} = \left(\text{kW}_{\text{base}} * \text{AOH}_{\text{base}} - \text{kW}_{\text{post}} * \text{AOH}_{\text{post}}\right) * \text{IEF}_{\text{E}}$$

Parameters for kWh Savings Calculation of Lighting Retrofit Measures

kW_{base}	Total Baseline fixtures x $W/Fixture_{base}$ / 1000 W/kW
kWpost	Total Installed fixtures x $W/Fixture_{post}$ / 1000 W/kW
AOH_{base}	Annual Operating Hours of Baseline Fixtures
AOH_{post}	Annual Operating Hours of Installed Fixtures
IEF_E	Heating/Cooling Energy Interactive Effects Factor

Following this, the evaluators calculated peak kW savings. This is based upon Louisiana defined peak hours during summer weekdays. Peak kW savings are calculated as:

$$\text{Peak kW Savings} = \left(\text{kW}_{\text{base}} - \text{kW}_{\text{post}}\right) * \text{CF} * \text{IEF}_{\text{D}}$$

Parameters for Peak Demand (kW) Savings Calculation of Lighting Retrofit Measures

kW_{base}	Total Baseline fixtures x $W/Fixture_{base}$ / 1000 W/kW
kW_{post}	Total Installed fixtures x $W/Fixture_{post}$ / 1000 W/kW

CF	Peak Demand Coincident Factor, % Time During the Peak Period in Which Lighting is Operating
IEF_D	Heating/Cooling Demand Interactive Effects Factor

Lighting Retrofit kWh Savings Calculations

Measure	Quantity (Fixtures)		Wattage		AOH	Expected kWh Savings	Realized kWh Savings	IEF_E	Realization Rate
	Base	Post	Base	Post					
T-8 Fluorescent to 23 W LED Fixture	115	115	112	23	5,740	106,576	69,828	1.09	65.5%
T-8 Fluorescent to 23 W LED Fixture	206	206	58	23	5,740	50,453	55,485	1.09	110%
T-8 Fluorescent to 23 W LED Fixture	20	20	85	23	5,740	13,377	8,766	1.09	65.5%
T-8 Fluorescent to 31 W LED Fixture	242	242	58	31	5,740	88,962	57,309	1.09	64.4%
T-8 Fluorescent to 31 W LED Fixture	23	23	58	31	5,740	8,455	5,447	1.09	64.4%
T-8 Fluorescent to 44 W LED Fixture	55	55	58	44	5,740	6,302	10,117	1.09	161%
T-8 Fluorescent to 44 W LED Fixture	43	43	112	44	5,740	34,243	22,437	1.09	65.5%
U-Tube Fluorescent to 16 W LED Fixture	4	4	59	16	5,740	1,856	1,216	1.09	65.5%
Halogen Lamp to 20 W LED Screw	15	15	90	20	5,740	10,026	6,569	1.09	65.5%
Metal Halide to 185 W LED Fixture	6	6	453	185	5,740	19,063	12,491	1.09	65.5%
T-8 Fluorescent to 44 W LED Fixture	2	2	362	185	5,740	2,543	3,025	1.09	119%
T-8 Fluorescent to 20 W LED Screw	10	5	58	10	5,740	5,061	3,425	1.09	67.7%
Total						**346,917**	**256,116**	**1.09**	**73.8%**

Lighting Retrofit kW Savings Calculations

Measure	Quantity (Fixtures)		Wattage		CF	Expected kW Savings	Realized kW Savings	IEF_D	Realization Rate
	Base	Post	Base	Post					
T-8 Fluorescent to 23 W LED Fixture	115	115	112	23	1.00	8.97	10.08	1.20	89.4%
T-8 Fluorescent to 23 W LED Fixture	206	206	58	23	1.00	2.25	8.31	1.20	200%
T-8 Fluorescent to 23 W LED Fixture	20	20	85	23	1.00	1.09	1.28	1.20	900%
T-8 Fluorescent to 31 W LED Fixture	242	242	58	31	1.00	5.94	8.87	1.20	80.0%
T-8 Fluorescent to 31 W LED Fixture	23	23	58	31	1.00	0.56	0.84	1.20	213%
T-8 Fluorescent to 44 W LED Fixture	55	55	58	44	1.00	0.24	1.69	1.20	10.1%
T-8 Fluorescent to 44 W LED Fixture	43	43	112	44	1.00	2.56	3.36	1.20	234%
U-Tube Fluorescent to 16 W LED Fixture	4	4	59	16	1.00	0.15	0.18	1.20	100%
Halogen Lamp to 20 W LED Screw	15	15	90	20	1.00	0.92	0.92	1.20	99.8%
Metal Halide to 185 W LED Fixture	6	6	453	185	1.00	1.41	1.87	1.20	481%
T-8 Fluorescent to 44 W LED Fixture	2	2	362	185	1.00	0.11	0.47	1.20	75.0%
T-8 Fluorescent to 20 W LED Screw	10	5	58	10	1.00	0.46	0.49	1.20	80.0%
Total						**24.66**	**38.35**	**1.20**	**155.5%**

Results

Project CIP_711 has a realization rate of 74% for kWh and 156% for kW. The ex-ante savings estimate was based on an AOH of 8,760 hours for their facility rather than the 5,740 hours associated with manufacturing sites, leading to the discrepancy in kWh.

Verified Gross Savings & Realization Rates

Verified			
kWh Savings	kW Savings	kWh Realization Rate	kW Realization Rate
346,917	256,116	74%	156%

Project Number CIP_712
Program Small Commercial &Industrial Solutions

Project Background
The participant is a religious facility that received incentives from Entergy New Orleans for retrofitting energy efficient lighting. The Evaluators verified that the following had been installed:

- (10) 3W LED candelabra lamps replacing (10) 40W Halogen lamps
- (103) 9W LED lamps replacing (103) 43W Halogen lamps
- (23) 10W LED lamps replacing (23) 65W Halogen lamps
- (2) 30W 2' 2L fixtures replacing (2) 2' 2L linear fluorescent fixtures
- (2) 4' 12W LED lamps replacing (2) 4' linear fluorescent lamps
- (65) 4' 2L 24W LED fixtures replacing (65) 4' 2L linear fluorescent fixtures
- (65) 4' 4L 48W LED fixtures replacing (65) 4' 4L linear fluorescent fixtures
- (21) 4' 4L LED retrofit kit replacing (21) 4' 4L linear fluorescent fixtures
- (24) 10W LED lamps replacing (24) 65W halogen lamps
- (6) 25W LED lamps replacing (6) 26W compact fluorescent lamps
- (50) 15W PAR38 LED lamps replacing (50) 72W halogen lamps

Two line items were claimed but not completely accounted for in the invoice document:

- (1) 16W LED lamp replacing (1) 100W halogen lamp. This measure was not found on the invoice
- (1) 8' belly pan retrofit kit consisting of (4) 4L lamps replacing (2) 8' 2L linear fluorescent fixtures. This was included in the invoice; however, it didn't include lamps and the lamps in the invoice were already accounted for.

Calculation Parameters
The Evaluators confirmed installation of all but two fixtures listed in the project application. Savings for the measures were calculated using prescriptive savings values listed in Section D.6 of the NO TRM V6.1. The specific values used in calculating savings for this site are presented in the table below. Religious facility was the space type used to determine the appropriate TRM deemed values.
Table A. Prescriptive Savings Parameters

Facility or Space Type	AOH	CF	IEF_E	IEF_D
Religious Gathering	3,174	0.53	0.87	1.2

Savings Calculations
Using values from the table above, the Evaluators calculated lighting savings as follows:

Table B. Lighting Retrofit kWh Savings Calculations

Prescriptive Measure	Measure Quantity	Expected kWh Savings	Realized kWh Savings	kWh Realization Rate
H40/1 to LED003-SCRW	10	1,357	1,022	75%
H43/1 to LED009-SCRW	103	14,405	9,670	67%
H65/1 to LED010-SCRW	23	5,203	3493	67%
F22ILL to LED030-FIXT	2	107	17	16%
F82ILL to LED080-FIXT	1	123	0	0%

F41ILL to LED012-FIXT	2	148	105	71%
F42ILL to LED024-FIXT	65	8,556	6,103	71%
F44ILL to LED048-FIXT	65	16,042	11,487	72%
F44ILL to LED025-FIXT	21	7,515	5,045	67%
H65/1 to LED010-SCRW	24	5,430	3645	67%
CFM26/1-L to LED025-SCRW	6	99	66	67%
H72/1 to LED015-SCRW	50	11,723	7,870	67%
H100/1 to LED016-SCRW	1	346	Unverified	0%
Total	**373**	**71,054**	**48,523**	**68.3%**

Table C. Lighting Retrofit kW Reduction Calculations

Prescriptive Measure	Measure Quantity	Expected kW Savings	Realized kW Savings	kW Realization Rate
H40/1 to LED003-SCRW	10	0.3	0.24	80%
H43/1 to LED009-SCRW	103	3.24	2.23	69%
H65/1 to LED010-SCRW	23	1.17	0.8	68%
F22ILL to LED030-FIXT	2	0.02	0	0%
F82ILL to LED080-FIXT	1	0.03	0	0%
F41ILL to LED012-FIXT	2	0.03	0.02	67%
F42ILL to LED024-FIXT	65	1.92	1.41	73%
F44ILL to LED048-FIXT	65	3.6	2.65	74%
F44ILL to LED025-FIXT	21	1.69	1.16	69%
H65/1 to LED010-SCRW	24	1.22	0.84	69%
CFM26/1-L to LED025-SCRW	6	0.02	0.02	100%
H72/1 to LED015-SCRW	50	2.63	1.81	69%
H100/1 to LED016-SCRW	1	0.08	Unverified	0%
Total	373	15.95	11.18	70.1%

Results

The kWh and kW reduction realization rates for project CIP-712 are 68.3% and 70.1%, respectively. The realization rate is due to different fixture wattages and different assumed facility types.

The ex-ante analysis used slightly different wattages on some of the new LED fixtures. The evaluator used the wattage from the spec sheets and the invoice for the new LEDs and used the baseline lamp/fixture type from the ex-ante analysis to estimate the baseline wattage. In addition, two fixtures were unable to be verified using the invoice and post pictures provided.

The ex-ante used TRM prescriptive deemed numbers associated with “Attached Office” which were 4,728 annual hours of use and 0.77 peak demand coincidence factor. The evaluator used prescriptive numbers for “Religious Gathering” which were 3,577 hours of use and 0.53 peak demand coincidence factor, reducing the realization rates.

Table D. Verified Gross Savings & Realization Rates

Measure	Verified			
	kWh Savings	kW Savings	kWh Realization Rate	kW Realization Rate
LED Lighting Retrofits	48,523	15.96	68.3%	70%

Project Number CIP_716
Program Small Commercial & Industrial Solutions

Project Background

The participant is a fast-food service facility that received incentives from Entergy New Orleans for retrofitting evaporator fan controllers for facility freezers. The Evaluators verified that the following had been installed:

- (1) Motor Controlled Evaporator Fan and Refr. Energy Management system

Calculation Parameters

The Evaluators conducted a desk review of the project and determined that the project comprised of a deemed evaporator fan controller installation. Saving calculations were performed using the savings methodology described in the Evaporator Fan Controls Section of the NO TRM V6.1. Deemed savings parameters applicable to this site are shown below:

Table A. Evaporator Fan Controller Savings Parameters

Qty	Circulation Fan (kW)	Fan (kW)	Compressor Duty Cycle	Evaporator Duty Cycle	Bonus Factor
1	0.035	0.123	50%	94%	1.2

Savings Calculations

Using the values from Table A above, the Evaluators calculated evaporator control savings as follows:

Table B. Evaporator Fan Controller kWh Savings Calculations

Measure	Quantity	Expected kWh Savings	Realized kWh Savings	Realization Rate
Evaporator Fan Controls	1	1,507	507	33%
Total		**1,507**	**507**	**33%**

Table C. Evaporator Fan Controller kWh Savings Calculations

Measure	Quantity	Expected kW Savings	Realized kW Savings	Realization Rate
Evaporator Fan Controls	1	0.17	0.06	33%
Total		**0.17**	**0.06**	**33%**

Results

The kWh and kW realization rates for project CIP_716 are 33% and 33%, respectively.
Discrepancies in the kWh and kW realization rate due to only one of the three claimed controls were installed, which resulted in lower realization rates.

Table D. Verified Gross Savings & Realization Rates

Measure	Verified			
	kWh Savings	kW Savings	kWh Realization Rate	kW Realization Rate
Evaporator Fan Controls	1,507	0.06	33%	33%
Total	**1,507**	**0.06**	**33%**	**33%**

Project Number CIP_719
Program Small Commercial & Industrial Solutions

Project Background

The participant is a school that received incentives from Entergy New Orleans for retrofitting energy efficient lighting. The Evaluators verified that the following had been installed:

- (775) 10.5W 4-foot T8 LED lamps replacing (775) 31W Linear Fluorescent lamps.
- (24) 24W 4-foot T8 LED lamps replacing (24) 64W Linear Fluorescent lamps.

