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July 29, 2022

<u>**VIA ELECTRONIC DELIVERY**</u>
Ms. Lora W. Johnson, CMC, LMMC
Clerk of Council
City Hall, Room 1E09
1300 Perdido Street
New Orleans, Louisiana 70112

RE: Filing of Entergy New Orleans, LLC's Energy Smart Program Application for Approval of the Implementation Plan for Program Years 13-15 (Docket Nos. UD-20-02 and UD-08-02)

Dear Ms. Johnson:

Entergy New Orleans, LLC ("ENO") respectfully submits the Application for Approval of the Implementation Plan for Program Years 13-15 of the Energy Smart Program with Exhibits attached thereto. As a result of the remote operations of the Council's office related to Covid-19, ENO submits this filing electronically and will submit the original and requisite number of hard copies once the Council resumes normal operations, or as you direct. ENO requests that you file this submission in accordance with Council regulations as modified for the present circumstances.

Should you have any questions regarding this filing, please contact my office at (504) 576-6571. Thank you for your assistance with this matter.

Sincerely,

Lacresha Wilkerson

Enclosures

cc: Official Service List (*via email*)

IN RE: RESOLUTION REGARDING) PROPOSED RULEMAKING TO) ESTABLISH INTEGRATED) RESOURCE PLANNING) COMPONENTS AND REPORTING) REQUIREMENTS FOR) ENTERGY NEW ORLEANS, LLC)	DOCKET NOs. UD-20-02 and UD-08-02

APPLICATION OF ENTERGY NEW ORLEANS, LLC
FOR APPROVAL OF THE IMPLEMENTATION PLAN
FOR PROGRAM YEARS 13 THROUGH 15 OF THE ENERGY SMART PLAN

Entergy New Orleans, LLC ("Entergy New Orleans" or "ENO") respectfully submits this Application for Approval of the Implementation Plan for Program Years 13 through 15 of the Energy Smart Plan (the "Application"), and in support of this Application, ENO respectfully states as follows:

ENO is an electric and gas utility organized and operating under the laws of Louisiana, with its general office and principal place of business at 1600 Perdido Street, Building 505, New Orleans, Louisiana 70112. ENO manufactures, produces, transmits, distributes, and sells electricity to approximately 208,000 residential, commercial, industrial, and governmental consumers in Orleans Parish. Entergy New Orleans also provides natural gas service throughout Orleans Parish, including Algiers, serving approximately 109,000 retail gas customers.

In July 2009, ENO submitted a filing in which it detailed the specifics of the design and funding levels for programs to be included in the Energy Smart Plan programs (*e.g.,* selection of a third party administrator, verification of deemed savings calculations, proposed goals and targets). On September 17, 2009, Council Resolution No. R-09-483 approved the Energy Smart Plan programs as designed and found ENO's programs to be just, reasonable, and in the public interest, including funding levels, allocations, goals, and targets recommended by ENO.

In April 2011, ENO and the third party administrator, CLEAResult, implemented the Energy Smart Plan programs and began offering programs to ENO electric customers. In October 2012, ENO and Entergy Louisiana LLC implemented energy efficiency programs for the first time in Algiers as approved by Council Resolution No. R-12-391.

Council Resolution No. R-13-17, dated January 24, 2013, stated that the Council wanted to consider ENO's Supplemental Implementation and Cost Recovery filings in concert with the public process established in the Integrated Resource Planning ("IRP") Docket (Docket No. UD-08-02) and such other recommendations as may be provided by intervenors and the Council's Advisors in a timely fashion, and directed ENO to make its Supplemental Implementation and Cost Recovery filing for the continuation of Energy Smart programs after Program Year 3.

In accordance with Council Resolution No. R-12-393, on April 1, 2013, in order to assure the continuity of the Energy Smart Plan, the Companies filed with the Council implementation and cost recovery plans for future energy efficiency and demand side management programs based on

optimal levels contained in their ("IRP") filings or other such programs as determined by the Council.

The Council approved Resolutions Nos. R-14-122, R-14-227 and R-14-509, which extended the ENO and ELL-Algiers Energy Smart programs from April 1, 2014 through March 31, 2015, respectively. As a result, Resolution No. R-14-509 required the Companies to file detailed implementation plans to extend the programs until successor programs could begin.

Pursuant to Resolutions Nos. R-14-509 and R-13-363, on December 29, 2014, the Companies proposed their Supplemental Implementation and Cost Recovery Plan for the energy efficiency programs for the two-year period, April 1, 2015 through March 31, 2017 (Program Years 5 and 6). Council Resolutions Nos. R-15-140 and R-15-499 approved the programs, budgets and kWh savings goals for Program Years 5 and 6.

Program Years 7-9

Council Resolution No. R-15-140 required ENO to issue a Request for Proposals ("RFP") for a Third Party Administrator for Energy Smart programs for the three-year period, April 1, 2017 through March 31, 2020 (Program Years 7-9). In accordance with Resolution No. R-15-140, ENO conducted an RFP and ultimately selected CB&I Environmental and Infrastructure, Inc. (subsequently renamed Aptim) as the Third Party Administrator, Accelerated Innovations, LLC as the Behavioral Program Implementer, and ADM Associates as the Third Party Evaluator.

Resolution No. R-17-31 dated January 26, 2017 approved these selections and required ENO to file an implementation plan for Program Years 7-9.

Pursuant to Resolution No. R-17-31, ENO filed its Supplemental Implementation and Cost Recovery Plan for Energy Smart Program Years 7-9. In resolution R-17-176, the Council approved the individual programs, with exception to the program budget level and utility incentive level.

Program Years 10-12

Council Resolution No. R-17-430 dated August 10, 2017 established Council Docket 17-03 for the 2018 IRP and also required ENO to make an implementation plan filing for Program Years 10-12. Subsequently the procedural schedule was updated via Hearing Officer Order dated March 26, 2018. On December 9, 2017 ENO filed its Implementation and Cost Recovery Plan for Energy Smart Program Years 10-12. Council resolution R-19-516 extended Program Year 9 such that PY9 covered 15 months (January 1, 2019- March 31, 2020). As a result, Program Year 10 was reduced to a 9 month program year. Council resolution R-20-51, dated February 20, 2020 approved the budget and goals for Program Years 10-12 and the PY9 extension period.

Program Years 13-15

In Council Resolution R-20-51, the Council agreed "that ENO should issue an RFP for the TPA and TPE functions for PY13 through 15[.]" Pursuant to that statement, ENO issued a RFP for the TPA and TPE functions for PY13-15 on December 21, 2021. Herein, ENO submits information regarding the RFP and the resulting selections for the Council's approval. In addition, on behalf of the proposed selections, ENO submits its Implementation Plan for Program Years 13-15. A summary description of the proposed programs is set forth below:

Residential

Home Performance with Energy Star ("HPwES") – 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. HPwES will offer 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 LEDs and water conservation measures. To generate additional savings at the time of the audit, demand response enabled smart thermostats have been added as a direct install measure. Level II Assessments are comprehensive home inspections with diagnostic testing, performed by a qualified contractor, 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, APTIM will include all buildings with four or fewer units in the HPwES offering. Structures of this size and construction type often behave more like single-family homes, with owners often occupying one of the units, thus minimizing the split-incentive barrier.

Building types with two to four units function more like single-family homes, with no or small amounts of common-area space.

Retail Lighting and Appliances - The objective of the Retail Lighting and Appliances 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 two main program activities include (1) retailer recruitment and merchandizing and (2) administration of the incentive process (including program tracking).

Multifamily Solutions - 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.

Income Qualified Weatherization – 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.

A/C Solutions - The A/C Solutions offering, formerly the High Efficiency AC Tune-Up program, 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 contractor 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. The A/C Solutions offering will be cross-promoted with the other residential offerings to encourage more comprehensive energy savings.

NOLA Wise School Kits & Education and Community Outreach – The NOLA Wise School Kit & Education 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.

Behavioral – The Behavioral offering will provide customers with a Home Energy Report (HER) through digital or print channels. Residential customers will receive a HER that compares them to similar and efficient households, shows their end-use energy consumption, provides personalized tips for saving energy, and directs them to other program offerings. The program design will include four paper HERs sent over the course of the year, as well as monthly digital HERs for those customers that have emails on file. Delivery of the reports will be timed to maximize energy savings around seasonal consumption peaking periods.

Appliance Recycling and Replacement Pilot – The Appliance Recycling and Replacement Pilot offering will encourage early recycling of low efficiency appliances, such as refrigerators and freezers, for residential customers. The Pilot 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. The pilot is projected to have 1,400-1,800 customer participants annually during this period.

Commercial and Industrial

Small Commercial & Industrial Solutions - The Small Commercial & Industrial Solutions offering will provide 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 will help small business customers analyze facility energy use and identify energy efficiency improvement projects. Program participants will be 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.

Large Commercial & Industrial Solutions - The primary objective of the Large Commercial and Industrial Solutions offering (Large C&I) 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 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, installation contractors and Energy Service Companies (ESCOs).

Commercial Real Estate - The primary objective of the new Commercial Real Estate (CRE) offering is to more deeply engage Class A and B office space which represents a major market sector within the large commercial building stock (greater than 100 kW demand) and contains significant energy savings potential. This market has a unique set of needs and decision makers, so a targeted approach is necessary to obtain strong engagement. This offering is only included in the second scenario.

Publicly Funded Institutions - The Publicly Funded Institutions 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.

Commercial & Industrial Construction Solutions - The new Commercial & Industrial Construction Solutions offering will encourage customers to design and construct higher efficiency facilities than building code 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.

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Demand Response

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Bring Your Own Thermostat ("BYOT") - The residential BYOT DR offering 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. Customers participating in the program will receive an incentive upon enrollment, as well as an ongoing annual incentive for continued participation in the program.

Peak Time Rebate Pilot - The Peak Time Rebate Pilot will engage customers to reduce energy consumption during Peak Events. The proposed Pilot allows ENO to call events year-round and will include customer engagement through email messaging. Email communications will notify customers when events are imminent and provide clear recommendations on how and when to reduce their energy consumption.

Electric Vehicle Bring Your Own Charger Pilot ("BYOC") – The BYOC pilot will seek to shift electric vehicle (EV) load to off-peak hours, when demands on the electric system are lowest. BYOC leverages existing investments in AMI smart meter infrastructure to monitor customer electric vehicle charging behavior. The program is open to any make or model of EV using any level 2 charger.

Large Commercial Automated Demand Response ("ADR") - The ADR program will seek to incentivize large commercial customers to allow ENO to reduce their usage during peak events. The ADR program will utilize automated controls to reduce usage by controlling lighting, HVAC and other machinery at large commercial facilities.

In conjunction with the Plan, ENO is also filing the attached implementation report, RFP report, and other attachments detailing the proposed programs.

In support of the request set forth herein, ENO submits this application for the extension of Energy Smart and the accompanying proposed budget.

WHEREFORE, ENO respectfully requests that this Council issue a Resolution:

Approving ENO's proposal for the implementation of the DSM programs as set forth herein through December 31, 2025;

Approving ENO's selections for Third Party Administrators and Third Party Evaluators for Program Years 13-15;

Approving the level of funding and associated kWh savings recommended for the programs;

Approving the continued use of the current UPI mechanism;

Approving the continued use of the current Energy Efficiency Recovery Rider for recovery of program costs;

Granting the opportunity to amend this implementation plan should material changes to expectations arise; and

Granting all other general and equitable relief that the law and the nature of this proceeding may permit or require.

Respectfully submitted:

BY: _____

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**ATTORNEYS FOR ENTERGY
NEW ORLEANS, LLC**

ENERGY SMART IMPLEMENTATION PLAN REPORT
FOR PROGRAM YEARS 13 THROUGH 15

IMPLEMENTATION PLAN REPORT FOR PROGRAM YEARS 13-15

     I.   **Executive Summary**

Currently in its twelfth program year, the Energy Smart program ("Energy Smart" or "Program"), is a resource for reducing energy usage for New Orleans' residents and business owners. Energy Smart is a comprehensive portfolio of residential and commercial energy efficiency ("EE") and demand response ("DR") programs that provide rebates and incentives for a wide range of energy efficiency measures. In its first 11 years, Energy Smart distributed more than $36 million in cash incentives and helped customers save more than 288 million kilowatt hours. Recognizing this success, the Department of Energy has awarded Energy Smart its Partner of the Year award four times, most recently in 2022.

All Entergy New Orleans ("ENO") customers are "opted in" to the Program and are eligible to access energy saving measures for their homes or businesses. In fact, many customers will be able to take advantage of energy saving measures at no, or low, out of pocket cost. Home assessments that gauge the available savings in a particular customer's home are free for all customers who request one. ENO conducts extensive efforts to inform customers through channels such as email, bill inserts, and social media. Further, ENO proactively contacts customers who are in arrears on their electric bills and who have experienced high electric bills to provide information and encourage participation.

Any expression of interest by a customer—such as an email, phone call, signup at an event, or inquiry to ENO staff— initiates the process of participating in Energy Smart. Many customers participate simply by purchasing marked down energy efficient products from local retailers. Thousands of customers are sent home energy reports monthly that help customers understand their usage and provide tips to help them save. ENO welcomes participation and involvement to produce the best customer experience in efforts to reduce energy usage. To the extent there are ideas for engaging customers who have not expressed interest, such as proactively scheduling home assessments and then notifying the customers of the pending inspections, ENO is open to discussing them so that all interested parties can consider possible implications of such approaches.

Helping income qualified customers has always been a vitally important part of Energy Smart. Over the last three years alone, the Program has helped 2,321 income qualified customers by installing energy savings measures in their homes and apartments at no cost to them. In many cases, these customers live in geographic areas of the city that are affected by heat islands or particularly severe energy burdens. As part of the stakeholder process around consideration of this PY 13-15 Implementation Plan, ENO looks forward to input that can help the Program reach other income qualified customers in such areas to help mitigate these hardships.

To publicize the Program and make customers aware of all the benefits they can receive from actively participating, Energy Smart implementers perform outreach, education, and workforce development for New Orleans area residents through multiple different channels:

- Implementers routinely represent Energy Smart at New Orleans fairs, festivals, and neighborhood association meetings, explaining the Program and encouraging customers to participate. Since 2019, Program personnel have attended over 320 events.
- Energy Smart personnel regularly set up at the ENO Care Center to speak with customers about the Program and encourage them to get started with a free Home Assessment.
- Personnel conduct hands-on workshops and other training sessions at organizations throughout the year, utilizing each organization's network to increase Program participation and visibility. Since 2019, Program personnel have conducted over 850 workshops and other trainings throughout the city.
- In 2021, Energy Smart was able to expand its workforce development to include apprenticeships for three local individuals.