Calculation Parameters

The Evaluators confirmed installation of all fixtures listed in the project application. Savings for the measures were calculated using prescriptive savings values listed in Section D.6 of the NO TRM V6.1. The specific values used in calculating savings for this site are presented in the table below. Although the facility is primarily for K-12 students, the hours are unconventional and more closely resemble university hours.

Table A. Prescriptive Savings Parameters

Facility or Space Type	AOH	CF	IEF_E	IEF_D
Education: University	3,577	0.69	1.09	1.2

Savings Calculations

Using values from the table above, the Evaluators calculated lighting savings as follows:

Table B. Lighting Retrofit kWh Savings Calculations

Prescriptive Measure	Measure Quantity	Expected kWh Savings	Realized kWh Savings	kWh Realization Rate
F41ILL to LED010.5-FIXT	775	42,373	61,944	146.2%
F41GPHL-H to LED024-FIXT	24	1,830	3,743	204.5%
Total	799	44,203	65,687	148.6%

Table C. Lighting Retrofit kW Reduction Calculations

Prescriptive Measure	Measure Quantity	Expected kW Savings	Realized kW Savings	kW Realization Rate
F41ILL to LED010.5-FIXT	775	9.71	13.15	135.4%
F41GPHL-H to LED024-FIXT	24	0.41	0.80	188.1%
Total	799	10.12	13.95	137.8%

Results

The kWh and kW reduction realization rates for project CIP-719 are 149% and 138%, respectively. The realization rate is due to different fixture wattages and different hours of use.

The *ex ante* analysis used lower baseline wattages and higher post wattages which increased the realization rate. The evaluator used the wattage from the spec sheets for the new LEDs and used the baseline lamp/fixture type from the ex-ante analysis to estimate the baseline wattage.

The *ex ante* also used 4,235.6 annual hours of use while the evaluator used prescriptive hours for Education: College/University, 3,577 hours.

Table D. Verified Gross Savings & Realization Rates

Measure	Verified			
	kWh Savings	kW Savings	kWh Realization Rate	kW Realization Rate
LED Lighting Retrofits	65,687	13.95	149%	138%

Project Number CIP_722
Program Small Commercial & Industrial Solutions

Project Background

The participant is an office that received incentives from ENO for implementing energy efficient lighting. The implementers verified that the participant had installed:

- 5) 6 W Exit Lights replacing (5) Halogen Lamps;
- (82) 16 W Screw Based LED Fixtures replacing (82) Compact Fluorescent fixtures;
- (160) 12 W Screw Based LED Fixtures replacing (160) Compact Fluorescent fixtures;
- (31) 12 W Screw Based LED Fixtures replacing (31) Halogen Lamps;
- (3) 200 W LED Fixtures replacing (3) Metal Halide fixtures;
- (2) 20 W LED Fixtures replacing (2) Metal Halide fixtures;
- (2) 55 W LED Fixtures replacing (2) Metal Halide fixtures;
- (46) 25 W LED Fixtures replacing (46) T8 Fluorescent fixtures;
- (204) 18 W LED Fixtures replacing (204) T8 Fluorescent fixtures;
- (10) 38 W LED Screw-Based Fixtures replacing (10) Halogen Lamps;

M&V Methodology

The evaluators found that the lighting wattages deviated from those listed in the project application. Verified DLC wattages were used in ex post savings calculations. The provided project calculator had different expected savings than the tracking data reported. Savings for the lighting measures were calculated using Louisiana stipulated deemed values by space type for hours of use, along with a stipulated peak Coincident Factor (CF), Interactive effects factor for energy (IEF_E) and Interactive effects factor for demand (IEF_D) determined using local weather data and ENO peak parameters. The deemed values used in calculating savings are presented in the table below.

Deemed Savings Parameters

Building Type	Heating Type	Annual Hours	IEF_E	IEF_D	CF
Religious Gathering	Resistance	3,174	0.87	1.20	0.53
Exterior	None	4,319	1.00	1.00	0

Savings Calculations

Using deemed values from the table above, the evaluators calculated lighting savings as follows:

$$\text{Annual kWh Savings} = \left(\text{kW}_{\text{base}} * \text{AOH}_{\text{base}} - \text{kW}_{\text{post}} * \text{AOH}_{\text{post}}\right) * \text{IEF}_{\text{E}}$$

Parameters for kWh Savings Calculation of Lighting Retrofit Measures

kW_{base}	Total Baseline fixtures x $W/Fixture_{base}$ / 1000 W/kW
kWpost	Total Installed fixtures x $W/Fixture_{post}$ / 1000 W/kW
AOH_{base}	Annual Operating Hours of Baseline Fixtures
AOH_{post}	Annual Operating Hours of Installed Fixtures
IEF_E	Heating/Cooling Energy Interactive Effects Factor

Following this, the evaluators calculated peak kW savings. This is based upon Louisiana defined peak hours during summer weekdays. Peak kW savings are calculated as:

$$\text{Peak kW Savings} = \left(\text{kW}_{\text{base}} - \text{kW}_{\text{post}}\right) * \text{CF} * \text{IEF}_{\text{D}}$$

Parameters for Peak Demand (kW) Savings Calculation of Lighting Retrofit Measures

kW_{base}	Total Baseline fixtures x $W/Fixture_{base}$ / 1000 W/kW
kW_{post}	Total Installed fixtures x $W/Fixture_{post}$ / 1000 W/kW
CF	Peak Demand Coincident Factor, % Time During the Peak Period in Which Lighting is Operating
IEF_D	Heating/Cooling Demand Interactive Effects Factor

Lighting Retrofit kWh Savings Calculations

Measure	Quantity (Fixtures)		Wattage		AOH	Expected kWh Savings	Realized kWh Savings	IEF_E	Realization Rate
	Base	Post	Base	Post					
Halogen Lamp to Exit Light	4	4	40	6	3,174	2,378	376	0.87	15.8%
Compact Fluorescent to 16 W LED Screw	8	8	18	16	3,174	135	44	0.87	32.7%
Halogen Lamp to 16 W LED Screw	38	38	65	16	3,174	7,068	5,142	0.87	72.7%
Halogen Lamp to 16 W LED Screw	3	3	75	16	3,174	671	489	0.87	72.9%
Halogen Lamp to 16 W LED Screw	26	26	40	16	3,174	2,367	1,723	0.87	72.8%
Compact Fluorescent to 12 W LED Screw	6	6	13	12	3,174	68	17	0.87	24.5%
Compact Fluorescent to 12 W LED Screw	154	154	18	12	3,174	4,682	2,552	0.87	54.5%
Halogen Lamp to 12 W LED Screw	8	8	60	12	3,174	1,443	1,060	0.87	73.5%
Halogen Lamp to 12 W LED Screw	6	6	60	12	4,319	1,244	1,244	1.00	100.0%
Halogen Lamp to 12 W LED Screw	17	17	75	12	3,174	4,024	2,957	0.87	73.5%
T-8 Fluorescent to 200 W LED Fixture	3	3	183	200	3,174	(192)	(141)	0.87	73.5%
Compact Fluorescent to 400 W LED Fixture	2	2	78	20	4,319	501	501	1.00	100.0%
T-8 Fluorescent to 20 W LED Fixture	2	2	183	55	4,319	1,106	1,106	1.00	100.0%
T-8 Fluorescent to 25 W LED Fixture	10	10	80	25	3,174	5,073	1,519	0.87	29.9%
T-8 Fluorescent to 25 W LED Fixture	36	36	164	25	3,174	85,356	13,818	0.87	16.2%
T-8 Fluorescent to 18 W LED Fixture	8	8	80	18	3,174	4,058	1,370	0.87	33.8%
T-8 Fluorescent to 18 W LED Fixture	130	130	31	18	3,174	6,621	4,667	0.87	70.5%
T-8 Fluorescent to 18 W LED Fixture	66	66	42	18	3,174	5,456	4,374	0.87	80.2%
Halogen Lamp to 38 W LED Screw	10	10	90	38	3,174	1,973	1,436	0.87	72.8%
Compact Fluorescent to 16 W LED Screw	7	7	36	16	3,174	1,473	387	0.87	26.2%
Total						**135,504**	**44,639**	**0.87**	**32.9%**

Lighting Retrofit kW Savings Calculations

Measure	Quantity (Fixtures)		Wattage		CF	Expected kW Savings	Realized kW Savings	IEF_D
	Base	Post	Base	Post				
Halogen Lamp to Exit Light	4	4	40	6	0.53	0.00	0.09	1.20
Compact Fluorescent to 16 W LED Screw	8	8	18	16	0.53	0.00	0.01	1.20
Halogen Lamp to 16 W LED Screw	38	38	65	16	0.53	0.00	1.18	1.20
Halogen Lamp to 16 W LED Screw	3	3	75	16	0.53	0.00	0.11	1.20
Halogen Lamp to 16 W LED Screw	26	26	40	16	0.53	0.00	0.40	1.20
Compact Fluorescent to 12 W LED Screw	6	6	13	12	0.53	0.00	0.00	1.20
Compact Fluorescent to 12 W LED Screw	154	154	18	12	0.53	0.00	0.59	1.20
Halogen Lamp to 12 W LED Screw	8	8	60	12	0.53	0.00	0.24	1.20

Halogen Lamp to 12 W LED Screw	6	6	60	12	0	0.00	0.00	1.00
Halogen Lamp to 12 W LED Screw	17	17	75	12	0.53	0.00	0.68	1.20
T-8 Fluorescent to 200 W LED Fixture	3	3	183	200	0.53	0.00	-0.03	1.20
Compact Fluorescent to 400 W LED Fixture	2	2	78	20	0	0.00	0.00	1.00
T-8 Fluorescent to 20 W LED Fixture	2	2	183	55	0	0.00	0.00	1.00
T-8 Fluorescent to 25 W LED Fixture	10	10	80	25	0.53	0.00	0.35	1.20
T-8 Fluorescent to 25 W LED Fixture	36	36	164	25	0.53	0.00	3.18	1.20
T-8 Fluorescent to 18 W LED Fixture	8	8	80	18	0.53	0.00	0.32	1.20
T-8 Fluorescent to 18 W LED Fixture	130	130	31	18	0.53	0.00	1.07	1.20
T-8 Fluorescent to 18 W LED Fixture	66	66	42	18	0.53	0.00	1.01	1.20
Halogen Lamp to 38 W LED Screw	10	10	90	38	0.53	0.00	0.33	1.20
Compact Fluorescent to 16 W LED Screw	7	7	36	16	0.53	0.00	0.09	1.20
Total						**0.00**	**9.62**	**1.20**

Results

Project CIP_722 has a realization rate of 33% for kWh and 0% for kW. The realization rate discrepancy is due to the ex-ante savings estimate using exterior hours and CF for all fixtures where the ex post analysis used the most appropriate facility types.

Verified Gross Savings & Realization Rates

Measure	Verified			
	kWh Savings	kW Savings	kWh Realization Rate	kW Realization Rate
Total Savings	44,639	9.62	33%	-

Project Number CIP_728
Program Publicly Funded Institutions

Project Background

The participant is an office facility that received incentives from Entergy New Orleans for retrofitting energy efficient lighting. The Evaluators verified that the following had been installed:

- (21) 9W LED Fixtures replacing (21) Compact Fluorescent Screw-in Lamps
- (72) 12W LED Fixture replacing (147) Compact Fluorescent Screw-in Lamps
- (6) 13W LED Fixtures replacing (6) Compact Fluorescent Screw-in Lamps
- (26) 19W LED Fixtures replacing (26) Compact Fluorescent Screw-in Lamps
- (105) 16W LED Fixtures replacing (139) Compact Fluorescent Screw-in Lamps
- (65) 22W LED Fixtures replacing (106) Compact Fluorescent Screw-in Lamps
- (6) 25W LED Fixtures replacing (12) Compact Fluorescent Screw-in Lamps
- (65) 33W LED Fixtures replacing (130) Compact Fluorescent Screw-in Lamps
- (65) 7W LED Fixtures replacing (158) Compact Fluorescent Screw-in Lamps
- (12) 10W LED Fixtures replacing (12) Compact Fluorescent Screw-in Lamps
- (1) 7W LED Fixture replacing (2) Fluorescent T-5 Lamps
- (1,299) 7W LED Fixtures replacing (1,303) Fluorescent T-8 Lamps
- (250) 10W LED Fixtures replacing (322) Fluorescent T-8 Lamps
- (1) 54W Fixture replacing (1) Fluorescent T-8 Lamps
- (4,467) 11W LED Fixtures replacing (4,575) Fluorescent T-8 Lamps
- (1,042) 9W LED Fixtures replacing (1,028) Fluorescent T-8 Lamps
- (1) 11W LED Fixtures replacing (1) Fluorescent STD Lamps
- (2) 12W LED Fixtures replacing (2) Halogen Lamps
- (38) 13W LED Fixtures replacing (38) Halogen Lamps
- (11) 22W LED Fixtures replacing (11) Halogen Lamps
- (3) 15W LED Exterior Fixtures replacing (3) High Pressure Sodium Lamps (exterior)
- (1) 16W LED Fixtures replacing (3) Halogen Lamps
- (30) 22W LED Fixtures replacing (30) Metal Halide Lamps
- (8) 52W LED Exterior Fixtures replacing (8) Metal Halide Lamps
- (4) 38W LED Fixtures replacing (6) Metal Halide Lamps
- (1) 145W LED Exterior Fixtures replacing (1) Metal Halide Lamps
- (280) 16W LED Fixtures replacing (280) Metal Halide Lamps
- (12) 7W LED Fixtures replacing (12) Fluorescent U-Tube, T-8 Lamps