This outreach by Energy Smart personnel, as well as ENO employees, is a critical part of the success of the Program. A summary of outreach events over the last four years is presented in the table below, which highlights the impact Covid-19 had on the Program's ability to contact potential participants. ENO is always interested in feedback that could help broaden the outreach efforts for the Program and looks forward to that dialogue during the Stakeholder process to review the PY13-15 plan.

2 years prior to COVID	2 years of COVID
PY8 Annual Report Community Outreach Summary	**PY10 Annual Report Community Outreach Summary**
• 159 events • 30,570 people reached	• 70 webinar events • 1,826 people reached
PY9 Annual Report Community Outreach Summary	**PY11 Annual Report Community Outreach Summary**
• 167 events • 46,430 people reached	• 107 events (in-person and virtual) • 7,663 people reached

As discussed in Section II, the proposed budgets for PY13-15 reflect the increased costs that are expected to be incurred in trying to stay on track to achieve the Council's .2/2% kWh savings goal. The main drivers of the increases are the enforcement of the Energy Independence & Security Act (EISA) Phase II standards beginning in June 2023 (discussed in detail in Attachment 2), as well as supply chain pressures affecting the prices of needed equipment.

II. Overview of the Energy Smart PY 13-15 Implementation Plan

   a. Recap of Program Year 10 ("PY10") and Program Year 11 ("PY11") Performance

Despite having performed well throughout its history, the Energy Smart Program has faced significant unforeseen challenges in the current triennial cycle. The Covid-19 pandemic caused the Program to shut down in-person assessments for several months during the beginning of PY10. By pivoting to garner kWh savings in new ways such as conducting virtual assessments and giving away energy efficiency products at New Orleans City Council ("Council") food distributions, the Program was able to attain 94% of the Council's goal. In 2021, worldwide labor shortages and materials shipping delays prevented the completion of many projects during PY11. Similar shipping delays are still hampering Program productivity today.

Hurricane Ida also had a significant effect on the Program's ability to hit kWh savings targets in PY11. Though the citywide power outage only lasted approximately 8 days, many residents and businesses were focused on recovery for months after the storm. The Program provided Hurricane Ida Relief Grants for energy efficiency projects that happened as a result of Hurricane Ida damage. This initiative helped spur an increase in projects, however the aforementioned material delays prevented some of the projects from being completed during PY11. As a result of these headwinds, the Program hit 75% of the Council-approved PY11 goal.

b. Request for Proposals and Bidder Selection

ENO issued a Request for Proposals ("RFP") on December 21, 2021 for Third Party Administrators ("TPA") and a Third Party Evaluator ("TPE") for PY13 – PY15. Please see Attachment 8 for a discussion of the RFP and the resulting selections. The table below lists the proposed program categories and corresponding selected implementers.

Type of Program	Selected Implementers
Energy Efficiency	Aptim
Residential BYOT Demand Response	Aptim/EnergyHub
NOLA Wise Schoolkits	National Theater for Children
Large Commercial Demand Response	Honeywell/Enbala (Generac)
Electric Vehicle Charger Demand Response	Sagewell
Evaluation, Measurement and Verification	ADM Associates

c. kWh Targets

In developing the Plan for PY13 through PY15, the Energy Smart team relied on historical results, future expectations and Program experience as well as findings from the two potential studies conducted by GDS and Guidehouse ("Potential Studies") for the ENO 2021 Integrated Resource Plan ("IRP"). The team first calculated the targets based upon the Council's stated goal to increase kWh savings targets by 0.2% (relative to total annual sales) until the target reaches 2.0% of total annual retail electric sales. The calculations were performed by taking the rolling average of Total Annual Sales for the three-year period preceding the years covered by the Implementation Plan. That rolling average of total annual sales is then used to determine the amount of kWh savings needed to increase the goal by 0.2% over the previous year. For the PY10-PY12 Implementation Plan, t the approved targets contained more aggressive goals than the 2.0% path than the 2.0% path, yielding targets that were 1.52% and 1.68% of total annual sales for PY11 and PY12, respectively.

	Total Annual kWh Sales
2016	5,735,914,000
2017	5,623,978,000
2018	5,916,322,000
3 Year Rolling Average	**5,758,738,000**

	kWh Targets	**% of Total Annual Sales**
PY11	87,511,515	1.52%
PY12	96,773,677	1.68%

With PY12's target at 1.68%, the goals for PY13-PY15 would be 1.88%, 2.0%, and 2.0% respectively. The 3-year rolling average for total annual sales for 2019-2021 is illustrated in the table below.

	Total Annual kWh Sales
2019	5,823,938,000
2020	5,449,556,000
2021	5,407,660,000
3 Year Rolling Average	**5,560,384,667**

Applying the targeted percentages to the three-year rolling average (2019-2021) of total annual sales yields the goals in the table below.

	kWh Targets	% of Total Annual Sales
PY13	104,535,232	1.88%
PY14	111,207,693	2.00%
PY15	111,207,693	2.00%

d. kW Reduction Targets

Through the first 12 years of Energy Smart, the Council has only set targeted savings goals for energy (kWh) reductions, not for demand (kW) reduction. Given the growth in ENO's demand response ("DR") portfolio, ENO is looking forward to working with stakeholders to determine demand reduction goals based on the demand reduction projections in this Implementation Plan.

e. Proposed Programs

The Energy Smart team is proposing to include the following suite of programs for PY13-PY15:

Energy Efficiency

- **Residential**
  - Home Performance with Energy Star ("HPwES")
  - Retail Lighting and Appliances
  - Multifamily Solutions
  - Income-Qualified Weatherization
  - A/C Solutions
  - Appliance Recycling & Replacement
  - Schoolkits, Education, and Community Outreach
  - Behavioral Energy Efficiency
- **Commercial and Industrial**
  - Small Commercial & Industrial Solutions
  - Large Commercial & Industrial Solutions
  - Publicly Funded Institutions
  - Commercial & Industrial Construction Solutions

For a more in-depth discussion of the proposed EE programs, please see Attachment 2.

Demand Response

- **Residential**
  - Bring Your Own Thermostat ("BYOT")
  - Peak Time Rebate Pilot
  - Electric Vehicle Bring Your Own Charger Pilot ("BYOC")
- **Large Commercial**
  - Large Commercial Automated Demand Response ("ADR")

For detailed discussion on the proposed demand response programs, please see Attachments 4, 4a, 5, 6, and 6a

f. Proposed Budgets

The proposed budgets and associated savings goals for the EE and DR offerings are listed in the tables below.

Program Year 13			
Energy Efficiency Program	**Program Cost**	**kWh**	**kW**
Small C&I Solutions	$ 1,105,876	4,925,994	949
Large C&I Solutions	$ 7,221,219	35,008,874	6,475
Publicly Funded Institutions	$ 2,616,243	10,799,767	409
C&I Construction Solutions	$ 898,381	3,512,971	806
Home Performance with Energy Star ("HPwES")	$ 2,533,365	16,461,506	883
Retail Lighting and Appliances	$ 1,632,415	7,997,811	1,110
Multifamily Solutions	$ 977,320	2,678,475	142
Income Qualified Weatherization	$ 2,544,729	3,817,679	108
A/C Solutions	$ 1,223,882	2,848,496	1,239
Appliance Recycling & Replacement	$ 559,357	1,701,810	25
School Kits & Education and Community Outreach	$ 319,682	797,088	107
Behavioral	$ 607,174	14,067,914	-
Energy Efficiency Subtotal	**$ 22,239,643**		
Demand Response Program	**Program Cost**	**kWh**	**kW**
Residential Peak Time Rebate Pilot	$ 276,920	-	714
Residential - BYOT	$ 923,098	-	9,600
Large C&I DR	$ 914,821	-	6,970
Bring Your Own Charger (BYOC) Pilot	$ 198,756	-	525
Demand Response Subtotal	**$2,313,596**		
TOTAL	**$ 24,553,239**	**104,618,385**	**30,061**

Program Year 14			
Energy Efficiency Program	**Program Cost**	**kWh**	**kW**
Small C&I Solutions	$ 1,454,957	6,349,948	1,112
Large C&I Solutions	$ 9,163,958	45,589,079	7,291
Publicly Funded Institutions	$ 3,600,302	15,730,841	397
C&I Construction Solutions	$ 991,962	4,301,994	987
Home Performance with Energy Star ("HPwES")	$ 1,791,010	3,404,313	966
Retail Lighting and Appliances	$ 1,125,629	1,558,999	16
Multifamily Solutions	$ 1,000,035	2,526,471	145
Income Qualified Weatherization	$ 2,395,956	3,220,972	66
A/C Solutions	$ 1,498,799	3,322,555	1,453
Appliance Recycling & Replacement	$ 581,634	1,785,774	26
School Kits & Education and Community Outreach	$ 319,682	797,089	107
Behavioral	$ 507,224	19,186,619	-
Energy Efficiency Subtotal	**$ 24,431,148**		

Demand Response Program	Program Cost	kWh	kW
Residential Peak Time Rebate Pilot	$ 246,253	-	998
Residential - BYOT	$ 961,380	-	11,600
Large C&I DR	$ 782,004	-	8,870
Bring Your Own Charger (BYOC) Pilot	$ 258,550	-	1,125
Demand Response Subtotal	**$ 2,248,187**		
TOTAL	**$ 26,679,335**	**107,774,655**	**35,159**

Program Year 15			
Energy Efficiency Program	**Program Cost**	**kWh**	**kW**
Small C&I Solutions	$ 1,678,839	6,846,039	1,331
Large C&I Solutions	$ 9,647,151	47,767,306	7,780
Publicly Funded Institutions	$ 3,716,628	15,981,018	491
C&I Construction Solutions	$ 1,076,216	5,000,235	1,147
Home Performance with Energy Star ("HPwES")	$ 1,553,945	2,392,127	898
Retail Lighting and Appliances	$ 1,175,752	1,587,308	16
Multifamily Solutions	$ 939,819	2,402,578	139
Income Qualified Weatherization	$ 2,328,717	2,989,692	32
A/C Solutions	$ 1,750,005	3,651,365	1,602
Appliance Recycling & Replacement	$ 613,502	1,917,201	28
School Kits & Education and Community Outreach	$ 319,682	797,089	107
Behavioral	$ 517,597	20,051,684	-
Energy Efficiency Subtotal	**$ 25,317,853**		
Demand Response Program	**Program Cost**	**kWh**	**kW**
Residential Peak Time Rebate Pilot	$ 264,649	-	1,254
Residential - BYOT	$ 1,078,428	-	13,600
Large C&I DR	$ 846,069	-	10,470
Bring Your Own Charger (BYOC) Pilot	$ 338,803	-	1,575
Demand Response Subtotal	**$ 2,527,949**		
TOTAL	**$ 27,845,802**	**111,383,642**	**40,470**

A comparison of the proposed kWh targets and the 0.2/2% path kWh targets is in the table below.

	2% kWh Targets	Implementation Plan Proposed Targets	Percentage
PY13	104,535,232	104,618,385	100.1%
PY14	111,207,693	107,774,655	96.9%
PY15	111,207,693	111,383,642	100.2%

The recent announcement of the EISA Phase II standards enforcement schedule will have significant impacts on the portfolio's potential. These impacts were not included in previous potential studies and program plans that were developed prior to the recent EISA enforcement decisions. As a result, this proposed plan shows a regression in savings for PY14, relative to the 0.2% annual, incremental growth goal. Recovery is planned for PY15, when multiple initiatives will enable the program to recover from the EISA impacts and target the 2.0% annual kWh savings goal in that year. A more thorough discussion of EISA Phase II Standards can be found in Attachment 2.

g.   Evaluation, Measurement & Verification ("EM&V")

EM&V is included in the above tables at 4.0% of the total program costs. A detailed discussion of proposed EM&V activities for PY13-15 can be found in Attachment 7.

h.   Performance Incentive and Lost Contribution to Fixed Costs ("LCFC")

Council Resolution R-20-51 established the current utility performance incentive ("UPI") mechanism. The mechanism allows ENO to begin earning an incentive when 95% of the Council's approved annual kWh goal is reached. At 100% of the approved goal, ENO would earn an incentive equal to 7% of the approved total program costs. The mechanism allows for increased incentives for achieving up to 120% of the approved goal.

The majority of ENO's proposed programs include tangible measures that can be tracked throughout the year to monitor the effectiveness of the program. The Behavioral program, however, is not fully evaluated until after the program year is completed, leaving ENO without the opportunity to react if the program is not on target to reach its goal. ENO and ADM have instituted midyear evaluations to mitigate the risk of not knowing how well the program is performing. Even with midyear evaluations, there is still substantial risk that the program year will have ended before ENO is aware of deficiencies in kWh savings associated with the Behavioral program. As such, ENO proposes that, while the kWh savings associated with the Behavioral program should count towards the Council's 2.0% goal, the results of the Behavioral program should not be included in the UPI calculation.

In summary, ENO proposes that the current UPI mechanism remain applicable for PY13-PY15, but that the Behavioral program's budget and evaluated kWh savings be excluded from the UPI calculation. Should a demand reduction goal be established, ENO recommends that a UPI mechanism that mirrors the current EE mechanism be applied to DR. For LCFC, ENO proposes to maintain the current LCFC calculation methodology.

The table below illustrates the amount of UPI that ENO would earn for achieving 100% of the proposed targets if the Behavioral program is excluded from the calculation.

| | Excluding Behavioral | | | |
	EE Program Costs	UPI at 100% of Goal	Projected kWh Savings	LCFC @ 100% of Goal
Program Year 13	$ 21,632,469	$ 1,514,273	104,618,390	$ 7,522,062
Program Year 14	$ 23,923,924	$ 1,674,675	107,774,640	$ 7,748,997
Program Year 15	$ 24,800,256	$ 1,736,018	111,383,640	$ 8,008,484

The table below illustrates the amount of UPI that ENO would earn for achieving 100% of the proposed targets if the Behavioral program is included from the calculation.

	Including Behavioral			
	EE Program Costs	UPI at 100% of Goal	Projected kWh Savings	LCFC @ 100% of Goal
Program Year 13	$ 22,239,643	$ 1,556,775	104,618,390	$ 7,522,062
Program Year 14	$ 24,431,148	$ 1,710,180	107,774,640	$ 7,748,997
Program Year 15	$ 25,317,853	$ 1,772,250	111,383,640	$ 8,008,484

III.   Cost Recovery

ENO proposes that program costs and UPI continue to be recovered through the Energy Efficiency Cost Recovery ("EECR") rider.

IV.   Typical Bill Impact

The estimated typical bill impact for customers based on their rate class is shown in the table below.

ENO Typical Monthly Bill Impacts			
	PY 13	PY 14	PY 15
Typical Bill Impact (1,000 kWh residential customer)	$ 5.47	$ 4.96	$ 5.05
Typical Bill Impact (9,125 kWh commercial customer)	$ 16.01	$ 21.16	$ 24.13
Typical Bill Impact (91,250 kWh industrial customer)	$ 564.55	$ 703.64	$ 740.01

entergy

January 1, 2023 – December 31, 2025
Program Years 13, 14 and 15
Energy Smart Energy Efficiency
Demand Side Management Plan

07/29/2022

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Contents

Entergy New Orleans, LLC (ENO) selected Aptim Environmental & Infrastructure, LLC (APTIM) as the Third-Party Administrator (TPA) to deliver the Energy Smart portfolio of demand side management programs for the period of January 1, 2023 to December 31, 2025. APTIM will be retained by ENO to implement, deliver, administer and conduct Quality Control/Quality Assurance (QC/QA) and some measurement and evaluation of the energy conservation and demand side management programs as approved by the Council for the City of New Orleans (Council). The Energy Efficiency (EE) plan outlined in this document details the proposed design, budgets, and savings targets for the Energy Smart portfolio in Program Years 13, 14 and 15 which run from January 1, 2023 to December 31, 2025.

The APTIM team completed the analysis and recommendations detailed in this implementation plan utilizing historical participation results, market potential studies and best practices of energy efficiency programs. While plan inputs were considered from the 2021 Demand Side Management Potential Studies performed by GDS Associates and Guidehouse Inc., the proposed program designs incorporate several factors not included in the potential studies that have substantial impact over the three-year program cycle. Energy Independence and Security Act (EISA) Phase II standard enforcement, the recent spike in inflation, trade ally contractor labor shortages, and supply chain delays represent noteworthy challenges during the next program cycle. This implementation plan provides aggressive, yet achievable program savings targets that provide significant benefits to ENO's customers.

The following table shows the legacy program offerings from Program Years 10-12 relative to the proposed new offerings for Program Years 13-15, with more details on each offering included within this plan.

PORTFOLIO	PY 10-12 PROGRAM OFFERINGS	PY 13-15 PROGRAM OFFERINGS
RESIDENTIAL	Home Performance with Energy Star ("HPwES")	Home Performance with Energy Star ("HPwES")
	Retail Lighting and Appliances	Retail Lighting and Appliances
	Multifamily Solutions	Multifamily Solutions
	Income Qualified Weatherization	Income Qualified Weatherization
	A/C Solutions	A/C Solutions
	Appliance Recycling & Replacement Pilot	Appliance Recycling & Replacement Pilot
	NOLA Wise School Kit and Community Outreach Program	NOLA Wise School Kit and Community Outreach Program
	Behavioral Program	Behavioral Program
	Rewards	N/A
COMMERCIAL & INDUSTRIAL	Small Commercial & Industrial Solutions	Small Commercial & Industrial Solutions
	Large Commercial & Industrial Solutions	Large Commercial & Industrial Solutions
	Publicly Funded Institutions	Publicly Funded Institutions
	Commercial & Industrial Construction Solutions	Commercial & Industrial Construction Solutions

In Program Years 13-15 APTIM will continue to work with ENO, the Council and Advisors (Advisors), as well as other stakeholders to ensure continuous progression and evolution of the Energy Smart program. In considering the future shape of the portfolio, the APTIM Team has planned pilots and initiatives that will carry the program portfolio into the future. The team has carefully considered and prioritized program improvements across the board that add operational efficiencies to program delivery, introduce pilots and initiatives that reach unmet needs. APTIM will continually consider ENO's plans and priorities, stakeholder feedback, commercial availability of technology, and offerings that are realistic given each program's maturity in the market.

The following implementation plan provides additional detail on the program designs, savings targets, budgets, and innovative enhancements of the Energy Smart program. The APTIM team will leverage our knowledge to identify and introduce innovative, value-added approaches.

1. Residential Offerings

The proposed programs included within APTIM's Residential portfolio are included with information on innovations and enhancements for consideration during implementation of the 2023-2025 Energy Smart EE portfolio. The proposed program design incorporates the 2007 EISA Phase II standards, which take full effect in PY13 and significantly alter the Retail Lighting and Appliances program in PY14 and PY15.

The Residential portfolio provides a comprehensive and wholistic approach in helping all of ENO's residential customers make smart energy decisions. The programs proposed offer solutions at all levels for residential consumers – from the shopper purchasing a rebated smart thermostat online, to the homeowner prepared to make a long-term investment in their home's energy performance.

Home Performance with Energy Star ("HPwES") – This offering takes a whole-house approach to improving energy efficiency. Energy Smart certified Energy Advisors help residential customers analyze their energy use and identify and complete comprehensive energy efficiency upgrades. 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 can also be offered as a "virtual assessment" in which customer will video chat with an Energy Advisor in which the customer walks them (virtually) through their home to perform the audit. Upon completion of the virtual audit, a customized kit containing the eligible low-cost measures will be delivered to the customer's home. The home energy assessment may recommend follow-up measures which require diagnostic testing targeted 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, APTIM will include all buildings with four or fewer units in the HPwES offering. Structures of this size and construction type often behave more like single-family homes, with owners often occupying one of the units, thus minimizing the split-incentive barrier.

Proposed ideas for continuations, enhancements and expansions to the HPwES offering include:

- Continue to provide the assessment self-scheduling tool available to customers through the Energy Smart website. This tool will also be used by Energy Wise, the local non-profit partner supporting community outreach for the Energy Smart program.
- Improve trade ally dispatching by providing trade ally portal for all job listings. Trade allies will accept or reject assigned jobs which will increase speed of trade ally response to customers and improve customer satisfaction with speed of service.
- Enhance virtual audit tool with multiple participation paths including self-assessment and kit only; self-assessment, kit, and virtual audit; self- assessment, in-home audit, and direct install. These improvements will provide a more seamless customer experience with a user-friendly interface that will likely increase the volume of participation for this offering.
- Utilize GIS mapping to identify areas of Orleans Parish experiencing greatest consequences of heat island effect to target program outreach.

Retail Lighting and Appliances - The objective of the Retail Lighting and Appliances offering is to increase awareness and sales of efficient lighting and appliances to ENO's residential population. The Online Marketplace was introduced to the Retail program last program cycle and will continue to provide an opportunity for customers to access instant rebates for online purchases of energy efficient equipment including smart thermostats, advanced power strips, pipe insulation, water savers and LED fixtures. The Retail offering provides customers the opportunity to purchase a variety of discounted products that are ENERGY STAR qualified or better including refrigerators, window air conditioners, heat pump water heaters, dehumidifiers, and pool pumps. Participating retailers include national partners, like The Home Depot, as well as local partners, like the Green Project, to achieve a blend of large and small retailers.

Proposed ideas for continuations, enhancements and expansions for the Retail Lighting and Appliances offering include:

- Retail program emphasis will shift from LED lighting to appliances beginning mid-2023 as EISA standards are realized in store lighting stock.
- Expand the in-store marketing to include non-lighting products, such as smart thermostats, refrigerators, freezers, dehumidifiers, and air purifiers.
- Cross-promote retail smart thermostat signage with Demand Response (DR) program to increase conversion of smart thermostat purchases into DR enrollments.
- Offer pre-enrollment into DR programs for smart thermostats purchased on program Online Marketplace.

- Upgrade Online Marketplace platform design to add configurations that improve overall customer experience, such as customer-care team chat feature.

Multifamily Solutions - 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. Direct install measures include LED light bulbs, water-saving showerheads, faucet aerators and smart thermostats. 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.

Proposed ideas for continuations, enhancements and expansions for the Multifamily Solutions offering include:
- The program team will partner with the Apartment Association of Greater New Orleans (AAGNO) to foster ongoing communication with associations to drive additional participation outside of annual events.
- Increase coordination and initiatives with Louisiana Housing Corporation (LHC), Housing Authority of New Orleans (HANO) and Greater New Orleans Housing Alliance (GNOHA) to reach affordable housing more effectively.
- Engage Energy Wise, the programs local non-profit outreach partner, to better serve multifamily properties with low-income tenants, including work with VIET (Vietnamese Initiatives in Economic Training) and TCA (Total Community Action).
- Add content for customer education including an educational video that customers can view after installation has been completed to re-educate them on the new technologies and allow them to learn more. The team will explore developing the video in multiple languages for non-English speaking residents.

Income-Qualified Weatherization – The Income-Qualified Weatherization offering is designed to offer qualifying customers no-cost participation in the whole-house approach of the Home Performance with ENERGY STAR program. APTIM and program partners work to identify and qualify customers for participation. Energy Smart certified Energy Advisors help customers analyze their energy use and provide direct installation of energy efficient equipment such as LED bulbs, water savings measures, and smart thermostats. Follow-up measures are completed by an Energy Smart approved trade ally at no cost to the income-qualified customer, including attic insulation, air conditioning tune-up, air sealing, and duct sealing.

Proposed ideas for continuation, enhancements and expansions for the Income-Qualified Weatherization offering include:

- Create stakeholder working group to coordinate program access for customers in need with Total Community Action (TCA), Low-Income Home Energy Assistance Program (LIHEAP), Weatherization Assistance Program (WAP), Alliance for Affordable Energy, Energy Wise and other community-based organizations.

- Utilize GIS mapping with census tract data to identify areas of Orleans Parish with the highest energy burden to target program outreach.
- Continue to work with Energy Wise to generate awareness of and participation in the program. This includes program information tables at neighborhood pop-up events, Entergy Walk-In Payment Centers, and working with organizations such as food banks and other assistance programs.

A/C Solutions - The A/C Solutions offering will provide residential customers with a comprehensive set of options to help lower the energy consumption associated with keeping their homes cool and comfortable in the summer. In addition to tune-ups and high efficiency replacements, A/C Solutions will offer duct sealing and smart thermostat measures. The program will enhance the ability within the territory's HVAC contractor network to provide value-added services to its customers. These services are eligible to be incentivized because they surpass the standard industry practices and offerings in the marketplace. The A/C Solutions offering will be cross promoted with the other residential offerings to encourage more comprehensive energy savings.

Proposed ideas for continuations, enhancements and expansions to the A/C Solutions offering include:
- Cross-market the Demand Response offerings to participants in A/C Solutions through participating HVAC contractors.
- Significantly increase HVAC replacement incentives to cover a greater portion of the project cost for end-of-life replacements when upgrading to a high efficiency unit.
- Introduce mid-stream incentive opportunities for local distributors of high efficiency HVAC units.

Appliance Recycling & Replacement - The Appliance Recycling and Replacement offering was provided as a pilot program in the previous cycle. The offering will encourage early recycling of low efficiency refrigerator and freezers for residential customers. The offering will include a refrigerator replacement option for income-qualified residential customers. The replacement refrigerator provided by the program will be a standard sized model, ENERGY STAR certified and ADA-compliant. This offering will go beyond federal recycling requirements using environmentally friendly best practices for recycling all components of each appliance.

Proposed ideas for continuations, enhancements and expansions to the Appliance Recycling & Replacement offering include:
- Introduce mid-stream incentive opportunities for local second-hand retailers of used appliances to keep the highest energy using appliances off of the grid.
- Explore including dehumidifier and window air conditioners to the appliance available for home pick-up.
- Increase program cross-promotion, direct marketing tactics, and community outreach to drive program participation.

School Kits, Education and Community Outreach – The National Theatre for Children (NTC), in coordination with ENO, will recruit, enroll, deliver energy efficiency curriculum and disperse school kits to 4,100 students each year and secure installation to ENO residences to promote behavior change and create lifelong energy-smart ENO customers.

Community Outreach: Energy Wise, a local non-profit, supports community outreach for the entire portfolio. They support in-person events and resource fairs with information table and Home Energy Assessment self-scheduling.

Behavioral Energy Efficiency– The Behavioral offering will provide customers with a Home Energy Report (HER) through digital or print channels. Residential customers will receive a HER that compares them to similar and efficient households, shows their end-use energy consumption, provides personalized tips for saving energy, and directs them to other program offerings. The program design will include four paper HERs sent over the course of the year, as well as monthly digital HERs for those customers that have emails on file. Delivery of the reports will be timed to maximize energy savings around seasonal consumption peaking periods.

Home Energy Reports in previous program cycles utilized billing data for report analysis. The Behavioral Energy Efficiency offering in this cycle leverages AMI data and the actual disaggregation of each customer's unique energy profile to elicit savings that are personally achievable and impactful for each recipient. By design, each report includes personalized energy insights such as appliance-level energy consumption breakdowns to help customers better understand and manage their energy usage. This report will also educate customers on the impact of their consumption on their bills. In addition, the Home Energy Reports allow for the provision of suggested program offerings that are also applicable to the recipient (e.g., Demand Response).

The program will use an Energy Smart-branded, mobile-responsive customer engagement portal that contains a broad set of features to serve customer needs. The portal gives customers the ability to understand how their usage translates to spending, why their bills have increased or decreased and what action(s) to take to meet their goals. All of this information is accessible with a single click within an electronic HER and no additional login. Customers who are not receiving emails can access the web portal via Single Sign-On (SSO) from their ENO portal. Quarterly printed HERs will be mailed to a subset of eligible customers.

KEY FIGURES	YEAR 13	YEAR 14	YEAR 15	PROGRAM AVERAGES
Legacy Participants	46,788	42,100	37,890	42,256
Projected New Participants	67,317	84,628	100,207	84,051
Projected Print Participants	65,823	59,241	53,317	59,460
Projected Digital Participants	48,272	67,487	84,780	66,847
Projected Annual MWh Savings	14,066	19,185	20,058	17,769
Treatment Customers (annual average)	114,095	126,728	138,097	126,307

2. Commercial & Industrial Offerings

The proposed offerings included within APTIM's Commercial and Industrial portfolio are provided below along with information on innovations and enhancements for consideration during implementation of the 2023-2025 Energy Smart EE portfolio. The program designs align with the programs discussed in the 2021 Demand Side Management Potential Studies performed by GDS Associates and Guidehouse Inc. The C&I portfolio will offer prescriptive offerings, making it easier for customers and trade allies to participate, while increasing overall cost-effectiveness of the C&I portfolio. Incentives and savings for prescriptive measures are based primarily on measures in the New Orleans Technical Reference Manual (TRM). For all offerings, APTIM will facilitate feedback sessions involving ENO, members of our Trade Ally Advisory Group (TAAG), and other stakeholders to identify and evaluate innovative options for program enhancement throughout the PY 13-15 cycle.