Calculation Parameters

The Evaluators conducted a desk review of the project and determined that the project comprised of a prescriptive lighting installation. Saving calculations were performed using the savings methodology described in section D.6.3 Commercial Lighting Efficiency of the NO TRM V6.1. Deemed savings parameters applicable to this site are shown below:

Table A. Savings Parameters

Building Type	Heating Type	Annual Hours	IEF_E	IEF_D	CF
Office	Gas	5,159	1.09	1.2	0.77
Exterior	Gas	4,319	1.00	1.0	0.00

Savings Calculations

Using the values from Table A above, the Evaluators calculated lighting savings as follows:

Table B. Lighting Retrofit kWh Savings Calculations

Measure	Quantity (Fixtures)		Wattage		Annual Operating Hours
	Base	Post	Base	Post	
Compact Fluorescent Screw-in Lamp to 9W LED	21	21	27	9	5,159
Compact Fluorescent Screw-in Lamp to 12W LED	147	72	22	12	5,159
Compact Fluorescent Screw-in Lamp to 13W LED	6	6	22	13	5,159
Compact Fluorescent Screw-in Lamp to 19W LED	26	26	38	19	5,159
Compact Fluorescent Screw-in Lamp to 16W LED	139	105	33	16	5,159
Compact Fluorescent Screw-in Lamp to 22W LED	106	65	45	22	5,159
Compact Fluorescent Screw-in Lamp to 25W LED	12	6	38	25	5,159
Compact Fluorescent Screw-in Lamp to 33W LED	130	65	50	33	5,159
Compact Fluorescent Screw-in Lamp to 7W LED	158	65	43	7	5,159
Compact Fluorescent Screw-in Lamp to 10W LED	12	12	46	10	5,159
Fluorescent T-5 Lamp to 7W LED	2	1	18	7	5,159
Fluorescent T-8 Lamp to 7W LED	1,303	1,299	40	7	5,159
Fluorescent T-8 Lamp to 10W LED	322	250	24	10	5,159
Fluorescent T-8 Lamp to 54W LED	1	1	30	54	5,159
Fluorescent T-8 Lamp to 11W LED	4,575	4,467	47	11	5,159
Fluorescent T-8 Lamp to 9W LED	1,028	1,042	113	9	5,159
Fluorescent STD Lamp to 11W LED	1	1	150	11	5,159
Halogen Lamp to 12W LED	2	2	50	12	5,159
Halogen Lamp to 13W LED	38	38	88	13	5,159
Halogen Lamp to 22W LED	11	11	90	22	5,159
HPS Lamp to 15W LED	3	3	138	15	4,319
Halogen Lamp to 16W LED	3	1	60	16	5,159
Metal Halide to 22W LED	30	30	148	22	5,159
Metal Halide to 52W LED	8	8	148	52	4,319
Metal Halide to 38W LED	6	4	228	38	5,159
Metal Halide to 145W LED	1	1	499	145	4,319
Metal Halide to 16W LED	280	280	124	16	5,159
Fluorescent U-Tube, T-8 Lamp to 7W LED	12	12	54	7	5,159

Results

The kWh and kW realization rates for project CIP_728 are 123% and 179%, respectively.

Discrepancies in the kWh and kW realization rate were due to the evaluators verifying different post fixture wattages and also the ex ante analysis applying a correction factor to the savings estimate that did not align with the TRM methodology.

Table G. Verified Gross Savings & Realization Rates

Measure	Verified			
	kWh Savings	kW Savings	kWh Realization Rate	kW Realization Rate
New Construction Lighting	1,542,856	233	123%	179%
Total	**1,542,856**	**233**	**123%**	**179%**

Project Number CIP_734

Program Commercial & Industrial Construction Solutions

Project Background

This facility is a distillery that has added insulation, heat pumps, and a cool roof as part of a new construction project. The kWh realization rate for this project is 13% and the Peak kW realization rate is 23%.

This project consisted of the following installations:

- Insulation
- (2) heat pumps
- cool roof

Measurement and Verification Effort

The Evaluators performed a desk review to verify the installation of the insulation, heat pumps, and cool roof. During the desk review the space type was verified to be accurate versus the ex-ante expectations. The M&V effort for this project follows the guidelines of the 2012 International Performance Measurement and Verification Protocol (IPMVP) Option A – Retrofit Isolation (Key Parameter Measurement). The desk review of this project relied on methodologies from the New Orleans TRM v6.1 for the heat pump and cool roof measures, and a custom analysis for the insulation measure:

Insulation

$$\mathrm{kWh_{Cool}} = \frac{\mathrm{Area} \times \mathrm{Cv} \times \mathrm{CDD} \times \left(\frac{1}{\mathrm{R_{Base}}} - \frac{1}{\mathrm{R_{Eff}}}\right)}{\mathrm{Eff_{HVAC,\,Cool}} \times 1000}$$

$$\mathrm{kWh_{Heat}} = \frac{\mathrm{Area} \times \mathrm{Cv} \times \mathrm{HDD} \times \left(\frac{1}{\mathrm{R_{Base}}} - \frac{1}{\mathrm{R_{Eff}}}\right)}{\mathrm{Eff_{HVAC,Heat}} \times 1000}$$

$$\mathrm{kW} = \frac{\mathrm{kWh_{Cool}}}{\mathrm{EFLH_{Cool}}} \times \mathrm{CF}$$

Where:

Area = Surface area being insulated (sq.ft.)
Cv = Conversion factor (24, hrs/day)
CF = Coincidence Factor (pulled from Heat Pump measure)
CDD = Cooling Degree Days per year (65F balance point)
HDD = Heating Degree Days per year (65F balance point)
$EFLH_{Cool}$ = Effective Full Load Hours for cooling (pulled from Heat Pump measure)
R_{Base} = Baseline insulation R-Value (ft^2-F-hr/BTU)
R_{Eff} = Efficient insulation R-Value (ft^2-F-hr/BTU)
Eff_{HVAC} = Efficiency of HVAC system (SEER2 or HSPF2) (BTU/Wh)
$_{Cool}$ = Denotes cooling equipment or Heat Pump cooling mode
$_{Heat}$ = Denotes heating equipment or Heat Pump heating mode

The tables below detail the inputs to the calculations for annual kWh savings and peak kW reductions based on deemed TRM values and a combination of site visit details and initial application.

Insulation Annual kWh Savings

Location	Area	Baseline R-Value	Installed R-Value	CDD	HDD	SEER2	HSPF2	Expected kWh Savings	Realized kWh Savings	RR
Roof	2,400	19	19.4	3,047	1,343	22.8	9.3	26,569	17	0%
Walls	1,180	13	13.6					12,760	27	0%
							Total	39,329	44	0%

Heat Pump Annual kWh Savings

Unit	Capacity BTU/hr	SEER2	HSPF	SEER2	HSPF2	$EFLH_C$	$EFLH_H$	Expected kWh Savings	Realized kWh Savings	RR
HP 1	18,000	14.3	7.5	20.5	8.9	3,191	513	897	1,408	157%
HP 2	36,000			23.9	9.5			1,785	3,745	209%
							Total	2,692	5,154	191%

Cool Roof Annual kWh Savings

Measure	Area (sq.ft.)	Expected kWh Savings	Realized kWh Savings	RR
Cool Roof	2,400	235	235	100%
Total		235	235	100%

Results

Verified Gross Savings/Realization Rates

SUMMARY			
Metric	**Expected**	**Measured**	**Realization Rate:**
Coincident Peak kW:	4.46	1.02	23%
Annual kWh:	42,256	5,432	13%

The Annual kWh realization rate for this project is 13% and the peak kW realization rate is 23%. Discrepancies in kWh savings for the Insulation measure are a result of the following:

- Different CDD and HDD calculations
- Implementer failed to use code requirements for their baseline insulation levels, which is necessary for new construction projects.

Project Number CIP_738
Program Large Commercial & Industrial Solutions

Project Background

The participant is an exterior parking garage that received incentives from Entergy New Orleans for retrofitting energy efficient lighting. The Evaluators verified that the following had been installed:

- (13) 48W LED Fixture replacing (13) T8 Fluorescent Lamps
- (15) 88W Screw-Based LED Fixture replacing (15) T8 Fluorescent Lamps

Calculation Parameters

The Evaluators conducted a site visit for this project and determined that the project comprised of a prescriptive lighting installation. Saving calculations were performed using the savings methodology described in the Commercial Lighting Efficiency Section of the NO TRM V6.1. Deemed savings parameters applicable to this site are shown below:

Table A. Prescriptive Savings Parameters

Building Type	Heating Type	Annual Hours	IEF_E	IEF_D	CF
Parking Structure	None	7,884	1.00	1.00	1.00

As this facility installed their fixtures in an exterior location, kW savings are not applicable.

Savings Calculations

Using the values from Table A above, the Evaluators calculated lighting savings as follows:

Table B. Prescriptive Lighting Retrofit kWh Savings Calculations

Measure	Quantity (Fixtures)		Wattage		Annual Operating Hours	Expected kWh Savings	Realized kWh Savings	IEF_E	Realization Rate
	Pre	Post	PRe	Post					
T8 Fluorescent to 48W LED	13	13	58	48	7,884	1,136	1,025	1.00	90%
T8 Fluorescent to 88W LED	15	15	110	88	7,884	2,883	2,602	1.00	90%
					Total	**4,019**	**3,627**		**90%**

Results

The kWh realization rate for project CIP_738 is 90%.
Discrepancies in the kWh realization rate was due to a difference in AOH used in the analysis.

Table G. Verified Gross Savings & Realization Rates

Measure	Verified			
	kWh Savings	kW Savings	kWh Realization Rate	kW Realization Rate
T8 Fluorescent to 48W LED	1,025	N/A	90%	N/A
T8 Fluorescent to 88W LED	2,602	N/A	90%	N/A
Total	**3,627**	**N/A**	**90%**	**N/A**

Project Number CIP_755
Program Large Commercial & Industrial Solutions

Project Background

The participant is an office that received incentives from Entergy New Orleans for implementing a retrofit on their HVAC systems. The implementers verified that the participant had installed:

- (1) Air Handling Units VFD

M&V Methodology

The Evaluators confirmed installation of all units listed in the project application. The specifications of the equipment installed at this site are presented in the table below.

Savings Parameters

Equipment	Quantity	Building Type	VFD Horsepower	Deemed Energy (kWh/HP)	Deemed Demand (kW/HP)
ACH580-VCR-023A-4+F267	1	Office	15	619	0.073

Savings Calculations

The Evaluators performed a desk review of the project. Below are the findings of THE EVALUATORS's desk review.

Thermostat kWh Savings Calculations.

Measure Type	Measure Quantity	Expected kWh Savings	Realized kWh Savings	kWh Realization Rate
VSD	1	15,961	9,285	58.2%
Total	**1**	**15,961**	**9,285**	**58.2%**

Thermostat kW Savings Calculations.

Measure Type	Measure Quantity	Expected kW Savings	Realized kW Savings
VSD	1	0	1.095
Total	**1**	0	1.095

Results

Project CIP_755 has a realization rate of 58% for kWh and none for kW. The realization rate is off due to the ex-ante using an average of deemed values and the ex-post uses facility specific information.

Verified Gross Savings & Realization Rates

Measure	Verified			
	kWh Savings	kW Savings	kWh Realization Rate	kW Realization Rate
Total Savings	**9,285**	**1.095**	**58.2%**	**N/A**

Project Number CIP_777
Program Large Commercial & Industrial Solutions

Project Background

This facility is an office building that has added (12) Fan Control Units (FCUs) to (12) VAV boxes with electric resistance heaters and a building Energy Management System (EMS). The VAV box heaters are currently running at full capacity during all operating hours. The kWh realization rate for this project is 76%. This project consisted of the following installations:

- (12) FCUs
- (1) EMS

Measurement and Verification Effort

The Evaluators performed a desk review to verify the installation of the FCUs and EMS. The M&V effort for this project follows the guidelines of the 2021 International Performance Measurement and Verification Protocol (IPMVP) Option A – Retrofit Isolation (Key Parameter Measurement). The desk review of this project relied on methodologies used by the implementer:

$$\mathrm{kWh_{savings}} = \mathrm{kWh_{pre}} - \mathrm{kWh_{post}}$$
$$\mathrm{kWh_{pre}} = \mathrm{kW_{heaters}} \times \mathrm{AOH} \times 0.75$$
$$\mathrm{kWh_{post}} = \mathrm{kW_{heaters}} \times \mathrm{Heating\ Hours}$$
$$\mathrm{Heating\ Hours} = \frac{\mathrm{HDD}}{\mathrm{CDD} + \mathrm{HDD}} \times \mathrm{AOH}$$

Where
AOH = Annual Operating Hours
$kW_{heaters}$ = Total kW rating of all VAV boxes with heaters
Heating Hours = Total hours that VAV box heaters spend in heating mode per year
HDD = TMY3 Heating Degree Days (65F)
CDD = TMY3 Cooling Degree Days (65F)

The tables below detail the inputs to the calculations for annual kWh savings and peak kW reductions based on deemed TRM values and a combination of site visit details and initial application.