Small Commercial & Industrial Solutions - The Small Commercial & Industrial Solutions offering will provide 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 will help small business customers analyze facility energy use and identify energy efficiency improvement projects. Program participants will be 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.

Proposed ideas for continuations, enhancements and expansions to the Small Commercial and Industrial Solutions offering include:

- Expand the current list of trade allies participating in the Small Business Direct Install offering by supporting aggressive recruitment efforts.
- Formalizing pipeline of small commercial customer leads for network of Small Business Direct Install trade ally network.
- Utilize a Small Commercial Outreach Analyst to conduct targeted and consistent outreach to small business customers including cold calls, onsite informational meetings, walk-through assessments to identify energy efficient potential projects, and one-on-one Energy Smart application assistance.
- Implement a lighting direct install offering utilizing a simple web-based application process in which small business customers can sign up for direct install services on the Energy Smart website.
- Increase targeted marketing to promote non-lighting measures with no or low upfront cost including AC tune-ups, smart thermostats and refrigeration measures.
- Expand current outreach to churches/places of worship to raise awareness of the Energy Smart program amongst congregation.
- Increase prescriptive incentives to make it easier for customers and trade allies to estimate program incentives and participate in program offerings.
- Increase the cost-effectiveness of program delivery with a focus on non-lighting measures such as refrigeration, ENERGY STAR cooking equipment and high efficiency HVAC upgrades.
- Partner with the New Orleans Chamber of Commerce to promote Energy Smart offerings to new and existing chamber members.

- Facilitate trade ally coordination and partnerships to expand services to small commercial customers.
- Engage with City leadership including the Mayor's Office, Office of Economic Development and City Council to promote Energy Smart to small businesses and raise awareness of the program.
- Integrate Energy Smart offerings into existing processes and procedures at Entergy New Orleans including the Customer Service Department and Region Engineering Department to engage with customers adding or expanding load.

Large Commercial & Industrial Solutions - The primary objective of the Large Commercial and Industrial Solutions offering (Large C&I) 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 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, installation contractors and Energy Service Companies (ESCOs).

Proposed ideas for continuations, enhancements and expansions for the Large Commercial & Industrial Solutions offering include:
- Increase the number of prescriptive incentive offerings to make it easier for customers and trade allies to estimate program incentives and participate in program offerings.
- Increase incentive rates to offset negative effects of inflation and delay in supply chain and equipment delivery.
- Promote Building Automation System upgrades and retro-commissioning (RCx) projects to mid-sized facilities. These measures offer attractive paybacks and are historically promoted to larger facilities such as hospitals and universities.
- Increase the cost-effectiveness of program delivery with a focus on non-lighting measures such as window film, retro-commissioning and HVAC upgrades/optimization.
- Partner with the New Orleans Chamber of Commerce to promote Energy Smart offerings to new and existing chamber members.
- Facilitate trade ally coordination and partnerships to expand services Large C&I customers.
- Engage with City leadership including the Mayor's Office, Office of Economic Development and City Council to promote Energy Smart to all Large C&I customers throughout the ENO service territory.
- Integrate Energy Smart offerings into existing processes and procedures at Entergy New Orleans including the Customer Service Department and Region Engineering Department to engage with customers adding or expanding load.
- Expand support for Large C&I customers to include connection to LSU Industrial Assessment Center to provide energy audit and identify energy efficiency measure opportunities.
- Provide no-cost services for Large C&I customers including benchmarking analysis and Energy Smart application assistance.

- Engage with procurement officials for large customers such as the Convention Center, Sewerage and Water Board, and Regional Transit Authority to include Energy Smart in procurement language for new projects.

Publicly Funded Institutions - The Publicly Funded Institutions (PFI) 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. Customers will be given guidance throughout their engagement with the program.

Proposed ideas for continuations, enhancements and expansions for the Publicly Funded Institutions offering include:

- Increase the number of prescriptive incentive offerings to make it easier for customers and trade allies to estimate program incentives and participate in program offerings.
- Increase the cost-effectiveness of program delivery with a focus on non-lighting measures such as window film, retro-commissioning and HVAC upgrades/optimization.
- Engage with procurement officials and City leadership including the Mayor's Office and City Council to requite Energy Smart participation in the bid process for qualifying capital projects.
- Facilitate trade ally coordination and partnerships to expand services to PFI customers.
- Facilitate a PFI Cohort group to review previously completed Energy Smart projects, learn best practices and discuss ideas for program improvement.
- Create a cohort group of higher education students and student-led committees, such as Sustainability Committees, to increase engagement of higher education institutions and lead to a higher level of awareness of the Energy Smart program.

Commercial & Industrial Construction Solutions - The Commercial & Industrial Construction Solutions offering will encourage customers to design and construct higher efficiency facilities than building code or planned designs. This offering will be available to ground-up construction, additions or expansions, gut rehabs, building repurposing and commercial building restorations. The Commercial & Industrial Constructions Solutions offering will provide incentives for prescriptive and custom measures as well as a separate incentive track for whole building performance which is available for projects that perform energy modeling.

Proposed ideas for continuations, enhancements and expansions of the Commercial & Industrial Construction Solutions offering include:

- Expand recruitment and training efforts for construction and architectural firms in order to capture a larger share of projects that qualify for Commercial & Industrial Construction Solutions incentives.
- Coordinate with Entergy's Region Engineering Department to receive notifications when C&I customers submit documents for new load associated with ground-up new

construction or rehab projects.
- Utilize building permit report analytics to identify potential Construction Solutions projects, new trade allies and customer contacts.

Background and Overview

The following provide additional detail on the approach and background of the proposed program designs, budgets, and savings targets included in this implementation plan.

1. *Plan to Save 2% of Annual Sales*

   This proposed plan includes energy savings and budget forecasts that seeks to align with the Council's recommendation in Resolution R-17-30 that ENO provide a scenario that would increase kWh savings by .2% annually until a goal of 2% annual kWh savings is achieved. However, the recent announcement of the EISA Phase II standards enforcement schedule will have significant impacts on the portfolio's potential. These impacts were not included in previous potential studies and program plans that were developed prior to the recent EISA enforcement decisions. As a result, this proposed plan shows a regression in savings for PY14, relative to the 0.2% annual, incremental growth goal. Recovery is planned for PY15, when multiple initiatives will enable the program to recover from the EISA impacts and target the 2.0% annual kWh savings goal in that year.

2. *EISA Phase II Standards*

   The proposed program design incorporates the Energy Independence & Security Act (EISA) Phase II standards, which will be fully enforced in PY13. On April 26, 2022, the Department of Energy issued an Enforcement Policy Statement indicating an accelerated timeline for implementation of the new General Service Lamps (GSLs) efficiency standards. The enforcement timeline pertains to two rules issued by the DOE including expanded definition of GSL to include majority of screw-based lighting products and imposing a 45 lumen per watt minimum efficiency requirement for all GSLs. Combined, these rules will eliminate nearly all A-line, reflector, and specialty incandescent and halogen products from the market, and in turn change the baseline equipment for Energy Smart savings calculations. APTIM has confirmed with the Program Evaluator this precludes savings from being claimed in most circumstances for Retail Lighting, New Construction, and kit distribution channels. Reduced savings will still be realized (and claimed) in the program through early replacement and direct installation where existing incandescent, halogen and CFL bulbs can be recorded.

   The EISA ruling has substantial direct impacts on the Energy Smart Program. All measures addressing GSLs are affected by the ruling with reduced savings in PY13-14 and elimination from the portfolio in PY15. Beginning July 1, 2023, the Retail Lighting & Appliances program will no longer provide rebates to offset the cost of LED bulbs in retail stores. Lighting savings accounted for 13.5 M kWh (87%) of the Retail Lighting and Appliances program in PY11. Instead, the program will focus on ENERGY STAR appliances, smart thermostats and other equipment offered on the Online Marketplace at a significantly higher cost per kWh than retail lighting has historically performed.

There are likely to be substantial indirect impacts from the EISA ruling. The Energy Smart team anticipates that the reduction and elimination of measures involving GSLs will reduce contact points between the Energy Smart Program, trade allies and Entergy customers. LED retrofit projects often serve as customers' first exposure to the Energy Smart program and often lead to additional non-lighting efficiency projects. Reducing or eliminating lighting projects therefore reduce program participation generally. The loss of relatively low cost and high impact of LED retrofit projects also impacts program- and portfolio-level cost effectiveness, which leads to unfavorable impacts metrics such as Total Resource Cost.

Neither potential study accounts for the impacts of the advanced EISA enforcement schedule ruling issued by the US DOE in April 2022. However, the proposed program design incorporates multiple initiatives to help ensure the portfolio-level goal equating to 2% of retail sales will be reached in PY15.

3. *TRM Development and Evaluation Coordination*
   The planning inputs used to derive the savings and budget estimates within this implementation plan were created using national energy efficiency best practices, past participation, potential studies and through coordination with the existing Evaluation, Measurement and Verification (EM&V) consultant for the Energy Smart programs. The savings are based on assumptions from the available New Orleans Technical Reference Manual (TRM) and modified assumptions from the Arkansas TRM, in areas where data was not available in the New Orleans TRM.

   The APTIM team will continue to coordinate with the EM&V consultant during the planning phase and throughout the Program Years 13-15 program cycle. The team will make ongoing updates to savings methodologies and tools to comply with the New Orleans TRM updates and ensure that energy savings can be claimed for new measures where sufficient supporting documentation can be provided.

4. *Evaluation Measurement and Verification (EM&V) Budget*
   The budgets outlined within this plan include an allocation toward EM&V, which totals 4% of the annual budget for the relevant offerings.

5. *Budget Flexibility*
   The APTIM Team's experience has shown that program implementation often occurs at different rates for different programs, and that these implementation rates can vary significantly from predictions in program applications that formed the basis for program approval. For this reason, it is important that there continues to be budget flexibility within each rate class.

   Additionally, with the incorporation of new offerings and design elements, APTIM requests a process to request approval for budget flexibility between program years for the identified programs based on success of programs and design changes within the market.

6. Marketing Planning and Strategy

In advance of each program year, APTIM will develop a Marketing Plan (Plan) to map out umbrella marketing initiatives for the full program year ahead. Program level plans will be developed using an integrated multi-channel approach, interacting with customers via multiple channels, deepening the impact of individual tactics. Included within the Plan will be full-year marketing engagement calendars that will serve as the basis for campaign-level coordination for program staff at ENO, APTIM and program partner marketing teams.

The marketing tactics and channels employed for Energy Smart will continue to include:

Direct to Customer/trade allies
- Bill Inserts
- Case Studies
- Digital Advertising
- Direct Mailers
- Education and Training
- Email
- Incentive Applications
- Newsletters
- Program Fact Sheets
- Social Media Content
- Trade Ally Portal
- Website Content

Brand Awareness and Program Recognition
- Applications for Industry Awards
- Articles for Newsletters and Industry Publications
- Cross Promotion of Programs
- Customer/trade ally Recognition
- Earned Media
- Industry Event Participation
- Memberships and Sponsorships
- Partnerships with Industry Associations and Organizations
- Press Releases
- Conference Presentation/Abstracts
- Social Media Engagement
- Workforce Development

The Plan will detail the innovative programmatic approach to meeting annual savings goals, furthering awareness of the program and ensuring the delivery of the right message to the right audience at the right time. During the next program cycle the team will increase focus on brand awareness. Additional brand awareness tactics to be utilized PY13-PY15 will include guest blogging, E-newsletter content, out of home/guerilla marketing (billboards, bus shelters/wraps, street art) and brand ambassadors. The APTIM Team will also propose a co-campaign promoting Energy Smart with the New Orleans City Council. Working together to undertake joint promotional efforts will result in program validation, high-quality content and larger audience and demographical reach.

Portfolio Budgets and Savings

The APTIM team developed the following budgets and savings estimates detailed in this implementation plan utilizing historical results and best practices of energy efficiency programs to provide aggressive, yet achievable program savings targets that provide significant benefits to ENO's customers.

ENERGY SMART - DSM PORTFOLIO BUDGETS			
	Year 13	**Year 14**	**Year 15**
Residential Total	**$10,397,924**	**$9,219,969**	**$9,199,019**
EM&V	*$416,236*	*$369,082*	*$368,244*
Program Costs	*$9,981,688*	*$8,850,887*	*$8,830,775*
C&I Total	**$11,841,719**	**$15,211,179**	**$16,118,834**
EM&V	*$474,033*	*$608,915*	*$645,248*
Program Costs	*$11,367,686*	*$14,602,264*	*$15,473,586*
Energy Smart Total	**$22,239,643**	**$24,431,148**	**$25,317,853**
EM&V	*$890,269*	*$977,997*	*$1,013,492*
Program Costs	*$21,349,374*	*$23,453,151*	*$24,304,361*

ENERGY SMART - DSM PORTFOLIO SAVINGS			
	Year 13	**Year 14**	**Year 15**
Residential Total			
Participation	158,038	144,541	151,114
Gross Energy Savings (MWh)	50,371	35,803	35,789
Gross Demand Savings (MW)	3.62	2.80	2.83
C&I Total			
Participation	306	403	427
Gross Energy Savings (MWh)	54,248	71,972	75,594
Gross Demand Savings (MW)	8.64	9.79	10.75
Energy Smart Total			
Participation	158,344	144,944	151,541
Gross Energy Savings (MWh)	104,619	107,775	111,383
Gross Demand Savings (MW)	12.26	12.59	13.58

Net Benefits and Cost Effectiveness Analysis

The table below summarizes the cost effectiveness results for both the Total Resource Cost test (TRC) and the Utility Cost test (UCT), sometimes referred to as the Program Administrator Cost test (PACT). The screening tool relies on the most recent avoided costs determined through calculations that are consistent with the methodology that was implemented in the Entergy New Orleans IRP. The only offerings (excluding pilots) that fail to pass is the Income Qualified Weatherization, Appliance Recycling & Replacement and the School Kit and Community Outreach offerings. The outreach and community engagement costs included within the School Kits & Education program's budget led to increased energy savings benefits for the entire portfolio. The Appliance Recycling & Replacement offering includes high efficiency replacement refrigerators for income-qualified participants.

DSM PORTFOLIO COST EFFECTIVENESS ANALYSIS	TRC BENEFITS ($)	TRC RATIO	UCT RATIO
Small C&I Solutions	$7,384,555	1.1	1.7
Large C&I Solutions	$57,675,677	1.2	2.2
Publicly Funded Institutions	$16,465,987	1.3	1.7
C&I Construction Solutions	$7,102,225	2.1	2.4
Home Performance with ENERGY STAR ("HPwES")	$9,650,682	1.9	1.6
Retail Lighting and Appliances	$4,866,949	1.2	1.2
Multifamily Solutions	$3,028,593	1.1	1.0
Income Qualified Weatherization	$3,829,976	0.6	0.5
A/C Solutions	$4,429,122	1.2	1.0
Appliance Recycling & Replacement	$991,112	0.4	0.6
School Kits & Education and Community Outreach	$840,523	0.9	0.9
Behavioral	$1,699,417	1.0	1.0
TOTAL	**$117,964,818**	**1.2**	**1.6**

Program Budgets and Savings

The following tables represent the budget and savings totals for the program portfolio.

PROGRAM YEAR 13 - ENERGY SMART DSM PORTFOLIO BUDGET AND SAVINGS						
Offering	EM&V	Program Costs	Total	Participation	Gross Energy Savings (MWh)	Gross Demand Savings (MW)
Small C&I Solutions	$44,269	$1,061,607	$1,105,876	83	4,926	0.95
Large C&I Solutions	$289,071	$6,932,148	$7,221,219	136	35,009	6.47
Publicly Funded Institutions	$104,730	$2,511,513	$2,616,243	51	10,800	0.41
C&I Construction Solutions	$35,963	$862,418	$898,381	36	3,513	0.81
Home Performance with ENERGY STAR ("HPwES")	$101,412	$2,431,953	$2,533,365	24,415*	16,462	0.88
Retail Lighting and Appliances	$65,347	$1,567,068	$1,632,415	9,646	7,998	1.11
Multifamily Solutions	$39,123	$938,197	$977,320	1,525	2,678	0.14
Income Qualified Weatherization	$101,867	$2,442,862	$2,544,729	1,635	3,818	0.11
A/C Solutions	$48,993	$1,174,889	$1,223,882	1,319	2,848	1.24
Appliance Recycling & Replacement	$22,391	$536,966	$559,357	1,775	1,702	0.03
School Kits & Education and Community Outreach	$12,797	$306,885	$319,682	3,628	797	0.11
Behavioral	$24,306	$582,868	$607,174	114,095	14,068	0.00
TOTAL	$890,269	$21,349,374	$22,239,643	158,344	104,619	12.26

*Includes 22,500 Home Performance Kits.

PROGRAM YEAR 14 - ENERGY SMART DSM PORTFOLIO BUDGET AND SAVINGS						
Offering	EM&V	Program Costs	Total	Participation	Gross Energy Savings (MWh)	Gross Demand Savings (MW)
Small C&I Solutions	$58,243	$1,396,714	$1,454,957	107	6,350	1.11
Large C&I Solutions	$366,840	$8,797,118	$9,163,958	178	45,589	7.29
Publicly Funded Institutions	$144,123	$3,456,179	$3,600,302	74	15,731	0.40
C&I Construction Solutions	$39,709	$952,253	$991,962	44	4,302	0.99
Home Performance with ENERGY STAR ("HPwES")	$71,695	$1,719,315	$1,791,010	6,560*	3,404	0.97
Retail Lighting and Appliances	$45,060	$1,080,569	$1,125,629	1,440	1,559	0.02
Multifamily Solutions	$40,032	$960,003	$1,000,035	1,418	2,526	0.15
Income Qualified Weatherization	$95,912	$2,300,044	$2,395,956	1,472	3,221	0.07
A/C Solutions	$59,998	$1,438,801	$1,498,799	1,441	3,323	1.45
Appliance Recycling & Replacement	$23,283	$558,351	$581,634	1,854	1,786	0.03
School Kits & Education and Community Outreach	$12,797	$306,885	$319,682	3,628	797	0.11
Behavioral	$20,305	$486,919	$507,224	126,728	19,187	0.00
TOTAL	$977,997	$23,453,151	$24,431,148	144,944	107,775	12.59

*Includes 5,000 Home Performance Kits.

PROGRAM YEAR 15 - ENERGY SMART DSM PORTFOLIO BUDGET AND SAVINGS						
Offering	EM&V	Program Costs	Total	Participation	Gross Energy Savings (MWh)	Gross Demand Savings (MW)
Small C&I Solutions	$67,205	$1,611,634	$1,678,839	115	6,846	1.33
Large C&I Solutions	$386,182	$9,260,969	$9,647,151	186	47,767	7.78
Publicly Funded Institutions	$148,779	$3,567,849	$3,716,628	75	15,981	0.49
C&I Construction Solutions	$43,082	$1,033,134	$1,076,216	51	5,000	1.15
Home Performance with ENERGY STAR ("HPwES")	$62,206	$1,491,739	$1,553,945	1,580	2,392	0.90
Retail Lighting and Appliances	$47,066	$1,128,686	$1,175,752	1,466	1,587	0.02
Multifamily Solutions	$37,622	$902,197	$939,819	1,431	2,403	0.14
Income Qualified Weatherization	$93,220	$2,235,497	$2,328,717	1,472	2,990	0.03
A/C Solutions	$70,054	$1,679,951	$1,750,005	1,503	3,651	1.60
Appliance Recycling & Replacement	$24,559	$588,943	$613,502	1,937	1,917	0.03
School Kits & Education and Community Outreach	$12,797	$306,885	$319,682	3,628	797	0.11
Behavioral	$20,720	$496,877	$517,597	138,097	20,052	0.00
TOTAL	$1,013,492	$24,304,361	$25,317,853	151,541	111,383	13.58

Implementation Plan
NOLA Wise Schoolkits & Outreach Program

Proposal To: Entergy New Orleans
July 29, 2022

Submitted By: The National Theatre for Children (NTC)
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PROGRAM OBJECTIVE

The NOLA Wise Schoolkits and Outreach Program discussed in this Implementation Plan will have a term beginning on January 1, 2023 and continuing through December 31, 2025. The term coincides with Program Years 13-15 of the Council of the City of New Orleans's (Council) Energy Smart DSM program. The objective of the program is to secure a total of 797,088 kWh saved annually of residential energy and 2,391,264 kWh savings over the term of the program. The National Theatre for Children (NTC), in coordination with Entergy New Orleans (ENO), will recruit, enroll, deliver energy efficiency curriculum and disperse schoolkits to 4,100 students each year and secure installation to ENO residences to promote behavior change and create awareness regarding energy efficiency.

IMPLEMENTATION PROCESS

This document summarizes the Implementation Plan and proposed budget for the NOLA Wise Schoolkits & Outreach Program. It includes the program's outreach, school enrollment and customer journey, distribution of individual energy efficiency kits to enrolled schools, teacher recruitment and subsequent energy curriculum training, activation of parents in enrolled schools, quality assurance and quality control ("QA/QC"), and data collection/management procedures of the Schoolkits & Outreach Program.

PROGRAM DELIVERABLES

Under the umbrella program name, *Energy Academy*, NTC will work with ENO to customize the following deliverables to provide a comprehensive energy efficiency curriculum to enrolled schools in the NOLA Wise Schoolkits program:

- **Live Events in Schools** – Full school educational assemblies will align with national and state education standards for science, math and English language arts and can integrate with ENO's existing marketing, CSR, PR and community outreach initiatives. Parent-connect events will also be offered. *NTC will attempt to enroll 34 schools on behalf of ENO.*

- **Bilingual Print Materials** – English/Spanish. The package will include primary workbooks with activities for grades 2 and 5 and parent-student handbooks for grade 8.

- **Teacher Training Webinars** — Energy education webinars for teachers, with content adjusted for each grade span, presented four times each calendar year (approximately February, April, August and October)*.*

- **E-Learning Package –** NTC will work with ENO to provide a standards-aligned, ENO-branded e-learning package to enrolled schools and their educators with digital games and activities like e-books, graphic novels, lessons and assessments.

- **Take-Home Energy Saving Kits —** NTC will partner with Greenlite USA to drop ship *4,100 energy-saving kits* to 34 participating schools annually. An approximate average of 120 kits per school will be delivered. These kits will be delivered to 2nd, 5th and 8th grade classrooms, providing ENO with approximately *797,088 kWh of verifiable energy savings annually*.
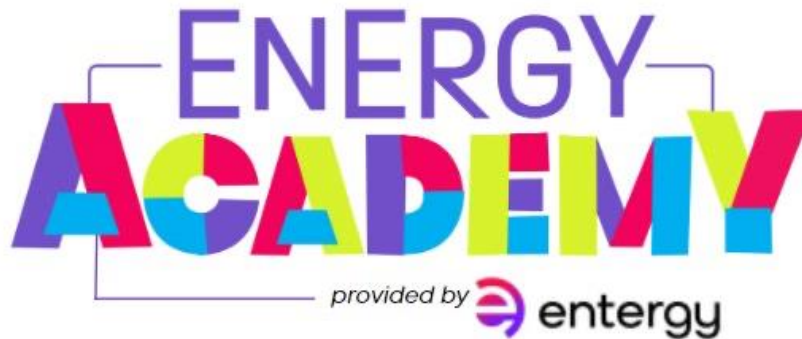
OUTREACH & RECRUITMENT

NTC will work with designated ENO Program Managers to identify, recruit and enroll schools and educators in the NOLA Wise Schoolkits program. NTC requests the following documentation from ENO to assist in recruitment:

- Zip codes of eligible schools
- Defined goals for low-income and historically underserved schools
- List of priority schools (if applicable)
- Current/recent participation in NOLA Wise Schoolkits program

NTC will work with ENO to identify (utilizing above information) and target school community outreach. NTC will attend any regular meetings or calls Program Managers may have with their stakeholders to assist in verifying eligibility and interest in the program.

NTC will position the NOLA Wise Schoolkits program as an easy incorporation for educators by centering outreach and recruitment around the program's educational concepts and how readily teachers can use it in their classrooms. Participation in the program will not only educate students and improve their energy habits, but it will also create a memorable and thorough educational experience in the classroom and make a lasting impact on the homes of the students by providing free energy-saving measures for installation and immediate use via the take-home schoolkit. By prioritizing teacher processes and working to fit in their schedules, we will remove barriers to full adoption of the program.

Primary outreach methods: NTC will develop and deliver ENO-approved marketing drip campaigns advertising the program to school educators and administrators, personal email campaigns from School Communication representatives to teachers, an outbound calling campaign from the NTC call center to main office administrators in each school, an ENO-branded schoolkit program website, direct mail, social media posts and press releases.

Campaigns and priority contacts: The outreach campaign begins with NTC School Communications representatives scheduling the live theatrical events. Priority of outreach recipients is determined by

the functional roles served within schools, including administrators, educators, media specialists, librarians, parent groups, etc. Targeted messaging is delivered to each group. NTC conducts outreach in three waves per priority group:

1. <u>School Administrators</u> – Necessary for enrolling full schools and multiple grade levels, this priority group drives opt-in for schools where multiple grades are eligible for schoolkits (grades 2, 5 and 8).
2. <u>Teachers</u> – Crucial to spreading awareness of the program and implementing the curriculum, teachers hold the highest influence in encouraging installation of measures at the students' homes and returning verification surveys. Additionally, they are eligible to enroll in teacher training for ENO and can be champions in gaining full school enrollment for live events and kit delivery.
3. <u>Stakeholders</u> – Including PTO, school specialists, administrative support staff and additional parent engagement contacts, this group is recruited to support the parent-connect event and support residential installation of take-home schoolkits.

SCHOOL ENROLLMENT

Educators at schools who have expressed interest in the program will be scheduled for the live tour and then enter the School Customer Journey:

⇒ **Verification**: Scheduling will occur via NTC's online booking portal or with an NTC School Communications representative. Every booking is verified by a coordinator who confirms the number of students/kits in the 2nd, 5th and 8th grade of that school, along with shipping information and primary contact. NTC will then work with the kit vendor to initiate the distribution process.

⇒ **Educational Materials Arrive**: After verification, supplemental materials (student playbooks or student-parent handbooks) are shipped and the digital curriculum (teacher toolkit and student activities) is loaded onto the web platform.

⇒ **Communication with Engaged Schools**: An email alert campaign will be triggered when a school booking is verified that systematically notifies school contacts when their materials have shipped, how their e-learning package can be accessed, when their show is coming up, how to use the kit and how to communicate with parents about the kit.

⇒ **Energy Kits Arrive**: Educators will distribute the kits to each of their students to use in their homes with family members. The educational program and e-learning package encourage and guide the installation and usage of the energy efficiency measures in ENO residential customer households.

⇒ **Live Event**: On the day of the educational event, students attend the *Energy Academy* live theatrical assembly, serving as a kick-off for energy education in school and inspiring students to take kits home and install measures immediately.

⇒ **Post-Event Engagement**: Another email alert system is triggered, supporting teachers as they advocate for their students' families to install kit measures. The emails also include prepared social media images and language for schools to use in promoting kits and the completion of parent and teacher evaluations. This step is a priority in collecting family installation surveys, gaining teacher surveys, and ensuring a high ratio of teachers and students fully adopt the behavior change.

TEACHER RECRUITMENT & WEBINAR TRAINING

NTC will work with the full school list and recruit teachers to participate in professional development on the topic of energy education. There will be one webinar per school quarter with a topic that ENO approves. Though subject to ENO approval, we suggest the topics of the four webinars are:

- Energy education through arts integration
- School energy audit
- Green career pathways
- Inspiring adoption of EE habits

ENERGY KIT ASSEMBLY & DISTRIBUTION

NTC will work closely with Greenlite USA to ensure consistent, reliable delivery of schoolkits to enrolled schools. In 2022, Greenlite is under contract with 115+ utilities nationwide, including all Exelon group utilities, delivering energy efficiency programs.

Greenlite will utilize their vertically integrated supply chain to guarantee timeliness and reliability. Greenlite's supply chain team supports inventory requirements for over 100+ utility programs and 6,000 retailer doors across 500 SKUs. Greenlite's manufacturing know-how is strengthened and led by the company's experience of over 150 years of manufacturing in the Asian subcontinent. As such, the Greenlite team is very well qualified to manage the supply chain for this program.