Insulation Annual kWh Savings

Measure	$kW_{heaters}$	AOH	CDD (65F)	HDD (65F)	Expected kWh Savings	Realized kWh Savings	RR
FCUs & EMS	44.0	4,004	2,890	1,509	94,732	71,686	76%
Total					**94,732**	**71,686**	**76%**

Results

Verified Gross Savings/Realization Rates

Metric	Expected	Measured	Realization Rate:
Annual kWh:	94,732	71,686	76%

The Annual kWh realization rate for this project is 76%.

Discrepancies in kWh savings are a result of a difference in calculated CDD and HDD totals, with HDDs taking up a greater portion of total Degree Days in the analysis, resulting in greater Heating Hours and lower savings.

Project Number CIP_778
Program Large Commercial & Industrial Solutions

Project Background

This facility is an office building that has added (5) Fan Control Units (FCUs) to (5) VAV boxes with electric resistance heaters and a building Energy Management System (EMS). The VAV box heaters are currently running at full capacity during all operating hours. The kWh realization rate for this project is 66%. This project consisted of the following installations:

- (5) FCUs
- (1) EMS

Measurement and Verification Effort

THE EVALUATORS performed a desk review to verify the installation of the FCUs and EMS. The M&V effort for this project follows the guidelines of the 2022 International Performance Measurement and Verification Protocol (IPMVP) Option A – Retrofit Isolation (Key Parameter Measurement). The desk review of this project relied on methodologies used by the implementer:

$$\mathrm{kWh_{savings}} = \mathrm{kWh_{pre}} - \mathrm{kWh_{post}}$$
$$\mathrm{kWh_{pre}} = \mathrm{kW_{heaters}} \times \mathrm{AOH} \times 0.75$$
$$\mathrm{kWh_{post}} = \mathrm{kW_{heaters}} \times \mathrm{Heating\ Hours}$$
$$\mathrm{Heating\ Hours} = \frac{\mathrm{HDD}}{\mathrm{CDD} + \mathrm{HDD}} \times \mathrm{AOH}$$

Where
AOH = Annual Operating Hours
$kW_{heaters}$ = Total kW rating of all VAV boxes with heaters
Heating Hours = Total hours that VAV box heaters spend in heating mode per year
HDD = TMY3 Heating Degree Days (65F)
CDD = TMY3 Cooling Degree Days (65F)

The tables below detail the inputs to the calculations for annual kWh savings and peak kW reductions based on deemed TRM values and a combination of site visit details and initial application.

Insulation Annual kWh Savings

Measure	$kW_{heaters}$	AOH	CDD (65F)	HDD (65F)	Expected kWh Savings	Realized kWh Savings	RR
FCUs & EMS	26.5	4,004	2,890	1,509	55,487	36,405	66%
				Total	55,487	36,405	66%

Results

Verified Gross Savings/Realization Rates

SUMMARY			
Metric	**Expected**	**Measured**	**Realization Rate:**
Annual kWh:	55,487	36,405	66%

The Annual kWh realization rate for this project is 66%.

Discrepancies in kWh savings are a result of a difference in calculated CDD and HDD totals, with HDDs taking up a greater portion of total Degree Days in the analysis, resulting in greater Heating Hours and lower savings.

Project Number CIP_781
Program Small Commercial & Industrial Solutions

Project Background

The participant is an office facility that received incentives from Entergy New Orleans for retrofitting energy efficient lighting. The Evaluators verified that the following had been installed:

- (24) 45W LED Fixture replacing (24) Metal Halide Lamps
- (132) 48W LED Fixture replacing (132) T8 Fluorescent Lamps
- (8) 12W LED replacing (8) T8 Fluorescent Lamps
- (7) 9W LED Screw Based Lamps replacing (7) Halogen/Incandescent Lamps
- (3) 15W LED Screw Based Lamps replacing (3) Halogen/Incandescent Lamps
- (2) 12W LED Fixtures replacing (2) T8 Fluorescent Lamps

Calculation Parameters

The Evaluators conducted a site visit of the project and determined that the project comprised of a custom lighting installation. Saving calculations were performed using savings methodology described in section D.6.3 Commercial Lighting Efficiency of the NO TRM V6.1. Deemed savings parameters applicable to this site are shown below:

Table A. Custom Savings Parameters

Building Type	Heating Type	Annual Hours	IEF_E	IEF_D	CF
Office	Electrical Resistance	5,159	0.87	1.2	0.77

Savings Calculations

Using the values from Table A above, the Evaluators calculated lighting savings as follows:

Table B. Custom Lighting Retrofit kWh Savings Calculations

Measure	Quantity (Fixtures)		Wattage		Annual Operating Hours	Expected kWh Savings	Realized kWh Savings	IEF_E	Realization Rate
	Pre	Post	Pre	Post					
Metal Halide to 45W LED	24	24	288	45	5,159	26,176	26,176	0.87	100%
T8 Fluorescent to 48W LED	132	132	112	48	5,159	9,479	37,917	0.87	400%
T8 Fluorescent to 12W LED	8	8	110	12	5,159	1,113	3,088	0.87	277%
Halogen/Incandescent Lamps to 9W LED	7	7	60	9	5,159	1,602	1,602	0.87	100%
Halogen/Incandescent Lamps to 15W LED	3	3	65	15	5,159	673	673	0.87	100%
T8 Fluorescent to 12W LED	2	2	58	12	5,159	153	413	0.87	270%
Total						**39,197**	**69,870**		**178%**

Table C. Custom Lighting Retrofit kW Reduction Calculations

Measure	Quantity (Fixtures)		Wattage		CF	Expected kW Savings	Realized kW Savings	IEFD	Realization Rate
	Pre	Post	Pre	Post					
Metal Halide to 45W LED	24	24	288	45	0.77	5.39	5.39	1.2	100%
T8 Fluorescent to 48W LED	132	132	112	48	0.77	0.66	7.81	1.2	1,183%
T8 Fluorescent to 12W LED	8	8	110	12	0.77	0.08	0.64	1.2	800%
Halogen/Incandescent Lamps to 9W LED	7	7	60	9	0.77	0.11	0.33	1.2	300%
Halogen/Incandescent Lamps to 15W LED	3	3	65	15	0.77	0.05	0.14	1.2	280%
T8 Fluorescent to 12W LED	2	2	58	12	0.77	0.01	0.09	1.2	900%

Total	**6.29**	**14.38**		**229%**

Results

The kWh and kW realization rates for project CIP_781 are 178% and 229%, respectively.
Discrepancies in the kWh and kW realization rates were due to the baseline fixtures used in the ex post analysis being different than what the ex ante used.

Table G. Verified Gross Savings & Realization Rates

Measure	Verified			
	kWh Savings	kW Savings	kWh Realization Rate	kW Realization Rate
Metal Halide to 45W LED	26,176	5.39	100%	100%
T8 Fluorescent to 48W LED	37,917	7.81	400%	1,183%
T8 Fluorescent to 12W LED	3,088	0.64	277%	800%
Halogen/Incandescent Lamps to 9W LED	1,602	0.33	100%	300%
Halogen/Incandescent Lamps to 15W LED	673	0.14	100%	280%
T8 Fluorescent to 12W LED	413	0.09	270%	900%
Total	**69,870**	**14.38**	**178%**	**229%**

Project Number CIP_790
Program Large Commercial & Industrial Solutions

Project Background

The participant is an office that received incentives from Entergy New Orleans for implementing energy efficient lighting. The implementers verified that the participant had installed:

- (945) 13 W LED Fixtures replacing (945) T8 Fluorescent fixtures;
- (39) 12 W LED Fixtures replacing (39) T8 Fluorescent fixtures;
- (124) 12 W LED Fixtures replacing (124) Compact Fluorescent fixtures;

M&V Methodology

The evaluators found that the lighting wattages deviated from those listed in the project application. Verified DLC wattages were used in ex post savings calculations. The provided project calculator had different expected savings than the tracking data reported. Savings for the lighting measures were calculated using Louisiana stipulated deemed values by space type for hours of use, along with a stipulated peak Coincident Factor (CF), Interactive effects factor for energy (IEF_E) and Interactive effects factor for demand (IEF_D) determined using local weather data and ENO peak parameters. The deemed values used in calculating savings are presented in the table below.

Deemed Savings Parameters

Building Type	Heating Type	Annual Hours	IEF_E	IEF_D	CF
Office	Gas	5,159	1.09	1.20	1.00

Savings Calculations

Using deemed values from the table above, the evaluators calculated lighting savings as follows:

$$\text{Annual kWh Savings} = \left(\text{kW}_{\text{base}} * \text{AOH}_{\text{base}} - \text{kW}_{\text{post}} * \text{AOH}_{\text{post}}\right) * \text{IEF}_{\text{E}}$$

Parameters for kWh Savings Calculation of Lighting Retrofit Measures

kW_{base}	Total Baseline fixtures x $W/Fixture_{base}$ / 1000 W/kW
kWpost	Total Installed fixtures x $W/Fixture_{post}$ / 1000 W/kW
AOH_{base}	Annual Operating Hours of Baseline Fixtures
AOH_{post}	Annual Operating Hours of Installed Fixtures
IEF_E	Heating/Cooling Energy Interactive Effects Factor

Following this, the evaluators calculated peak kW savings. This is based upon Louisiana defined peak hours during summer weekdays. Peak kW savings are calculated as:

$$\text{Peak kW Savings} = \left(\text{kW}_{\text{base}} - \text{kW}_{\text{post}}\right) * \text{CF} * \text{IEF}_{\text{D}}$$

Parameters for Peak Demand (kW) Savings Calculation of Lighting Retrofit Measures

kW_{base}	Total Baseline fixtures x $W/Fixture_{base}$ / 1000 W/kW
kW_{post}	Total Installed fixtures x $W/Fixture_{post}$ / 1000 W/kW
CF	Peak Demand Coincident Factor, % Time During the Peak Period in Which Lighting is Operating
IEF_D	Heating/Cooling Demand Interactive Effects Factor

Lighting Retrofit kWh Savings Calculations

Measure	Quantity (Fixtures)		Wattage		AOH	Expected kWh Savings	Realized kWh Savings	IEF_E	Realization Rate
	Pre	Post	Pre	Post					
T-8 Fluorescent to 13 W LED Fixture	175	175	112	13	5,159	55,783	97,424	1.09	174.6%
T-8 Fluorescent to 13 W LED Fixture	770	770	58	13	5,159	122,209	194,848	1.09	159.4%
T-8 Fluorescent to 12 W LED Fixture	39	39	18	12	5,159	2,193	1,316	1.09	60.0%
Compact Fluorescent to 12 W LED Fixture	63	63	46	12	5,159	12,399	12,045	1.09	97.1%
Compact Fluorescent to 12 W LED Fixture	61	61	46	12	5,159	12,006	11,663	1.09	97.1%
Total						**204,591**	**317,925**	**1.09**	**155.1%**

*Expected savings are based on the provided project calculator, not tracking data.

Lighting Retrofit kW Savings Calculations

Measure	Quantity (Fixtures)		Wattage		CF	Expected kW Savings	Realized kW Savings	IEF_D	Realization Rate
	Pre	Post	Pre	Post					
T-8 Fluorescent to 13 W LED Fixture	175	175	112	13	1.00	11.90	16.01	1.20	134.5%
T-8 Fluorescent to 13 W LED Fixture	770	770	58	13	1.00	26.10	32.02	1.20	122.7%
T-8 Fluorescent to 12 W LED Fixture	39	39	18	12	1.00	0.47	0.22	1.20	46.8%
Compact Fluorescent to 12 W LED Fixture	63	63	46	12	1.00	2.04	1.98	1.20	97.1%
Compact Fluorescent to 12 W LED Fixture	61	61	46	12	1.00	1.97	1.92	1.20	97.5%
Total						**42.48**	**52.14**	**1.20**	**122.7%**

Results

Project CIP_790 has a realization rate of 155% for kWh and 123% for kW. The Ex ante savings estimate claimed 12 W fixtures as either 11 or 8 W leading to discrepancy in both kWh and kW.

Verified Gross Savings & Realization Rates

Verified			
kWh Savings	kW Savings	kWh Realization Rate	kW Realization Rate
317,295	**52.14**	**155%**	**123%**

Project Number CIP_813
Program Large Commercial & Industrial Solutions

Project Background

The participant is an office that received incentives from Entergy New Orleans for implementing energy efficient lighting. The implementers verified that the participant had installed:

- (1) 20 LED Fixtures replacing (2) T8 Fluorescent fixtures;
- (1) 40 W LED Fixtures replacing (4) T8 Fluorescent fixtures;
- (2) 12 W LED Fixtures replacing (2) T8 Fluorescent fixtures;
- (2) 24 W LED Fixtures replacing (4) T8 Fluorescent fixtures;
- (4) 34 W LED Fixtures replacing (4) T8 Fluorescent fixtures;
- (11) 30 W LED Fixtures replacing (22) U-Tube Fluorescent fixtures;
- (7) 25 W LED Fixtures replacing (7) U-Tube Fluorescent fixtures;
- (64) 25 W LED Fixtures replacing (64) T8 Fluorescent fixtures;
- (388) 48 W LED Fixtures replacing (1552) T8 Fluorescent fixtures;
- (5) 9 W LED Screw-Based Fixtures replacing (5) Halogen Lamps;
- (2) 9 W LED Screw-Based Fixtures replacing (2) Halogen Lamps;
- (4) 40 W LED Fixtures replacing (4) Compact Fluorescent;

M&V Methodology

The evaluators found that the lighting wattages deviated from those listed in the project application. Verified DLC wattages were used in ex post savings calculations. The provided project calculator had different expected savings than the tracking data reported. Savings for the lighting measures were calculated using Louisiana stipulated deemed values by space type for hours of use, along with a stipulated peak Coincident Factor (CF), Interactive effects factor for energy (IEF_E) and Interactive effects factor for demand (IEF_D) determined using local weather data and ENO peak parameters. The deemed values used in calculating savings are presented in the table below.

Deemed Savings Parameters

Building Type	Heating Type	Annual Hours	IEF_E	IEF_D	CF
Office	Gas	5,159	1.09	1.20	0.77

Savings Calculations

Using deemed values from the table above, the evaluators calculated lighting savings as follows:

$$\text{Annual kWh Savings} = \left(\text{kW}_{\text{base}} * \text{AOH}_{\text{base}} - \text{kW}_{\text{post}} * \text{AOH}_{\text{post}}\right) * \text{IEF}_{\text{E}}$$

Parameters for kWh Savings Calculation of Lighting Retrofit Measures

kW_{base}	Total Baseline fixtures x $W/Fixture_{base}$ / 1000 W/kW
kWpost	Total Installed fixtures x $W/Fixture_{post}$ / 1000 W/kW
AOH_{base}	Annual Operating Hours of Baseline Fixtures
AOH_{post}	Annual Operating Hours of Installed Fixtures
IEF_E	Heating/Cooling Energy Interactive Effects Factor

Following this, the evaluators calculated peak kW savings. This is based upon Louisiana defined peak hours during summer weekdays. Peak kW savings are calculated as:

$$\text{Peak kW Savings} = (\text{kW}_{\text{base}} - \text{kW}_{\text{post}}) * \text{CF} * \text{IEF}_{\text{D}}$$

Parameters for Peak Demand (kW) Savings Calculation of Lighting Retrofit Measures

kW_{base}	Total Baseline fixtures x $W/Fixture_{base}$ / 1000 W/kW
kW_{post}	Total Installed fixtures x $W/Fixture_{post}$ / 1000 W/kW
CF	Peak Demand Coincident Factor, % Time During the Peak Period in Which Lighting is Operating
IEF_D	Heating/Cooling Demand Interactive Effects Factor

Lighting Retrofit kWh Savings Calculations

Measure	Quantity (Fixtures)		Wattage		AOH	Expected kWh Savings	Realized kWh Savings	IEF_E	Realization Rate
	Pre	Post	Pre	Post					
T-8 Fluorescent to 33 W LED Fixture	2	1	33	20	5,159	73	259	1.09	355%
T-8 Fluorescent to 40 W LED Fixture	4	1	59	40	5,159	107	1,102	1.09	1030%
T-8 Fluorescent to 12 W LED Fixture	2	2	31	12	5,159	214	214	1.09	100%
T-8 Fluorescent to 24 W LED Fixture	4	2	58	24	5,159	382	1,035	1.09	271%
T-8 Fluorescent to 34 W LED Fixture	4	4	58	34	5,159	540	540	1.09	100%
T-8 Fluorescent to 30 W LED Fixture	22	11	59	30	5,159	1,794	5,443	1.09	303%
T-8 Fluorescent to 25 W LED Fixture	7	7	59	25	5,159	1,338	1,338	1.09	100%
T-8 Fluorescent to 25 W LED Fixture	64	64	112	25	5,159	31,311	31,311	1.09	100%
T-8 Fluorescent to 48 W LED Fixture	1552	388	112	48	5,159	139,638	872,738	1.09	625%
Halogen Lamp to 9 W LED Screw	2	2	43	9	5,159	382	382	1.09	100%
Halogen Lamp to 9 W LED Screw	3	3	65	9	5,159	945	945	1.09	100%
Compact Fluorescent to 400 W LED Fixture	4	4	30	40	5,159	2,137	-225	1.09	-10.5%
Total						**178,861**	**915,081**	**1.09**	**512%**

Lighting Retrofit kW Savings Calculations

Measure	Quantity (Fixtures)		Wattage		CF	Expected kW Savings	Realized kW Savings	IEF_D	Realization Rate
	Base	Post	Base	Post					
T-8 Fluorescent to 33 W LED Fixture	2	1	33	20	0.77	0.02	0.04	1.20	89.4%
T-8 Fluorescent to 40 W LED Fixture	4	1	59	40	0.77	0.02	0.18	1.20	200%
T-8 Fluorescent to 12 W LED Fixture	2	2	31	12	0.77	0.05	0.04	1.20	900%
T-8 Fluorescent to 24 W LED Fixture	4	2	58	24	0.77	0.08	0.17	1.20	80.0%
T-8 Fluorescent to 34 W LED Fixture	4	4	58	34	0.77	0.89	0.09	1.20	213%
T-8 Fluorescent to 30 W LED Fixture	22	11	59	30	0.77	0.38	0.89	1.20	10.1%
T-8 Fluorescent to 25 W LED Fixture	7	7	59	25	0.77	0.22	0.22	1.20	234%
T-8 Fluorescent to 25 W LED Fixture	64	64	112	25	0.77	5.15	5.14	1.20	100%
T-8 Fluorescent to 48 W LED Fixture	1552	388	112	48	0.77	29.80	143.40	1.20	99.8%
Halogen Lamp to 9 W LED Screw	2	2	43	9	0.77	0.08	0.06	1.20	481%
Halogen Lamp to 9 W LED Screw	3	3	65	9	0.77	0.20	0.16	1.20	75.0%
Compact Fluorescent to 400 W LED Fixture	4	4	30	40	0.77	0.35	-0.04	1.20	80.0%
Total						**37.24**	**150.39**	**1.20**	**403.8%**

Results

Project CIP_813 has a realization rate of 512% for kWh and 404% for kW. The discrepancy in realization is due to a difference in claimed wattages for pre fixtures, the ex-ante estimate used the wattage of one baseline lamp and not all lamp in the fixtures.

Verified Gross Savings & Realization Rates

Measure	Verified			
	kWh Savings	kW Savings	kWh Realization Rate	kW Realization Rate
Total Savings	915,081	150.39	512%	404%

Project Number CIP_821
Program Small Commercial & Industrial Solutions

Project Background

The participant is a small office facility that received incentives from Entergy New Orleans for an AC Tune Up. The Evaluators verified that the following models received a tune up:

- Trane YSC Single Packaged RTU
- Payne PA13NA Air Conditioner Condensing Unit
- Rheem RA14 Air Conditioner
- Daikin GSXN4 Split System Air Conditioner

Calculation Parameters

The Evaluators conducted a desk review of the project and determined that the project comprised four AC tune ups. Saving calculations were performed using savings methodology described in the NO TRM V6.1. Deemed savings parameters applicable to this site are shown below:

Table A. Prescriptive Savings Parameters

Building Type	kWh/Ton	kW/Ton
Small Office	397	0.162

Savings Calculations

Using the values from Table A above, the Evaluators calculated lighting savings as follows:

Table B. AC Tune Up kWh Savings Calculations

Measure	Qty	Capacity	kWh/Ton	Realized kWh Savings
Trane YSC Single Pac. AC Tune Up	1	6.00	397	2,382
Payne PA13NA AC Tune Up	1	3.71	397	1,472
Rheem RA14 AC Tune Up	1	5.00	397	1,985
Daikin GSXN4 Split Sys. AC Tune Up	1	5.00	397	1,985
Total				**7,824**

Table C. AC Tune Up kW Reduction Calculations

Measure	Qty	Capacity	kW/Ton	Realized kWh Savings
Trane YSC Single Pac. AC Tune Up	1	6.00	0.162	0.97
Payne PA13NA AC Tune Up	1	3.71	0.162	0.60
Rheem RA14 AC Tune Up	1	5.00	0.162	0.81
Daikin GSXN4 Split Sys. AC Tune Up	1	5.00	0.162	0.81
Total				**3.19**

Results

The kWh and kW realization rates for project CIP_821 are 140% and 180%, respectively.

Discrepancies in the kWh and kW realization rate were due to a difference in deemed savings values. The Evaluators used the New Orleans TRM deemed savings value for a small office and the ex ante savings estimate used a kWh/ton amount that did not match any of the New Orleans TRM values

Table G. Verified Gross Savings & Realization Rates

Verified			
kWh Savings	kW Savings	kWh Realization Rate	kW Realization Rate
7,824	3.19	140%	180%

Project Number CIP_824
Program Small Commercial & Industrial Solutions

Project Background

The participant is a small office facility that received incentives from Entergy New Orleans for an AC Tune Up. The Evaluators verified that the following models received a tune up:

- Carrier 50VL Single Packaged Air Conditioner
- Carrier 48TC Air Conditioner
- Lennox LGA Packaged Air Conditioner

Calculation Parameters

The Evaluators conducted a desk review of the project and determined that the project comprised three AC tune ups. Saving calculations were performed using the savings methodology described in section D.3.4 Commercial Air Conditioner and of the NO TRM V6.1. Deemed savings parameters applicable to this site are shown below:

Table A. Prescriptive Savings Parameters

Building Type	kWh/Ton	kW/Ton
Small Office	397	0.162

Savings Calculations

Using the values from Table A above, the Evaluators calculated lighting savings as follows:

Table B. AC Tune Up kWh Savings Calculations

Measure	Qty	Capacity	kWh/Ton	Realized kWh Savings
Carrier 50VL Single Pac. AC Tune Up	1	2.00	397	794
Carrier 48TC AC Tune Up	1	2.47	397	5,757
Lennox LGA Pac. AC Tune Up	1	4.83	397	5,955
Total				**12,506**

Table C. AC Tune Up kW Reduction Calculations

Measure	Qty	Capacity	kW/Ton	Realized kWh Savings
Carrier 50VL Single Pac. AC Tune Up	1	2.00	0.162	0.32
Carrier 48TC AC Tune Up	1	2.47	0.162	2.34
Lennox LGA Pac. AC Tune Up	1	4.83	0.162	2.43
Total				**5.09**

Results

The kWh and kW realization rates for project CIP_824 are 168% and 184%, respectively.

Discrepancies in the kWh and kW realization rate were due to a difference in facility type; ex ante calculations listed facility as a religious building. The Evaluators used New Orleans TRM deemed methods, and it was determined that the facility was a small office, as a religious building was not available for this measure.

Table G. Verified Gross Savings & Realization Rates

Verified			
kWh Savings	**kW Savings**	**kWh Realization Rate**	**kW Realization Rate**
12,506	5.09	168%	184%

Project Number CIP_829
Program Small Commercial & Industrial Solutions

Project Background

The participant is a small office facility that received incentives from Entergy New Orleans for an AC Tune Up. The Evaluators verified that the following model received a tune up:

- Rheem 13ACA Outdoor Condensing Unit
- Ingersoll Rand TTA120 Split System Air Conditioner

Calculation Parameters

THE EVALUATORS conducted a desk review of the project and determined that the project comprised two AC tune ups. Saving calculations were performed using the savings methodology described in section D.3.4 Commercial Air Conditioner and of the NO TRM V6.1. Deemed savings parameters applicable to this site are shown below:

Table A. Prescriptive Savings Parameters

Building Type	kWh/Ton	kW/Ton
Small Office	397	0.162

Savings Calculations

Using the values from Table A above, the Evaluators calculated lighting savings as follows:

Table B. AC Tune Up kWh Savings Calculations

Measure	Qty	Capacity	kWh/ton	Realized kWh Savings
Rheem 13ACA AC Tune Up	1	5.00	397	1,985
Ingersoll Rand TTA120 AC Tune Up	1	10.00	397	3,970
Total				**5,955**

Table C. AC Tune Up kW Reduction Calculations

Measure	Qty	Capacity	kW/ton	Realized kW Savings
Rheem 13ACA AC Tune Up	1	5.00	0.162	0.81
Ingersoll Rand TTA120 AC Tune Up	1	10.00	0.162	1.62
Total				**2.43**

Results

The kWh and kW realization rates for project CIP_829 are 165% and 181%, respectively.

Discrepancies in the kWh and kW realization rate were due to a difference in facility type; ex ante calculations listed facility as a religious building. The Evaluators used the New Orleans TRM deemed methods, and it was determined that the facility was a small office, as a religious building was not available for this measure.