Greenlite is a highly valued and long-time partner of international freight forwarders and customs brokers such as CH Robinson, AM Deringer and GAC. Greenlite has also proactively been certified as C-TPAT compliant (Customs Trade Partnership Against Terrorism) for the past five years. C-TPAT certification means that Greenlite's cargo has surpassed the most stringent security clearance offered in North America. As such, Greenlite enjoys a variety of benefits that make the customs clearance process more effective. More importantly, membership in C-TPAT makes the customs clearance process safer. When Customs and Border Protections (CBP) knows Greenlite is C-TPAT certified, they can reduce the number of examinations. Another benefit includes front-of-the-line inspections. Finally, C-TPAT certification allows Greenlite to take advantage of faster import processing with a secure supply chain.

QUALITY ASSURANCE & QUALITY CONTROL (QA/QC)

NTC will utilize a variation of methods to assure consistency at scale and quality throughout each touchpoint for program participants and implementation partners.

Establishing consistency of messaging and experiential standards is part of the auditioning, hiring and on-boarding process for NTC touring staff. NTC professional actor-educators will audition and be cast based on teaching artist experience, consistent actor presence and proximity to the ENO service territory. They will be brought to NTC's home offices in Minneapolis to be on-boarded to the ENO program as a whole, as well as to the live event they will facilitate across 34 schools. Touring *Energy Academy* actor-educators will be paired with the NTC Tour Coordinator who confirms enrolled schools. While the tour is active for the live events, the Tour Coordinator serves as a daily check-in and touchpoint for the actor-educators and school contacts to confirm no missed connections, miscommunications or negative user experience in the implementation of the live event itself at each school.

On the backend of the actor-educator QA/QC, the Tour Coordinator will facilitate a daily evaluation to the actor-educators of how each live event went. This allows NTC to identify any issues with the production itself, which could include rental car or lodging issues, problems with sets, props and costumes, tour logistics such as drive time between schools, or issues between tour partners. This will allow for expedience in any situations that require a level set.

Through real-time evaluation processes, all enrolled schools will be solicited for feedback from teachers through digital surveys deployed immediately by an email alert system after schools receive both the live event and take-home kits. The online evaluations will provide teacher ratings on the value of the educational materials, the program's impact on student learning, the professionalism of NTC actor-educators, the likeliness of teachers' interest in future programs, which elements of the program they interacted with, how active classroom parents were in the kit distribution and what students liked best about the program. Because these evaluations are completed soon after each live event, adjustments to the program can be made should we recognize any issues raised by educators.

NTC encourages ENO program managers to visit schools during their *Energy Academy* live event and see the program for themselves. Feedback from these representatives is welcomed as NTC consistently works to maintain and improve programming. Tour schedules will be available online for client review. NTC provides regular updates on tour status, and all tour-related metrics are provided in a final report at the end of each tour.

NTC has identified six key components for successful educational programming. The Key Performance Indicators (KPIs) are:
1) **Educational Value** – Measured through teacher and student surveys
2) **Consistency at Scale** – Bringing ENO's educational messaging to the largest possible audience while retaining quality
3) **Cost per Resident** – Calculated by program expense and quantity of impacted students, parents and educators
4) **Measurable Usage** – Quantified by teacher and student surveys
5) **Parental Activation** – Gathered by installation survey of kit measures and qualitative assessment of parent-connect event
6) **Public Relations Value** – Measured by press hits and social media mentions

The measurement of each KPI is built into regular assessment as part of the QA/QC process.

DATA MANAGEMENT & REPORTING

NTC will work with ENO and Greenlite USA to develop a set of data fields that are captured during enrollment, kit installation and after each live event.

NTC utilizes Salesforce as a CRM and database. Program data will be recorded by NTC and communicated to ENO in a mutually agreed upon format. NTC processes will integrate with ENO's Demand Management Tracking System.

All reporting requirements and formats will be discussed with ENO during program development discussions.

A pre-addressed student survey postcard will be included in each EE kit that requests information from an adult in the household about the installation of each kit component as well as participant satisfaction with the items. It will also be offered digitally on the *Energy Academy* website. All data will be mapped to secure reports and shared regularly with ENO.

NTC may consult the third-party evaluator (TPE) to determine the success of a program without bias. We will determine one internal point of contact for the TPE to guarantee efficacy and transparency in each step. NTC will provide ENO raw quantitative and qualitative data in comprehensive reports delivered at a mutually agreed upon frequency, encourage the TPE to attend educational events and cultivate communication that is clear, honest and professional.

NOLA WISE SCHOOLKITS BUDGET

NTC's NOLA Wise Schoolkits Program budget is below. This includes line items for take-home energy kits, live event performance development, outreach and marketing, teacher recruitment and webinar training, the e-learning package with custom games and activities, the scaffolded education curriculum, bilingual printed materials, program website and verification of energy-saving measure installation.

Budget is based on an annual savings of 797,088 kWh with 34 schools participating and 4,100 energy kits distributed to students each program year.

	PY13	PY14	PY15
NOLA Wise Schoolkits Budget	$ 169,718	$ 169,718	$ 169,718

Detailed budget by line item listed below:

Development, Marketing & Deliverables for Livestream Events	Cost per school		Totals	Program Cost %
Grade K-8 Program Marketing, Outreach, Activation, Scheduling, covers labor within SC depart, Lead Reps, Call Center for 33 schools, R&D for each marketing material for deliverables. Communications with teachers and schools once signed up, verification process	$ 358.00	$	12,052.67	7%
Grade K-5 Live Program Custom Development, Scripts, Build and Rehearsal	$ 105.00	$	3,325.00	2%
Grade 8 Live Program Custom Development, Scripts, Build and Rehearsal	$ 360.00	$	720.00	0%
Grade K-5 Live Tour (Performances, Travel, Talent)	$ 365.00	$	11,558.33	7%
Grade 8 Live Tour (Performances, Travel, Talent)	$ 750.00	$	1,500.00	1%
Website design, reports, ADA and digital BRC	$ 65.00	$	2,188.33	1%
Bi-Lingual Curriculum Development (Writing, Research, Art Design)	$ 65.00	$	2,188.33	1%
1 Live in person Parent Connect Event	$ 125.00	$	4,208.33	2%
4 Educational Webinars (1 per quarter)	$ 300.00	$	10,100.00	6%
Project Management, Client Services, Data Management, Reporting	$ 125.00	$	4,208.33	2%
Educational Materials Printing	$ 400.00	$	13,466.67	8%
Educational Materials Shipping	$ 25.00	$	841.67	0%
Kit + Measures + Delivery	$ 2,928.71	$	98,600.00	58%
Teacher Incentive for Survey Returns ($50/teacher) (34 schools) (4 teachers/school) 70% participation	$ 200.00	$	4,760.00	3%
	$ 6,171.71	$	169,717.67	100%

	Total Annual Cost	
	$ 169,717.67	

January 1, 2023 – December 31, 2025 Program Years 13-15 Energy Smart Residential Demand Response Plan

7/29/2022

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Summary

Entergy New Orleans, LLC (ENO) selected Aptim Environmental & Infrastructure, LLC (APTIM) as the Third-Party Administrator (TPA) to deliver the Energy Smart portfolio of demand side management programs for the period of January 1, 2023 to December 31, 2025. APTIM will be retained by ENO to implement, deliver, administer and conduct Quality Control/Quality Assurance (QC/QA) and some measurement and evaluation of the energy conservation, and residential demand side management programs as approved by the Council for the City of New Orleans (Council). The Demand Response (DR) plan outlined in this document details the proposed design, budgets, and savings targets for the Energy Smart portfolio in Program Years 13, 14 and 15 which run from January 1, 2023 to December 31, 2025.

Demand Response (DR) offerings provide utilities with customer-centric tools to manage generation and transmission capacity challenges during periods of high energy demand. Peak load curtailment through DR programs is typically achieved by offering customers the option to reduce their heating and cooling loads during peak demand events through temperature set-back adjustments of Heating, Ventilation and Air Conditioning (HVAC) equipment. For their contribution, customers are offered incentives during initial enrollment and/or following their participation in peak demand events.

ENO has pursued peak load management through a residential Direct Load Control (DLC) demand response pilot for residential customers since 2016. In recognition of the need for a broader range of demand response solutions, ENO has expanded offerings for its Residential customers this program cycle.

Residential Demand Response Offerings

Energy Smart will continue to deploy a Bring Your Own Thermostat (BYOT) demand response program, in which residential customers purchase and install qualifying connected thermostats from device manufacturers on their own, or via the Energy Smart Online Marketplace and voluntarily enroll those devices in the BYOT 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. EnergyHub's program services include vendor management, marketing coordination, enrollment and DR event support, customer support, and other day-to-day program management activities.

EnergyHub will work with APTIM to coordinate marketing activities and DR dispatch of the EasyCool BYOT program. EnergyHub will also work with APTIM and Franklin Energy to enable the pre-enrollment of connected thermostats that are purchased through the Residential Energy Smart Online Marketplace in the EasyCool program.

The smart thermostat-based DR program will be the primary device type for scaling ENO's residential DR resource. Compared to other potential device types (e.g., water heater switches or pool pumps), this proposed measure and BYOT program design is more cost-effective and avoids the need for field services to support the installation and maintenance of other devices. Smart thermostats have current widespread deployment and an estimated 15% year-over-year growth in new installations. Historically, these devices catered to technology early adopters, however new models with reduced price points and the ability to stack energy efficiency and DR rebates in the Energy Smart Online Marketplace create an opportunity to engage this measure with ENO's low- and moderate-income customers. The estimated 13 MW resource by 2025 in this plan equates to participation from about 5% of ENO residential customers. These forecasts are in line with both the 2021 GDS and Guidehouse potential study findings.

ENO will also pursue an Opt-in Peak Time Rebate Pilot designed to flexibly manage demand including reducing total peak usage, shifting load off-peak, and optimizing grid load and demand. The proposed Peak Time Rebate Pilot allows ENO to call events year-round and would include customer engagement through email and SMS text messaging. Notification for events would be required 24-72 hours in advance and based on notice given, relevant pre-event communications would be sent to enrolled customers. The customer participation pathway is designed to integrate seamlessly in conjunction with co-existing Customer Engagement and Behavioral Energy Efficiency customer journeys.

Bring Your Own Thermostat

The residential BYOT DR offering 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. Customers participating in the program will receive an incentive upon enrollment, as well as an ongoing annual incentive for continued participation in the program.

Marketing & Outreach

EnergyHub will coordinate a BYOT DR marketing campaign leveraging device partner communication channels (email, web and mobile applications). Device partner marketing collateral will feature both the device partner and utility branding and will direct customers with existing qualifying thermostats to enroll their devices in the DR program through the device partner web or mobile application experience. APTIM will coordinate a corporate marketing campaign focused on raising awareness of the residential BYOT DR program. APTIM-led marketing will direct customers to an EnergyHub-powered "microsite" to enroll their existing device in the residential DR program through the device partner web or mobile application experience. Marketing will also present the option to purchase a connected device on the Energy Smart Online Marketplace.

APTIM's marketing materials will focus on raising program awareness, educating residential consumers on program details, generating interest, and presenting a clear call-to-action for potential participants.

APTIM and EnergyHub will coordinate efforts so that DR enrollments captured in Mercury may be imported into APTracks so that comprehensive information on each customer's participation in both energy efficiency and demand response offerings will be accessible to program staff. A comprehensive understanding of customer engagement in DSM and DR will streamline outreach efforts and ensure marketing can be targeted to customers' specific opportunities to participate.

Customer Enrollment and Participation

ENO residential customers with working central air conditioning, and a connected thermostat supported by the Mercury DERMS platform can participate in the BYOT DR program. Customers must provide basic information (name, address, email) and accept the program terms and conditions (T&Cs) to apply to the BYOT DR program. The customer T&Cs set forth the program eligibility requirements and other relevant program information.

ENO residential customers that have existing connected thermostats will be directed from outbound marketing to enrollment pages for each device manufacturer where they will provide basic information to apply to the residential BYOT DR program. Customers that do not yet have a connected thermostat will receive marketing directing them to the Energy Smart Online

Marketplace. Customers that purchase the connected thermostat through the Online Marketplace will leverage the energy efficiency and EasyCool enrollment incentives at the point of purchase, with the connected thermostat pre-enrolled in the EasyCool program (i.e. once the customer registers and installs the device, it will automatically be enrolled, with no further action required by the customer).

APTIM will process BYOT DR applications using the Mercury DERMS enrollment tool. Once accepted by APTIM, enrollment incentive is issued, and residential customers are automatically available for DR dispatch within the Mercury DERMS. Participating customers will experience a temperature adjustment when a DR event is dispatched from the Mercury DERMS. Customers will be able to opt out of a DR event at any time, or may un-enroll from the BYOT program, if desired.

The program team has recommended a change to the incentive structure to include $50 enrollment incentive and $25 annual participation. Past program cycle experience indicates the enrollment incentive is the primary variable that impacts enrollment rates. By lowering the existing annual participation incentive from $40 to $25, the program's overall cost-effectiveness will be improved. This reduction is not expected to materially impact the program's attrition rate over time.

Data Collection

The Mercury DERMS platform collects data through technical integrations with each of its device partners and provides near real-time access to device data such as connectivity status, operating mode, temperature setpoint, indoor/outdoor temperature, and runtime interval data. Data available to ENO (e.g., connectivity, mode, runtime intervals) depends on device data fed to Mercury DERMS through its integrations with device partners; some manufacturers provide only a subset of this device data. Customers will authorize their device partner to share their application information and device data with ENO and its contractors (APTIM and EnergyHub) as part of T&Cs acceptance during the enrollment process.

The Mercury DERMS dashboard provides the operator with a portfolio-level view of the DR aggregation:
- Near real-time information on the devices under management including operating mode, connectivity status, current and forecasted HVAC load.
- DR event reports including participation statistics, load and load shed interval data.
- Customer enrollment status (e.g., Accepted, Rejected, Unenrolled).

The Mercury DERMS enables ENO to configure and schedule DR events on devices enrolled in the BYOT program. Events can be configured on an ad hoc basis (one-time) or as a part of a previously configured program strategy that can be dispatched repeatedly. ENO can dispatch all devices in the program for a given DR event, or group devices for targeted dispatch.

Mercury DERMS performs measurement and verification of performance following load control events. Mercury generates a DR baseline for each interval of the DR event based on the historical usage of targeted devices. The baseline is compared to actual runtime usage of targeted devices in a given interval to determine event performance. Mercury supports multiple DR baseline methodologies. In addition, Mercury DERMS provides DR event reports that the operator can view during and after the completion of a DR event for M&V and analysis. DR event reports (e.g., participation statistics, load and load shed interval data) are available for download from DERMS on demand following the completion of an event and will be provided to the program evaluator.