Table G. Verified Gross Savings & Realization Rates

Verified			
kWh Savings	kW Savings	kWh Realization Rate	kW Realization Rate
5,955	2.43	165%	181%

Project Number CIP_830
Program Small Commercial & Industrial Solutions

Project Background

The participant is a small office facility that received incentives from Entergy New Orleans for an AC Tune Up. The Evaluators verified that the following model received a tune up:

- Day & Night NXA6 High Efficiency Air Conditioner
- Frigidaire FSBE High Efficiency Air Conditioner
- Tappan FS5BU High Efficiency Air Conditioner

Calculation Parameters

The Evaluators conducted a desk review of the project and determined that the project comprised four AC tune ups. Saving calculations were performed using the savings methodology described in section D.3.4 Commercial Air Conditioner and of the NO TRM V6.1. Deemed savings parameters applicable to this site are shown below:

Table A. Prescriptive Savings Parameters

Building Type	kWh/Ton	kW/Ton
Small Office	397	0.162

Savings Calculations

Using the values from Table A above, the Evaluators calculated lighting savings as follows:

Table B. AC Tune Up kWh Savings Calculations

Measure	Qty	Capacity	kWh/ton	Realized kWh Savings
NXA6 High Eff AC Tune Up	1	2.87	397	1,138
FSBE High Efficiency AC Tune Up	1	2.47	397	979
FS5BU High Efficiency AC Tune Up	2	4.83	397	1,919
Total				**5,955**

Table C. AC Tune Up kW Reduction Calculations

Measure	Qty	Capacity	kW/ton	Realized kW Savings
NXA6 High Eff AC Tune Up	1	2.87	0.162	0.46
FSBE High Efficiency AC Tune Up	1	2.47	0.162	0.40
FS5BU High Efficiency AC Tune Up	2	4.83	0.162	0.78
Total				**2.43**

Results

The kWh and kW realization rates for project CIP_830 are 170% and 187%, respectively.

Discrepancies in the kWh and kW realization rate were due to a difference in facility type; ex ante calculations listed facility as a religious building. The Evaluators used New Orleans TRM deemed methods, and it was determined that the facility was a small office, as a religious building was not available for this measure.

Table G. Verified Gross Savings & Realization Rates

Verified			
kWh Savings	kW Savings	kWh Realization Rate	kW Realization Rate
5,955	2.43	170%	187%

22 APPENDIX B: COST-EFFECTIVENESS METHODS

22.1 Summary

The Evaluators estimated the cost-effectiveness for the overall energy efficiency and demand response portfolio of programs, based on PY13 costs and savings estimates provided by ENO and their third-party implementers. This appendix provides the cost-effectiveness results, as well as a brief overview of the approach taken by the Evaluators. The portfolio and energy efficiency programs pass all the cost-effectiveness tests except the RIM test. The table below presents the cost-effectiveness results for the PY13 portfolio.

TABLE 22-1 PY13 COST-EFFECTIVENESS RESULTS

Program	TRC	UCT	RIM	PCT	SCT
HPwES	1.18	0.98	0.31	4.71	1.37
RLA	0.69	0.82	0.27	2.96	0.74
MF Solutions	1.35	1.46	0.38	3.96	1.71
IQW	1.26	1.37	0.45	2.90	1.64
A/C Solutions	1.91	1.98	0.47	4.59	2.38
SK&E	0.70	0.68	0.25	6.08	0.79
AR&R	0.09	0.09	0.07	1.73	0.11
Behavioral	0.73	0.73	0.32	NA	0.73
EasyCool (BYOT)	0.63	0.45	0.45	0.00	0.63
PTR Pilot	0.08	0.07	0.07	NA	0.08
BESS Pilot	0.12	0.11	0.11	NA	0.12
Small C&I Solutions	1.37	1.54	0.31	5.98	1.68
Large C&I Solutions	1.70	1.92	0.35	7.09	2.12
PFI	0.96	0.93	0.28	8.28	1.19
C&I NC Solutions	0.13	0.13	0.10	5.36	0.16
Large C&I DR	0.67	0.44	0.43	NA	0.67
EV Charging Pilot	0.04	0.04	0.04	NA	0.04
Total	**1.23**	**1.26**	**0.35**	**5.16**	**1.51**

22.2 Methods

The California Standard Practice Model was used as a guideline for the calculations, along with guidance from the ENO TRM V6.1, the IL TRM V9.0, and the AR TRM v9.1. The cost-effectiveness analysis methods that were used in this analysis are among the set of standard methods used in this industry and include the Utility Cost Test (UCT)[22], Total Resource Cost Test (TRC), Ratepayer Impact Measure Test (RIM), and Participant Cost Test (PCT). All tests weigh monetized benefits against costs. These monetized amounts are presented as Net Present Value (NPV) evaluated over the lifespan of the measure. The benefits and costs differ for each test based on the perspective of the test. The definitions below are taken from the California Standard Practice Manual.

[22] The UCT is also referred to as the Program Administrator Cost Test (PACT).

The TRC measures the net costs of a demand-side management program as a resource option based on the total costs of the program, including both the participants' and the utility's costs.

The UCT measures the net costs of a demand-side management program as a resource option based on the costs incurred by the program administrator (including incentive costs) and excluding any net costs incurred by the participant. The benefits are similar to the TRC benefits. Costs are defined more narrowly.

The PCT is the measure of the quantifiable benefits and costs to the customer due to participation in a program. Since many customers do not base their decision to participate in a program entirely on quantifiable variables, this test cannot be a complete measure of the benefits and costs of a program to a customer.

The RIM test measures what happens to customer bills or rates due to changes in utility revenues and operating costs caused by the program. Rates will go down if the change in revenues from the program is greater than the change in utility costs. Conversely, rates or bills would go up if revenues collected after program implementation is less than the total costs incurred by the utility in implementing the program. This test indicates the direction and magnitude of the expected change in customer bills or rate levels.

A common misperception is that there is a single best perspective for evaluation of cost-effectiveness. Each test is useful and accurate, but the results of each test are intended to answer a different set of questions. The questions to be addressed by each cost test are shown in the table below.[23]

TABLE 22-2 QUESTIONS ADDRESSED BY THE VARIOUS COST TESTS

Cost Test	Questions Addressed
Participant Cost Test (PCT)	▪ Is it worth it to the customer to install energy efficiency?
	▪ Is it likely that the customer wants to participate in a utility program that promotes energy efficiency?
Ratepayer Impact Measure (RIM)	▪ What is the impact of the energy efficiency project on the utility's operating margin?
	▪ Would the project require an increase in rates to reach the same operating margin?
Utility Cost Test (UCT)	▪ Do total utility costs increase or decrease?
	▪ What is the change in total customer bills required to keep the utility whole?
Total Resource Cost Test (TRC)	▪ What is the regional benefit of the energy efficiency project (including the net costs and benefits to the utility and its customers)?
	▪ Are all of the benefits greater than all of the costs (regardless of who pays the costs and who receives the benefits)?
	▪ Is more or less money required by the region to pay for energy needs?

Overall, the results of all four cost-effectiveness tests provide a more comprehensive picture than the use of any one test alone. The TRC cost test addresses whether energy efficiency is cost-effective overall. The PCT, UCT,

[23] https://www.epa.gov/energy/understanding-cost-effectiveness-energy-efficiency-programs

and RIM address whether the selection of measures and design of the program are balanced from the perspective of the participants, utilities, and non-participants. The scope of the benefit and cost components included in each test are summarized in the table below.[24]

TABLE 22-3 BENEFITS AND COSTS INCLUDED IN EACH COST-EFFECTIVENESS TEST

Test	Benefits	Costs
PCT (Benefits and costs from the perspective of the customer installing the measure)	▪ Incentive payments	▪ Incremental equipment costs
	▪ Bill Savings	▪ Incremental installation costs
	▪ Applicable tax credits or incentives	
UCT (Perspective of utility, government agency, or third party implementing the program	▪ Energy-related costs avoided by the utility	▪ Program overhead costs
	▪ Capacity-related costs avoided by the utility, including generation, transmission, and distribution	▪ Utility/program administrator incentive costs
TRC (Benefits and costs from the perspective of all utility customers in the utility service territory)	▪ Energy-related costs avoided by the utility	▪ Program overhead costs
	▪ Capacity-related costs avoided by the utility, including generation, transmission, and distribution	▪ Program installation costs
	▪ Additional resource savings	▪ Incremental measure costs
	▪ Monetized non-energy benefits as outlined by the TRM.	
RIM (Impact of efficiency measure on non-participating ratepayers overall)	▪ Energy-related costs avoided by the utility	▪ Program overhead costs
	▪ Capacity-related costs avoided by the utility, including generation, transmission, and distribution	▪ Lost revenue due to reduced energy bills
		▪ Utility/program administrator installation costs

22.2.1LINE LOSSES

The Evaluators used the line losses provided by ENO for the PY13 evaluation.

[24] *Ibid*.

22.2.2 ECONOMIC INPUTS

The Evaluators used the economic inputs provided by ENO for the cost benefit analysis, this included avoided costs that were estimated using the Real Economic Carrying Charge (RECC) approach. The rates utilized for avoided water from Protocol L in the AR TRM V9.1.

The Evaluators used the discount rates provided by ENO to perform the cost benefit analysis, and these values align with the rates used in the PY11 to PY13 Plan. The evaluated net energy savings (kWh) and demand reductions (kW) values utilized in the cost benefit analysis include a line loss factor, those values are in the table below. Additionally, the table below outlines the discount rates, escalation rate and avoided costs used in the PY13 cost-effectiveness analysis.

TABLE 22-4 ECONOMIC INPUTS FOR COST EFFECTIVENESS ANALYSIS

Discount Rates	
Utility (TRC)	6.86%
Utility (UCT)	6.86%
Utility (RIM)	6.86%
Societal (SCT)	3.00%
Participant (PCT)	10.00%
Line Losses	
Line Losses (demand)	4.66%
Line Losses (energy)	4.19%
Escalation rate	2.00%
Avoided Costs	
Avoided Energy ($/kWh)	$0.05
Avoided Demand ($/kW)	$84.59

22.3 Findings

The tables below outline the results for each test, for both the programs and the portfolio as a whole.

TABLE 22-5 PY13 COST-EFFECTIVENESS RESULTS BY PROGRAM

Program	TRC	UCT	RIM	PCT	SCT
HPwES	1.18	0.98	0.31	4.71	1.37
RLA	0.69	0.82	0.27	2.96	0.74
MF Solutions	1.35	1.46	0.38	3.96	1.71
IQW	1.26	1.37	0.45	2.90	1.64
A/C Solutions	1.91	1.98	0.47	4.59	2.38
SK&E	0.70	0.68	0.25	6.08	0.79
AR&R	0.09	0.09	0.07	1.73	0.11
Behavioral	0.73	0.73	0.32	NA	0.73
EasyCool (BYOT)	0.63	0.45	0.45	0.00	0.63
PTR Pilot	0.08	0.07	0.07	NA	0.08
BESS Pilot	0.12	0.11	0.11	NA	0.12
Small C&I Solutions	1.37	1.54	0.31	5.98	1.68
Large C&I Solutions	1.70	1.92	0.35	7.09	2.12
PFI	0.96	0.93	0.28	8.28	1.19
C&I NC Solutions	0.13	0.13	0.10	5.36	0.16
Large C&I DR	0.67	0.44	0.43	NA	0.67
EV Charging Pilot	0.04	0.04	0.04	NA	0.04
Total	**1.23**	**1.26**	**0.35**	**5.16**	**1.51**

Sums may differ due to rounding.

TABLE 22-6 PY13 COST-EFFECTIVENESS BENEFITS BY PROGRAM

Program	TRC Benefits	UCT Benefits	RIM Benefits	PCT Benefits	SCT Benefits
HPwES	$2,044,390	$2,030,270	$2,030,270	$5,238,719	$2,387,110
RLA	$925,224	$897,462	$897,462	$2,583,878	$984,117
MF Solutions	$1,502,868	$1,501,505	$1,501,505	$3,166,771	$1,897,279
IQW	$3,677,510	$3,675,061	$3,675,061	$6,384,326	$4,771,482
A/C Solutions	$1,572,031	$1,572,031	$1,572,031	$2,743,490	$1,954,042
SK&E	$220,772	$215,520	$215,520	$573,659	$250,516
AR&R	$32,151	$32,151	$32,151	$151,695	$41,473
Behavioral	$408,318	$408,318	$408,318	$737,157	$408,318
EasyCool (BYOT)	$353,484	$353,484	$353,484	$230,725	$353,484
PTR Pilot	$17,786	$17,786	$17,786	$12,880	$17,786
BESS Pilot	$7,122	$7,122	$7,122	$9,350	$7,122
Small C&I Solutions	$1,073,709	$1,009,400	$1,009,400	$2,526,249	$1,317,403
Large C&I Solutions	$10,550,895	$10,172,215	$10,172,215	$22,858,816	$13,133,586
PFI	$1,295,130	$1,206,740	$1,206,740	$3,001,478	$1,600,822
C&I NC Solutions	$83,953	$83,791	$83,791	$180,532	$105,159
Large C&I DR	$271,432	$271,432	$271,432	$216,839	$271,432
EV Charging Pilot	$4,385	$4,385	$4,385	$3,458	$4,385
Total	**$24,041,159**	**$23,458,672**	**$23,458,672**	**$50,620,022**	**$29,505,516**

Sums may differ due to rounding.