Peak Time Rebate Pilot

The Opt- in Peak Time Rebate Pilot will engage customers to reduce energy consumption during Peak Events. The proposed Pilot allows ENO to call events year-round and will include customer engagement through email and SMS text messaging. Email communications will notify customers when events are imminent and provide clear recommendations on how and when to reduce their energy consumption. The Pilot is designed to meet ENO's targets by balancing customer participation with an eight-event strategy.

Notification for events will be required 24-72 hours in advance and based on notice given, relevant pre-event communications will be sent to enrolled customers. The customer participation pathway is designed to integrate seamlessly in conjunction with co-existing Customer Engagement and Behavioral Energy Efficiency customer journeys.

This plan includes:
- o Peak Time Rebate Pilot enrollment campaigns.
- o Peak Time Rebate event notifications for customers prior to the event including insights about their typical usage and how they can save the most energy and money for the event.
- o Pre-event notifications for customers to indicate event start.
- o Post-event notifications including results from the event for the individual and the community.
- o Event impact measurement and performance for incentive processing.

This Pilot will leverage Bidgely's AI to identify the best potential customers to recruit and treatment channels. This Pilot provides an approach to behavioral demand response that will keep customers engaged and will allow ENO to meet more aggressive goals in the future. The summarized approach is outlined in the table below.

ENERGY SMART - PEAK TIME REBATE PILOT			
	Year 13	Year 14	Year 15
Number of Customers Eligible	48,272	67,487	84,780
Expected Participation from Eligible Customers	4%	4%	4%
Total Annual Participants	1,931	2,699	3,391
PTR Events per Year	8	8	8
Peak Event Duration (hours)	4	4	4

Marketing & Outreach

APTIM will partner with Bidgely to offer enrollment communications intended to alert customers about the Pilot and motivate them to enroll. Leveraging the Behavioral Energy Efficiency (HERs) the program can recommend the Peak Time Rebates Pilot to target all eligible digital HERs customers. These communications will give potential participants an overview of the Pilot, and even inform them of how much they could save, allowing for a more effective and results-driven Pilot recruitment.

Customer Enrollment and Participation

ENO Customers will be prompted to enroll in a Peak Time Rebates program to shift their kWh load during peak time events. Enrolled customers can earn up to $25 incentive in return for adjusting their energy usage during these critical peak demand and reliability periods. Enrolled customers will receive Pre-event, During and Post-event alerts that remind and guide them to behaviorally shift or reduce their variable electric loads to help earn their total potential incentive.

Pre-Event communications are crucial to educate and inform customers about the event, the benefits of participating, and practical ways in which they can save. Pre-Event notifications will go out 48 hours, 24 hours, and 8 hours prior to the event as well as at the beginning of the event. APTIM is uniquely positioned to inform customers about what specific steps they need to take to save energy based on Bidgely's best-in-class appliance disaggregation.

A general event-end communication is sent out to all customers at the end of the event period. It will include a note indicating that results will be available soon. After ingestion of AMI interval data for each customer the program team will calculate the amount of energy a customer saved during the event compared to the baseline. Once the savings for the event has been calculated the post event summary will be sent to customers which includes an hour-by-hour breakdown of their performance. Upon completion of each pilot program year, each customer's cumulative demand reduction kWh will be calculated to determine their performance and corresponding incentive amount capped at $25.

Data Collection

Performance can be calculated by taking the difference between each customer's usage during the peak event and their baseline. APTIM recommends using an "n in x" baseline, for example, a 5 in 10 baseline is calculated by taking the average hourly usage of the top 5 highest kWh days of the past 10 weekdays (Holidays excluded). Overall shift measurement is leveraged in the same fashion. The program EM&V evaluator will define the final type of baseline and measurement approach for this Pilot.

Budgets & Savings

1. **Portfolio Budgets and Savings**
   The budgets outlined within this plan include an allocation toward EM&V, which totals 4% of the annual budget for the relevant offerings.

ENERGY SMART - DR PORTFOLIO BUDGETS			
	Year 13	**Year 14**	**Year 15**
Residential Total	**$1,200,019**	**$1,207,632**	**$1,343,077**
EM&V	*$48,038*	*$48,342*	*$53,764*
Program Costs	*$1,151,981*	*$1,159,290*	*$1,289,313*

ENERGY SMART - DR PORTFOLIO SAVINGS			
	Year 13	**Year 14**	**Year 15**
Residential Total			
Participation	11,531	14,299	16,991
Gross Demand Savings (MW)	16.74	21.58	26.14

2. Annual Portfolio Budgets & Savings

The following tables represent the budget and savings totals for the program portfolio.

PROGRAM YEAR 13 - ENERGY SMART DR PORTFOLIO BUDGET AND SAVINGS					
Offering	EM&V	Program Costs	Total	Participation	Gross Demand Savings (MW)
Residential Peak Time Rebate Pilot	$11,085	$265,835	$276,920	1931	7.14
Residential - BYOT	$36,952	$886,146	$923,098	9,600	9.6
TOTAL	$48,038	$1,151,981	$1,200,019	11531	16.74

PROGRAM YEAR 14 - ENERGY SMART DR PORTFOLIO BUDGET AND SAVINGS					
Offering	EM&V	Program Costs	Total	Participation	Gross Demand Savings (MW)
Residential Peak Time Rebate Pilot	$9,858	$236,395	$246,253	2699	9.98
Residential - BYOT	$38,485	$922,895	$961,380	11,600	11.6
TOTAL	$48,342	$1,159,290	$1,207,632	14299	21.58

PROGRAM YEAR 15 - ENERGY SMART DR PORTFOLIO BUDGET AND SAVINGS					
Offering	EM&V	Program Costs	Total	Participation	Gross Demand Savings (MW)
Residential Peak Time Rebate Pilot	$10,594	$254,055	$264,649	3391	12.54
Residential - BYOT	$43,170	$1,035,258	$1,078,428	13,600	13.6
TOTAL	$53,764	$1,289,313	$1,343,077	16991	26.14

3. Net Benefits and Cost Effectiveness Analysis

The Residential Peak Time Rebate Pilot is forecasted to exceed a TRC of 5 during the three-year planning period. Residential BYOT is forecasted to reach a TRC of 1.5 during the three-year planning period. The 2021 Demand Side Management Potential Studies performed by GDS Associates and Guidehouse Inc. provide one TRC value for a 20-year period. The offerings above would have higher TRCs if a 20-year period was utilized.

DR PORTFOLIO COST EFFECTIVENESS ANALYSIS	TRC BENEFITS ($)	TRC RATIO	UCT RATIO
Residential Peak Time Rebate Pilot	$2,206,415	3.8	2.8
Residential - BYOT	$2,585,354	1.4	0.9
TOTAL	$4,791,769	1.94	1.28

DR ANNUAL TRC ANALYSIS	Year 13	Year 14	Year 15
Residential Peak Time Rebate Pilot	2.3	4.1	5.3
Residential - BYOT	1.2	1.4	1.5

1. **Cost-Effectiveness of the Peak Time Rebate (PTR) Pilot**

The procedures for cost-effectiveness testing of Energy Smart programs are well-established and use the Total Resource Cost (TRC) test from the California Standard Practice Manual (SPM). When extrapolating the cost-effectiveness of the Pilot to a future, more widespread implementation, the following additional parameters need to be accounted for:

a. **Drop-off of fixed costs:** The initial development of the PTR Pilot will entail higher fixed costs for the recruitment of the initial Pilot cohort. The Pilot period will assist in development of program infrastructure that will be usable for future full-scale program implementation.
b. **Annual recruitment level at full-scale program implementation.** With this target in mind, extrapolation of pilot findings to full program implementation will account for increased benefits and economies of scale when expanding the program. For illustrative purposes, we assume full-scale recruitment of approximately an additional 700 customers annually.

With these parameters in mind, cost-effectiveness testing of full-scale implementation of a PTR program will be calculated as follows:

a. **TRC of the Pilot in Year 1:** This calculation places the full upfront costs of recruitment in Year 1, as demonstrated in the TRC and UCT values provided herein. These scores assume a 10-year Effective Useful Life. There is no "measure life" per say, in that there is no equipment, but for the purpose of forecasting long term benefits and costs, the measure life is aligning with the Easy Cool Bring Your Own Thermostat (BYOT) program offering.
b. **TRC of the pilot in a subsequent program year, if kept at pilot scale:** This calculation accounts for the drop-off in fixed program costs associated with initial program development and assumes that the program recruits the same number of customers annually. This would assume a new group of 100 customers recruited annually, credited each year with a 10-year measure life.
c. **TRC of expanded program implementation:** This calculation provides the cost-effectiveness of administering the program at an expanded scale. The energy and demand savings from pilot participants will be extrapolated to future participants in terms of percent of annual usage saved. The annual percent savings from pilot participants will be multiplied by ENO's annual average residential energy use, and then multiplied by the target number of customers to be recruited.

Item (c) detailed above will provide a more accurate representation of cost-effectiveness findings after expansion to full-scale implementation. With this in mind, full-program cost-effectiveness would be estimated using:

a. Marginal upfront costs associated with recruitment of an additional 700 residential accounts to scale the program from Pilot to full-program scale in Year 2;

b. Estimates of program cost reduction once the effort to establish program infrastructure is complete; and

c. Extrapolation of Year-1 pilot findings for per-customer kWh and kW reductions (denominated by percent of annual use and percent of peak use) to a program comprised an additional 700 accounts per year.

The extrapolated values will reflect the life cycle cost-effectiveness of administering a full-scale PTR program over a program cycle.

2. EM&V Methods

Savings from the PTR Pilot will be evaluated using the following data sources:

a. **ENO billing data.** The primary data analysis will be based on billed use recorded by ENO. Impact analysis of DR events called in the Pilot will be conducted with ENO's AMI data.

3. EM&V Results

The following considerations need to be taken in addressing the EM&V results:

a. **Summer & Winter peak events.** Event analysis will be completed in the same manner has done in Easy Cool BYOT events.

b. **Customer financial impacts.** When addressing rate-based programs, the Participant Cost Test (PCT) is acutely important. Rate-based programs introduce a mathematical possibility of higher utility costs, depending on a customer's preexisting energy load shape and the degree of flexibility they have to adjust use for time even time. The evaluation will include addressing the PCT values for various cohorts, and identifying any customer classes that demonstrate risk of financial loss as result of participation.

Honeywell

Implementation Plan
Large Commercial Demand Response

Proposal To:	Entergy New Orleans
	29 July 2022
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CONTENTS

PROGRAM OBJECTIVE

The Commercial Demand Response (DR) Program discussed in this implementation plan will have a term beginning on January 1, 2023 and continuing through December 31, 2025. The term coincides with Program Years 13-15 of the Council of the City of New Orleans's (Council) Energy Smart DSM program. The objective of the program is to secure a total of 7.5 megawatts (MW) of new commercial demand shed over the term of the program. Honeywell Smart Energy (HSE), in coordination with Entergy New Orleans (ENO) will recruit, enroll, conduct DR Surveys, and install control equipment at customer sites to provide a turn-key solution for ENO Commercial customers.

IMPLEMENTATION PROCESS

This document summarizes the implementation plan and proposed budget for the Commercial DR Program. It includes the program's outreach, customer DR Survey / enrollment, trade ally recruitment/training, hardware and software, Evaluation, Measurement &Verification ("EM&V"), and data collection/management procedures of DR performance.

OUTREACH / RECRUITMENT

HSE will work with designated commercial ENO Account Managers to identify, recruit, and enroll customers in the Commercial DR program. HSE requests the following documentation from ENO to assist in recruitment:

- Commercial customer list of all accounts that includes:
  - Customer Name and contact information (address, phone, email)
  - Peak demand (kW) and usage (kWh)
  - Current participation in Energy Smart Program(s)
  - Assigned ENO Account Manager (if applicable)

HSE will work with ENO Account Managers to identify (utilizing above information) and target customer outreach. HSE will attend any regular meetings or calls Account Managers may have with their customers to assist in verifying eligibility and interest in the program.

CUSTOMER DR SURVEY / ENROLLMENT

Commercial customers who have expressed interest in the program will be scheduled for an initial facility walk through and discussion with HSE and/or ENO representative. If the customer remains interested and the facility walk through determines that facility is likely eligible to participate, then a full DR survey will be scheduled. The DR survey will collect data on facility/customer operations, major energy consuming high demand equipment/appliances, existing building management system (BMS), and electrical meter location. The site data collected for the program will be agreed upon between HSE and ENO and outlined in the SOW. The site survey will highlight potential measures that can be curtailed to reduce demand within acceptable customer operational constraints.

The DR survey will be sent to customer within 30 days of the site visit. After review and discussion of the survey with customer and if in agreement on proposed shed measures, customer would sign the DR Agreement. The DR Agreement would be between the customer and ENO and indicates how DR events will be dispatched, and how performance payments will be calculated and paid. Performance payments are calculated based on AMI meter data received from ENO. A pulse box will be installed by HSE to log demand data for performance calculations should any major accounts billable customer not have an AMI meter.

TRADE ALLY RECRUITMENT / TRAINING

We understand from our direct experience that recruiting and maintaining a strong and active network of trade allies is the main key to meeting savings and customer satisfaction goals. We have developed a local and diverse network of trade allies that we utilize for ADR project implementation. We will utilize these trade ally partners and continue to recruit and train additional contractors that can help with project implementation and recruiting. Local, existing knowledge of facilities has proven to reduce time and cost of project selection, validation and installation.

All automated solutions for the Commercial DR program will use the appropriate hardware that has been approved by the Open DR Alliance to enable the automated, remote accessible dispatch of load control signals and performance data metrics. Specific load control shed measures are tailored to individual customer facility and their operations. BMS programming changes will be conducted by the customers current BMS provider or by a recruited subcontractor who is familiar and has the licensing to perform such work for customer.

GATEWAY & SUPPORTING HARDWARE INSTALLATION

Honeywell will utilize the following procedures when installing and commissioning the DR hardware and software:

a) Install gateway in agreed upon location at customer facility. Gateway will be installed in the vicinity of the BMS controller and ENO utility meter.
b) Ensure gateway is connected to DR software platform.
c) Site connectivity will be through facility/customer supplied internet connection or via a cellular gateway. Internet connection allows for remote event dispatch, monitoring, and Evaluation, Measurement and Verification (EM&V).
d) Configure existing facility BMS for agreed upon load shed measures. Programming is typically completed by existing facility BMS contractor or another subcontractor familiar with the system.
e) Following programming and hardware installation, function testing to include multiple test events will be conducted to verify load shed and installation is functioning as designed.