TABLE 22-7 PY13 COST-EFFECTIVENESS COSTS BY PROGRAM

Program	TRC Costs	UCT Costs	RIM Costs	PCT Costs	SCT Costs
HPwES	$1,739,128	$2,074,409	$6,655,140	$1,111,290	$1,739,128
RLA	$1,336,578	$1,098,581	$3,349,073	$872,560	$1,336,578
MF Solutions	$1,112,310	$1,030,305	$3,947,306	$799,119	$1,112,310
IQW	$2,908,758	$2,680,505	$8,100,245	$2,200,133	$2,908,758
A/C Solutions	$822,571	$792,747	$3,359,733	$598,264	$822,571
SK&E	$317,290	$316,944	$854,729	$94,346	$317,290
AR&R	$365,531	$362,820	$443,184	$87,812	$365,531
Behavioral	$556,195	$556,195	$1,293,352	$0	$556,195
EasyCool (BYOT)	$557,417	$788,142	$788,142	$0	$557,417
PTR Pilot	$227,818	$240,698	$240,698	$0	$227,818
BESS Pilot	$57,392	$66,742	$66,742	$0	$57,392
Small C&I Solutions	$783,962	$653,896	$3,208,150	$422,461	$783,962
Large C&I Solutions	$6,188,504	$5,311,455	$29,121,169	$3,223,622	$6,188,504
PFI	$1,349,981	$1,295,405	$4,382,197	$362,297	$1,349,981
C&I NC Solutions	$671,489	$669,638	$845,358	$33,707	$671,489
Large C&I DR	$408,037	$616,617	$624,876	$0	$408,037
EV Charging Pilot	$120,388	$123,846	$123,846	$0	$120,388
Total	**$19,523,348**	**$18,678,943**	**$67,403,940**	**$9,805,609**	**$19,523,348**

Sums may differ due to rounding.

TABLE 22-8 PY13 COST-EFFECTIVENESS NET BENEFITS BY PROGRAM

Program	TRC Net Benefits	UCT Net Benefits	RIM Net Benefits	PCT Net Benefits	SCT Net Benefits
HPwES	$305,261	-$44,139	-$4,624,870	$4,127,429	$1,275,820
RLA	-$411,354	-$201,120	-$2,451,611	$1,711,319	$111,557
MF Solutions	$390,558	$471,201	-$2,445,801	$2,367,652	$1,098,160
IQW	$768,752	$994,556	-$4,425,184	$4,184,193	$2,571,349
A/C Solutions	$749,459	$779,284	-$1,787,702	$2,145,227	$1,355,779
SK&E	-$96,518	-$101,424	-$639,209	$479,313	$156,170
AR&R	-$333,380	-$330,668	-$411,033	$63,883	-$46,339
Behavioral	-$147,877	-$147,877	-$885,034	$737,157	$408,318
EasyCool (BYOT)	-$203,934	-$434,659	-$434,659	$230,725	$353,484
PTR Pilot	-$210,032	-$222,912	-$222,912	$12,880	$17,786
BESS Pilot	-$50,270	-$59,620	-$59,620	$9,350	$7,122
Small C&I Solutions	$289,748	$355,504	-$2,198,750	$2,103,788	$894,942
Large C&I Solutions	$4,362,390	$4,860,761	-$18,948,953	$19,635,194	$9,909,964
PFI	-$54,851	-$88,665	-$3,175,457	$2,639,181	$1,238,525
C&I NC Solutions	-$587,536	-$585,847	-$761,567	$146,825	$71,452
Large C&I DR	-$136,604	-$345,185	-$353,444	$216,839	$271,432
EV Charging Pilot	-$116,003	-$119,461	-$119,461	$3,458	$4,385
Total	**$4,517,812**	**$4,779,730**	**-$43,945,268**	**$40,814,413**	**$19,699,906**

Sums may differ due to rounding.

23 APPENDIX C: BEHAVIORAL PROGRAM MODEL OUTPUT

This section summarizes the post-program regression model output for each of the cohorts evaluated through the Behavioral Program.

23.1 Validity Testing

The tables below detail the average daily energy consumption differences and statistical significance between each cohort's treatment and control groups for each of the 12 months in the pre-period, relative to each cohort's intervention date prior to propensity score matching activities.

TABLE 23-1 PY13 NEIGHBOR COMPARE – ADM VALIDITY TESTING RESULTS

Pre-Period Month	Treatment Group Average Daily Usage (kWh/day)	Control Group Average Daily Usage (kWh/day)	Average Daily Usage Difference (kWh/day)	P-value	Statistically Significant Difference
Mar 2020	27.60	27.28	0.33	0.5441	-
Apr 2020	24.08	23.69	0.39	0.3981	-
May 2020	29.38	29.07	0.31	0.5727	-
Jun 2020	38.72	38.92	-0.20	0.7792	-
Jul 2020	42.52	42.28	0.24	0.7330	-
Aug 2020	43.28	43.18	0.09	0.8983	-
Sep 2020	36.74	37.09	-0.35	0.6040	-
Oct 2020	26.82	26.79	0.02	0.9621	-
Nov 2020	22.62	22.34	0.28	0.4989	-
Dec 2020	31.54	31.29	0.25	0.7127	-
Jan 2020	34.19	34.04	0.15	0.8385	-
Feb 2021	35.21	34.49	0.71	0.5357	-

TABLE 23-2 PY13 NEIGHBOR COMPARE – NEW VALIDITY TESTING RESULTS

Pre-Period Month	Treatment Group Average Daily Usage (kWh/day)	Control Group Average Daily Usage (kWh/day)	Average Daily Usage Difference (kWh/day)	P-value	Statistically Significant Difference
Oct 2019	37.13	37.91	-0.78	0.3129	-
Nov 2019	37.27	37.96	-0.69	0.2197	-
Dec 2019	40.56	41.09	-0.52	0.3964	-
Jan 2020	40.35	41.11	-0.77	0.2165	-
Feb 2020	36.66	37.38	-0.72	0.2026	-
Mar 2020	38.36	39.37	-1.01	0.0424	*
Apr 2020	33.94	33.99	-0.05	0.9103	-
May 2020	43.22	43.33	-0.11	0.8260	-
Jun 2020	55.00	54.89	0.11	0.8548	-
Jul 2020	59.47	59.50	-0.03	0.9655	-
Aug 2020	60.75	60.46	0.29	0.6392	-
Sep 2020	48.44	48.46	-0.02	0.9684	-

TABLE 23-3 PY13 NEIGHBOR COMPARE – ORIGINAL VALIDITY TESTING RESULTS

Pre-Period Month	Treatment Group Average Daily Usage (kWh/day)	Control Group Average Daily Usage (kWh/day)	Average Daily Usage Difference (kWh/day)	P-value	Statistically Significant Difference
Jun 2019	56.11	58.34	-2.24	0.9250	-
Jul 2019	49.22	49.95	-0.73	0.4633	-
Aug 2019	47.13	47.80	-0.67	0.4464	-
Sep 2019	48.37	49.00	-0.63	0.4872	-
Oct 2019	33.89	34.51	-0.62	0.3918	-
Nov 2019	30.92	30.77	0.15	0.8397	-
Dec 2019	32.33	32.05	0.28	0.7242	-
Jan 2020	32.69	32.54	0.15	0.8502	-
Feb 2020	30.83	30.31	0.52	0.4797	-
Mar 2020	29.48	29.72	-0.25	0.6989	-
Apr 2020	26.85	27.38	-0.53	0.3259	-
May 2020	32.47	33.26	-0.79	0.2394	-

TABLE 23-4 PY13 NEIGHBOR COMPARE – PRINT VALIDITY TESTING RESULTS

Pre-Period Month	Treatment Group Average Daily Usage (kWh/day)	Control Group Average Daily Usage (kWh/day)	Average Daily Usage Difference (kWh/day)	P-value	Statistically Significant Difference
Oct 2019	31.17	30.72	0.45	0.6713	-
Nov 2019	32.05	32.20	-0.15	0.8653	-
Dec 2019	36.35	35.16	1.20	0.2353	-
Jan 2020	34.14	33.89	0.24	0.7974	-
Feb 2020	30.60	31.04	-0.44	0.6241	-
Mar 2020	31.61	31.43	0.18	0.8085	-
Apr 2020	28.24	27.90	0.35	0.6043	-
May 2020	37.14	36.93	0.21	0.8048	-
Jun 2020	47.98	47.74	0.24	0.8217	-
Jul 2020	51.30	50.55	0.75	0.4627	-
Aug 2020	52.92	52.69	0.22	0.8375	-
Sep 2020	40.15	39.36	0.79	0.3954	-

TABLE 23-5 PY13 SELF COMPARE – NEW VALIDITY TESTING RESULTS

Pre-Period Month	Treatment Group Average Daily Usage (kWh/day)	Control Group Average Daily Usage (kWh/day)	Average Daily Usage Difference (kWh/day)	P-value	Statistically Significant Difference
Oct 2019	34.17	35.62	-1.45	0.3441	-
Nov 2019	33.89	34.40	-0.51	0.6816	-
Dec 2019	37.25	37.50	-0.25	0.8572	-
Jan 2020	35.72	37.14	-1.42	0.2931	-
Feb 2020	32.63	32.97	-0.35	0.7771	-
Mar 2020	35.16	35.40	-0.24	0.8308	-
Apr 2020	30.93	31.29	-0.36	0.7142	-
May 2020	40.40	41.08	-0.68	0.5716	-
Jun 2020	51.08	51.75	-0.67	0.6378	-
Jul 2020	53.75	54.83	-1.08	0.4255	-
Aug 2020	55.79	56.46	-0.67	0.6434	-
Sep 2020	42.78	44.46	-1.68	0.1927	-

TABLE 23-6 PY13 SELF COMPARE – ORIGINAL VALIDITY TESTING RESULTS PRIOR TO PSM

Pre-Period Month	Treatment Group Average Daily Usage (kWh/day)	Control Group Average Daily Usage (kWh/day)	Average Daily Usage Difference (kWh/day)	P-value	Statistically Significant Difference
Jun 2019	56.86	81.06	-24.20	0.0531	-
Jul 2019	42.38	38.53	3.84	0.0174	*
Aug 2019	42.20	37.96	4.24	0.0014	*
Sep 2019	43.11	37.76	5.35	0.0001	*
Oct 2019	29.82	26.75	3.07	0.0018	*
Nov 2019	27.32	24.24	3.08	0.0047	*
Dec 2019	29.79	26.07	3.71	0.0025	*
Jan 2020	28.99	25.29	3.70	0.0014	*
Feb 2020	27.77	23.84	3.92	0.0006	*
Mar 2020	27.18	23.22	3.96	0.0000	*
Apr 2020	23.90	19.86	4.04	0.0000	*
May 2020	29.87	24.10	5.77	0.0000	*

TABLE 23-7 PY13 SELF COMPARE – ORIGINAL VALIDITY TESTING RESULTS AFTER PSM

Pre-Period Month	Treatment Group Average Daily Usage (kWh/day)	Control Group Average Daily Usage (kWh/day)	Average Daily Usage Difference (kWh/day)	P-value	Statistically Significant Difference
Jun 2019	78.38	56.86	21.52	0.0697	-
Jul 2019	43.61	41.89	1.71	0.3354	-
Aug 2019	41.37	41.73	-0.36	0.8111	-
Sep 2019	42.49	42.69	-0.20	0.8945	-
Oct 2019	31.19	29.80	1.39	0.2579	-
Nov 2019	27.63	27.14	0.48	0.6782	-
Dec 2019	29.65	29.63	0.02	0.9905	-
Jan 2020	29.19	28.85	0.34	0.7768	-
Feb 2020	27.90	27.74	0.17	0.8944	-
Mar 2020	27.86	27.01	0.85	0.4319	-
Apr 2020	23.93	24.01	-0.09	0.9274	-
May 2020	29.21	29.35	-0.14	0.9037	-

The Evaluators conducted propensity score matching for the self compare cohorts. All cohorts passed validity testing. The results of propensity score matching are summarized in the next section of this report.

23.2 Model Output

The tables in this section summarize each cohort's model results, including model terms, coefficients, confidence intervals, t-statistics, and p-values. In addition, adjusted R-squared values are demonstrated for each cohort.

TABLE 23-8 PY13 NEIGHBOR COMPARE – ADM PPR MODEL ESTIMATES

Variable	Coefficient	90% CI Lower	90% CI Upper	t-statistic	P-value
(Intercept)	5.3282	6.3882	6.8739	44.9079	<0.0001
trmt	6.3282	0.1475	0.3654	3.8728	0.0001
month2	7.3282	2.0746	2.8032	11.0121	<0.0001
month3	8.3282	1.9752	2.6381	11.4482	<0.0001
month4	9.3282	-0.9439	-0.2803	-3.0344	0.0024
month5	10.3282	1.8036	2.4749	10.4843	<0.0001
month6	11.3282	2.9126	3.6156	15.2742	<0.0001
month7	12.3282	2.7600	3.4588	14.6387	<0.0001
month8	13.3282	3.9600	4.6645	20.1381	<0.0001
month9	14.3282	2.3202	3.0094	12.7187	<0.0001
month10	15.3282	-1.5090	-0.8297	-5.6626	<0.0001
month11	16.3282	-2.0406	-1.3683	-8.3406	<0.0001
month12	17.3282	-1.3917	-0.7432	-5.4151	<0.0001
daily_usage_pre	18.3282	0.5516	0.5617	182.5881	<0.0001
month2:daily_usage_pre	19.3282	-0.0576	-0.0413	-9.9506	<0.0001
month3:daily_usage_pre	20.3282	0.0344	0.0515	8.2754	<0.0001
month4:daily_usage_pre	21.3282	0.1025	0.1213	19.6263	<0.0001
month5:daily_usage_pre	22.3282	0.2352	0.2520	47.8349	<0.0001
month6:daily_usage_pre	23.3282	0.3551	0.3703	78.5351	<0.0001
month7:daily_usage_pre	24.3282	0.3372	0.3516	78.6317	<0.0001
month8:daily_usage_pre	25.3282	0.4310	0.4456	99.0074	<0.0001
month9:daily_usage_pre	26.3282	0.2805	0.2958	62.0261	<0.0001
month10:daily_usage_pre	27.3282	0.1483	0.1666	28.2452	<0.0001
month11:daily_usage_pre	28.3282	0.2293	0.2496	38.7540	<0.0001
month12:daily_usage_pre	29.3282	0.1678	0.1827	38.5667	<0.0001
Adjusted R-Squared	**0.6865**				

TABLE 23-9 PY13 NEIGHBOR COMPARE – NEW PPR MODEL ESTIMATES

Variable	Coefficient	90% CI Lower	90% CI Upper	t-statistic	P-value
(Intercept)	11.6692	11.3814	11.9570	66.6913	<0.0001
trmt	-0.4256	-0.5768	-0.2744	-4.6290	<0.0001
month2	1.0827	0.7130	1.4524	4.8168	<0.0001
month3	1.2277	0.8526	1.6027	5.3837	<0.0001
month4	-4.2030	-4.5796	-3.8264	-18.3563	<0.0001
month5	0.0215	-0.3659	0.4090	0.0914	0.9272
month6	2.2654	1.8541	2.6766	9.0608	<0.0001
month7	1.4421	1.0265	1.8577	5.7074	<0.0001
month8	5.1950	4.7753	5.6147	20.3585	<0.0001
month9	3.5000	3.1054	3.8946	14.5896	<0.0001
month10	-1.5784	-1.9899	-1.1668	-6.3088	<0.0001
month11	-0.4518	-0.8133	-0.0903	-2.0555	0.0398
month12	0.1513	-0.2049	0.5075	0.6989	0.4846
daily_usage_pre	0.5061	0.5012	0.5110	169.4367	<0.0001
month2:daily_usage_pre	0.0490	0.0414	0.0566	10.5788	<0.0001
month3:daily_usage_pre	0.0157	0.0079	0.0234	3.3408	0.0008
month4:daily_usage_pre	0.1508	0.1424	0.1591	29.6099	<0.0001
month5:daily_usage_pre	0.2593	0.2518	0.2669	56.4455	<0.0001
month6:daily_usage_pre	0.3865	0.3794	0.3936	89.2404	<0.0001
month7:daily_usage_pre	0.3921	0.3852	0.3991	93.2002	<0.0001
month8:daily_usage_pre	0.4545	0.4476	0.4615	107.2394	<0.0001
month9:daily_usage_pre	0.3263	0.3191	0.3336	73.8827	<0.0001
month10:daily_usage_pre	0.1197	0.1111	0.1283	22.7841	<0.0001
month11:daily_usage_pre	-0.0363	-0.0436	-0.0289	-8.1321	<0.0001
month12:daily_usage_pre	0.0657	0.0588	0.0726	15.7199	<0.0001
Adjusted R-Squared	**0.7090**				

TABLE 23-10 PY13 NEIGHBOR COMPARE – ORIGINAL PPR MODEL ESTIMATES

Variable	Coefficient	90% CI Lower	90% CI Upper	t-statistic	P-value
(Intercept)	9.1531	8.7350	9.5711	36.0154	<0.0001
trmt	0.0741	-0.1522	0.3003	0.5386	0.5902
month2	0.7217	0.1836	1.2598	2.2060	0.0274
month3	0.6629	0.1313	1.1945	2.0510	0.0403
month4	-3.3326	-3.8732	-2.7919	-10.1395	<0.0001
month5	-0.0955	-0.6410	0.4500	-0.2880	0.7734
month6	1.3013	0.6839	1.9187	3.4668	0.0005
month7	8.7598	8.1971	9.3226	25.6053	<0.0001
month8	8.7610	8.2002	9.3219	25.6943	<0.0001
month9	3.8024	3.2416	4.3632	11.1526	<0.0001
month10	1.5014	0.9637	2.0391	4.5926	<0.0001
month11	-0.3537	-0.8795	0.1721	-1.1065	0.2685
month12	-0.0753	-0.5897	0.4392	-0.2407	0.8098
daily_usage_pre	0.5515	0.5429	0.5601	105.8406	<0.0001
month2:daily_usage_pre	0.0443	0.0311	0.0575	5.5319	<0.0001
month3:daily_usage_pre	0.0389	0.0253	0.0524	4.7219	<0.0001
month4:daily_usage_pre	0.1200	0.1053	0.1347	13.4101	<0.0001
month5:daily_usage_pre	0.2288	0.2155	0.2422	28.2116	<0.0001
month6:daily_usage_pre	0.3575	0.3440	0.3711	43.4371	<0.0001
month7:daily_usage_pre	0.1029	0.0917	0.1141	15.0810	<0.0001
month8:daily_usage_pre	0.2315	0.2201	0.2430	33.2247	<0.0001
month9:daily_usage_pre	0.0378	0.0266	0.0491	5.5201	<0.0001
month10:daily_usage_pre	-0.0979	-0.1106	-0.0853	-12.7335	<0.0001
month11:daily_usage_pre	-0.0488	-0.0616	-0.0360	-6.2671	<0.0001
month12:daily_usage_pre	0.0902	0.0780	0.1023	12.2130	<0.0001
Adjusted R-Squared	**0.6080**				

TABLE 23-11 PY13 NEIGHBOR COMPARE – PRINT PPR MODEL ESTIMATES

Variable	Coefficient	90% CI Lower	90% CI Upper	t-statistic	P-value
(Intercept)	8.2271	7.6850	8.7692	24.9614	<0.0001
trmt	-0.7344	-0.9751	-0.4936	-5.0175	<0.0001
month2	0.3045	-0.4462	1.0552	0.6671	0.5047
month3	0.9249	0.1759	1.6739	2.0312	0.0422
month4	-3.0570	-3.8075	-2.3065	-6.7000	<0.0001
month5	-0.6290	-1.4010	0.1431	-1.3401	0.1802
month6	1.5258	0.7099	2.3417	3.0760	0.0021
month7	0.9826	0.1680	1.7972	1.9842	0.0472
month8	4.0124	3.1870	4.8379	7.9956	<0.0001
month9	4.6026	3.8330	5.3722	9.8371	<0.0001
month10	-0.2036	-0.9902	0.5830	-0.4258	0.6703
month11	-0.5613	-1.2916	0.1690	-1.2642	0.2062
month12	1.5166	0.8054	2.2277	3.5080	0.0005
daily_usage_pre	0.5944	0.5831	0.6057	86.7483	<0.0001
month2:daily_usage_pre	0.0475	0.0295	0.0654	4.3577	<0.0001
month3:daily_usage_pre	-0.0037	-0.0217	0.0143	-0.3362	0.7368
month4:daily_usage_pre	0.0944	0.0752	0.1137	8.0580	<0.0001
month5:daily_usage_pre	0.2126	0.1954	0.2298	20.3682	<0.0001
month6:daily_usage_pre	0.3422	0.3262	0.3582	35.1234	<0.0001
month7:daily_usage_pre	0.3492	0.3337	0.3647	37.1289	<0.0001
month8:daily_usage_pre	0.4137	0.3981	0.4293	43.6274	<0.0001
month9:daily_usage_pre	0.2697	0.2533	0.2861	27.0399	<0.0001
month10:daily_usage_pre	0.0396	0.0205	0.0587	3.4173	0.0006
month11:daily_usage_pre	-0.0416	-0.0585	-0.0247	-4.0437	<0.0001
month12:daily_usage_pre	-0.0018	-0.0172	0.0135	-0.1987	0.8425
Adjusted R-Squared	**0.7337**				

TABLE 23-12 PY13 SELF COMPARE – NEW PPR MODEL ESTIMATES

Variable	Coefficient	90% CI Lower	90% CI Upper	t-statistic	P-value
(Intercept)	9.0930	8.2932	9.8928	18.7003	<0.0001
trmt	-0.1554	-0.5039	0.1930	-0.7338	0.4631
month2	0.1456	-0.9680	1.2592	0.2151	0.8297
month3	0.7899	-0.3211	1.9009	1.1695	0.2422
month4	-2.9245	-4.0290	-1.8199	-4.3552	<0.0001
month5	-0.1628	-1.3002	0.9747	-0.2354	0.8139
month6	1.4649	0.2560	2.6738	1.9932	0.0462
month7	0.9174	-0.2935	2.1284	1.2462	0.2127
month8	4.6729	3.4523	5.8935	6.2971	<0.0001
month9	4.2165	3.0751	5.3579	6.0765	<0.0001
month10	0.4584	-0.6967	1.6136	0.6528	0.5139
month11	0.4777	-0.5961	1.5515	0.7317	0.4643
month12	1.1273	0.0723	2.1823	1.7576	0.0788
daily_usage_pre	0.5714	0.5554	0.5874	58.8871	<0.0001
month2:daily_usage_pre	0.0716	0.0462	0.0969	4.6419	<0.0001
month3:daily_usage_pre	0.0246	-0.0002	0.0494	1.6302	0.1031
month4:daily_usage_pre	0.1200	0.0937	0.1463	7.5029	<0.0001
month5:daily_usage_pre	0.2325	0.2088	0.2562	16.1473	<0.0001
month6:daily_usage_pre	0.3566	0.3341	0.3792	25.9941	<0.0001
month7:daily_usage_pre	0.3706	0.3486	0.3926	27.7221	<0.0001
month8:daily_usage_pre	0.4188	0.3968	0.4408	31.2840	<0.0001
month9:daily_usage_pre	0.3117	0.2886	0.3347	22.2723	<0.0001
month10:daily_usage_pre	0.0504	0.0246	0.0763	3.2153	0.0013
month11:daily_usage_pre	-0.0751	-0.0987	-0.0514	-5.2194	<0.0001
month12:daily_usage_pre	0.0172	-0.0049	0.0392	1.2809	0.2002
Adjusted R-Squared	**0.7134**				

TABLE 23-13 PY13 SELF COMPARE – NEW PPR MODEL ESTIMATES

Variable	Coefficient	90% CI Lower	90% CI Upper	t-statistic	P-value
(Intercept)	6.9728	6.0801	7.8654	12.8489	<0.0001
trmt	-0.7530	-1.1393	-0.3667	-3.2066	0.0013
month2	0.9523	-0.3273	2.2319	1.2241	0.2209
month3	0.3254	-0.9406	1.5914	0.4228	0.6725
month4	-0.4844	-1.7474	0.7786	-0.6309	0.5281
month5	1.1849	-0.0855	2.4553	1.5343	0.1250
month6	2.9793	1.4494	4.5092	3.2032	0.0014
month7	8.8509	7.5502	10.1515	11.1936	<0.0001
month8	7.3864	6.1148	8.6581	9.5545	<0.0001
month9	5.5375	4.2689	6.8060	7.1804	<0.0001
month10	3.3505	2.1047	4.5963	4.4239	<0.0001
month11	0.7592	-0.4605	1.9789	1.0239	0.3059
month12	2.3819	1.2144	3.5494	3.3558	0.0008
daily_usage_pre	0.6289	0.6027	0.6550	39.5006	<0.0001
month2:daily_usage_pre	0.0214	-0.0197	0.0625	0.8557	0.3922
month3:daily_usage_pre	0.0692	0.0253	0.1131	2.5933	0.0095
month4:daily_usage_pre	0.0639	0.0166	0.1112	2.2203	0.0264
month5:daily_usage_pre	0.2134	0.1716	0.2551	8.4100	<0.0001
month6:daily_usage_pre	0.3038	0.2601	0.3476	11.4331	<0.0001
month7:daily_usage_pre	0.0314	-0.0023	0.0652	1.5318	0.1256
month8:daily_usage_pre	0.2113	0.1773	0.2452	10.2370	<0.0001
month9:daily_usage_pre	-0.0469	-0.0804	-0.0133	-2.2988	0.0215
month10:daily_usage_pre	-0.1884	-0.2271	-0.1497	-8.0134	<0.0001
month11:daily_usage_pre	-0.0980	-0.1372	-0.0589	-4.1172	<0.0001
month12:daily_usage_pre	-0.0353	-0.0704	-0.0003	-1.6593	0.0971
Adjusted R-Squared	**0.5602**				