Following test events, local HSE and subcontractor personnel will confer with customer and ENO to ensure installation and performance has met objectives. Further programming or modifications can be accomplished to ensure all targets are achieved.

Installation will be completed by local HSE personnel or trade ally.

DR DISPATCH, CONTROL & OPTIMIZATION SOFTWARE

Honeywell will be deploying an advanced software platform for dispatch, control, and optimization of all DR resources enrolled in the Program. This software platform, Concerto®, will be provided by Honeywell's partner Generac Grid Services (GGS).

Honeywell will utilize Concerto to advance its goals of maximizing customer satisfaction for participants in the Program while simultaneously maximizing reliability of the Program for ENO. Key features of the software platform that Honeywell will provide to ENO include:

a) Dispatch of DR resources
- Day-Ahead forward scheduling and fast 10-minute dispatch
- Events can call for assets to be ramped in/out slowly, curtailed immediately for emergencies, or anything in-between

a) Constraint based dispatch to ensure customer set limits are never exceeded, thereby reducing participant fatigue and ensuring the flexibly is always available.
b) Flexible methods and technology to connect to customer assets, supporting dispatch ranging from 100% control by customer to fully automated response
c) Customer ability to opt out of future or current events regardless of how they are connected/dispatched to/from Concerto
d) Unlimited ways to group customers/assets that allows ENO to call only the assets where they are needed, when they are needed
e) Two-way feedback loop to monitor and control assets
- Allows for real-time measurement & verification of customer/asset performance
- Provides the ability for the platform to constantly re-optimize how much demand is curtailed by each customer as real-time results reveal over or under-performance
f) Concerto User interface available to ENO to view real-time status of assets enrolled in Program
g) Adaptable to new and changing technologies that can provide flexibility to the program (i.e. batteries, electric vehicles, distributed solar, etc.) as new innovations come to market, allowing ENO to avoid obsolescence

EVALUATION, MEASUREMENT & VERIFICATION (EM&V)

AMI meter data, supplied by ENO via a Secure File Transfer Protocol (SFTP) on a nightly basis, will be utilized by Concerto to calculate performance and associated incentive payments. Alternatively, pulse data functionality, via compatible ENO meters, can be installed by HSE to enable real-time demand data transmission to Concerto. Both methods are currently in use and have proven reliable.

Concerto utilizes an industry standardized approach to baseline customer energy demand and resulting event performance. Performance will be calculated after each event and communicated to ENO and customer. Payments will be sent to customer following completion of each DR season in October and May time frame.

DATA MANAGEMENT & REPORTING
HSE will utilize the follow data fields to verify customer eligibility and track DR performance: Customer name, address, phone and account numbers.

Following ADR gateway installation, the MAC ID, Premise ID, Gateway ID, and corresponding facility address will be recorded and loaded into Concerto. Customer data and event performance will be sent to ENO following each event with a consolidated report sent after season end.

COMMERCIAL DR BUDGET & TOTAL RESOURCE COST (TRC)
HSE Commercial DR Program budget is below. This includes line items for hardware, Concerto, Command Central, outreach/enrollment, trade ally recruitment/training, and installation and programming of DR hardware and software. Budget is based on a cumulative DR demand shed of 10.47MW with 7.5MW of demand shed being new installations over program period. TRC scores vary year to year depending on the acquisition and curtailment strategies. Given this is a mature program we estimate a TRC of 2.36 at the end of year one.

	Year 1	Year 2	Year 3
Combined Implementation + Incentives	**$914,821**	**$782,004**	**$846,069**
Cumulative kW	**6,970**	**8,870**	**10,470**
Cumulative Participants	**20**	**28**	**38**

Implementation Plan
Bring Your Own Charger® (BYOC) Pilot Program

July 2022

Developed for

entergy

by

sagewell[SM]

Table of Contents

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PROGRAM OBJECTIVE

The *Bring Your Own Charger*® (BYOC) Pilot Program discussed in this implementation plan will have a term beginning on January 1, 2023 and continuing through December 31, 2025. The term coincides with Program Years 13-15 of the Council of the City of New Orleans's (Council) Energy Smart DSM program. The objective of the program is to shift electric vehicle (EV) load to off-peak hours, when demands on the electric system are lowest. BYOC leverages existing investments in AMI smart meter infrastructure to monitor customer electric vehicle charging behavior. The program is open to any make or model of EV using any level 2 charger. Sagewell, in coordination with Entergy New Orleans (ENO) will recruit, enroll, monitor charging and issue incentives to participating electric vehicle drivers in ENO territory. The Pilot will enroll up to 350 participants each year, with cumulative totals of 350, 750 and 1050 EVs across all three program years.

Electric Vehicles are some of the largest contributors, on an individual basis, to peak load. Any effort that intends to reduce kW demand must address electric vehicle charging. The Bring Your Own Charger® program has been designed to maximize customer participation and overall kW and kWh shifted to off-peak hours. The core of the BYOC model is its simplicity. The program has been designed to lower barriers for customers, and to make the program as straightforward and clear as possible.

IMPLEMENTATION PROCESS

This document summarizes the implementation plan and proposed budget for the Bring Your Own Charger® (BYOC) Pilot Program. It includes technical implementation, customer recruitment and enrollment, EV charging load monitoring, evaluation, measurement and verification, and program budget and value calculations.

TECHNICAL IMPLEMENTATION

Sagewell will coordinate with ENO IT staff to create technical systems to operate the BYOC pilot program. There are several areas of technical implementation:

- Data transfer;
- Analytics and reporting platforms;
- Enrollment application, and participation requirements;
- Customer support systems.

Data Transfers

Sagewell and ENO staff will set up an automated process for transferring AMI meter data and customer data to Sagewell's secure Amazon Web Service (AWS) servers - including both historical data and on-going data transfers. This data will be used to identify potential participants, verify eligibility and monitor EV charging behavior.

Example of data to be provided by ENO - exact data received may vary:
- Electric consumption data
  - Date and time (UTC), as timestamp or separate fields;
  - Meter number (or other unique identifier like service point ID or premise number);
  - Reading (Wh or KWh).
- Customer account data
  - Account holder name;
  - Account number;
  - Service address;
  - Rate code(s);
  - Meter number(s) (or other unique identifier like SDP or premise number).

Analytics and Reporting Platforms

Sagewell will create ENO-specific instances of our analytics and reporting platforms, as well as provide secure access for relevant ENO staff. These platforms will monitor customer charging behavior, enable EVFinder^{SM} to identify likely EVs, and allow ENO to access program reporting and performance data. The data will help ENO identify potential areas where electric vehicles may already be impacting the distribution grid and to assist system planning to better prepare for EV growth.

Enrollment application, and participation requirements

Sagewell will implement a white-labeled enrollment application for ENO and can customize application data collected and other requirements. All customer data collected via the enrollment application is stored in US-based servers. Eligibility requirements for participation and earning incentives will be customized based on ENO needs, as needed.

Customer support systems

Sagewell will implement an ENO-specific customer relationship management (CRM) system, and program support channels, including a local or toll-free telephone number and email address. All customer engagements will be maintained in these systems.

MARKETING, RECRUITMENT AND ENROLLMENT

In coordination with ENO program and marketing staff, Sagewell will help develop and implement program branding and marketing. The Bring Your Own Charger® program will be offered on a Sagewell hosted website with ENO-specific design, color palette, and language. Additionally, leveraging Sagewell's years of experience in EV marketing, we will assist in the development of marketing messaging and materials for program outreach.

Direct ENO outreach (via email, bill insert, direct mail) to households that are identified by the EVFinder[SM] algorithm will be the primary outreach method. This algorithm uses system-wide AMI meter data to detect EV charging signatures and the results can be used to market the program directly to homes with EVs. This has been a very effective way to identify EVs that are most impacting the distribution system and to shift their charging to off-peak hours.

Once an EV driver decides to participate, they will visit the program website and complete three simple steps:
1. Program vehicle's onboard charging timer to charge only during utility defined off-peak periods.[1]
2. Take a picture of the vehicle's charging schedule using a smartphone.
3. Upload the picture as a part of the 7-minute online enrollment application.

After applications are received, Sagewell verifies eligibility, charging schedule, and begins monitoring AMI data for EV charging behavior.

EV CHARGING LOAD MONITORING

Utilizing ENO residential AMI data, Sagewell will monitor participant charging behavior and calculate incentives earned using advanced algorithms. This process has been in continual use and development at utilities since 2016, and EV drivers have participated in BYOC for a collective 1 million days so far.

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[1] Charging timers are a standard feature in electric vehicles.

The monitoring process will capture:
- Number of charging sessions
- Total charging hours
- On-peak / off-peak charging
- Estimated kWh used
- Incentive amounts
- Payment history (if bill credits are not available)
- Individual and aggregate off-peak compliance rates
- Individual and aggregate charging session data

EVALUATION, MEASUREMENT & VERIFICATION (EM&V)

Sagewell will utilize ENO's AMI data to monitor customer charging behavior and calculate incentives. As part of Sagewell's QA processes for enrollment and customer monitoring, we evaluate the progress and status of BYOC on a regular basis. BYOC program performance is monitored in near real-time. This allows us to engage with participants who are charging on peak and help them reschedule their EV or troubleshoot issues. ENO staff can see program performance data via our reporting platform and continuously learn new insights about EV charging and EV adoption.

DATA MANAGEMENT & REPORTING

ENO smart meter data will be monitored for EV charging and stored in encrypted US-based AWS servers. Customer enrollment, participation, and other data is stored in secure Google Cloud databases. We will provide ENO access to dashboards to allow self-service analysis and reporting for participating customers. Sagewell utilizes utility-specific SFTP (secure file transfer protocol) servers for data transfers and there is no commingling of data between different utilities. All data is maintained in the U.S. Sagewell can set up processes for regular and ad hoc reporting. In addition to incentive payment history, Sagewell's data reporting platform will contain energy savings, peak compliance, and other energy-based statistics and reports.

BUDGET AND VALUE CALCULATIONS

Bring Your Own Charger® (BYOC) Pilot Program budget is below. The following budget represents the maximum budget, assuming full enrollment and maximum customer incentives. The budget is structured with a significant portion at-risk, based on program performance, with 42.8% of the program administration costs at-risk.

	Program Year 1	Program Year 2	Program Year 3	Total
Program Administration	$110,000	$95,400	$101,040	$306,440
Marketing Support	$10,000	$10,000	$10,000	$30,000
Incentive Processing Fee (at-risk)	$4,200	$8,400	$12,600	$25,200
Per Vehicle Success Fee (at-risk)	$37,500	$75,600	$113,400	$226,500
Total Program Admin Costs	**$161,700**	**$189,400**	**$237,040**	**$588,140**
Customer Incentives	$29,100	$58,800	$88,200	$176,100
EM&V	$7,956	$10,350	$13,563	$31,869
Overall Program Costs	**$198,756**	**$258,550**	**$338,803**	**$796,109**

Based on Unforced Capacity (UCAP) values provided by ENO, and a coincident peak load reduction per EV of 1.5kW, the BYOC Pilot Program has a three-year Total Resource Cost (TRC) of 0.42. This is due to the relatively small size of the pilot. The TRC of the program will improve as customer enrollment grows, and the fixed administration costs become a smaller percentage of the total budget.

However, there are other benefits that are not taken into account with this calculation. The goal of BYOC is to shift EV charging energy to off-peak hours every week day. This does not reduce overall kWh consumption but can have a significant impact on distribution system health and save ENO customers money by enabling ENO to procure energy at lower off-peak hour costs. EV charging, particularly at 10kW and above, can negatively impact neighborhood level power quality and may overload transformers. While immediate transformer failures or damage due to overloading are rare, shortened transformer life can result from frequent overloading, and increase the utility operating costs due to premature equipment replacement. Because BYOC effectively shifts high charging rate EV load to off-peak hours every day, it mitigates potential infrastructure stress and can improve neighborhood power quality. The estimates for equipment replacement cost reduction, avoided operations costs and the value of avoided outages are not available at this time, however the BYOC program will enable ENO to collect the data to better estimate the value of these benefits in the future.

While ENO has provided values for the avoided cost of energy, those values use an average avoided cost of energy and they do not differentiate between the higher peak hour costs and lower off-peak hour costs of energy. By shifting EV charging to off-peak hours, ENO may benefit from lower cost of power during off-peak times. The average EV driver uses approximately 3,000 kWh per year. Using ENO-provided avoided cost of energy of 3.17 cents per kWh over the 3 program years, a 1 ¢/kWh reduction in off-peak energy costs would result in $30 per year in additional value per vehicle, or $63,000 over the three program years. In this scenario, the TRC of the three-year pilot would increase to 0.52.

1. **Cost-Effectiveness of the Electric Vehicle Demand Response (EV DR) Pilot**

The procedures for cost-effectiveness testing of Energy Smart programs are well-established and use the Total Resource Cost (TRC) test from the California Standard Practice Manual (SPM). When extrapolating the cost-effectiveness of the Pilot to a future, more widespread implementation, the following additional parameters need to be accounted for:

a. **Drop-off of fixed costs:** The initial development of the EV DR Pilot will entail higher fixed costs for the recruitment of the initial Pilot cohort. The Pilot period will assist in development of program infrastructure that will be usable for future full-scale program implementation.
b. **Annual recruitment level at full-scale program implementation.** With this target in mind, extrapolation of pilot findings to full program implementation will account for increased benefits and economies of scale when expanding the program. For illustrative purposes, we assume full-scale recruitment of approximately an additional 300-400 customers annually.

With these parameters in mind, cost-effectiveness testing of full-scale implementation of an EV DR program will be calculated as follows:

a. **TRC of the Pilot in Year 1:** This calculation places the full upfront costs of recruitment in Year 1, as demonstrated in the TRC and UCT values provided herein. These scores assume a 10-year Effective Useful Life.
b. **TRC of the pilot in a subsequent program year, if kept at pilot scale:** This calculation accounts for the drop-off in fixed program costs associated with initial program development and assumes that the program recruits the same number of customers annually. This would assume a new group of 300-400 customers recruited annually, credited each year with a 10-year measure life.
c. **TRC of expanded program implementation:** This calculation provides the cost-effectiveness of administering the program at an expanded scale. The energy and demand savings from pilot participants will be extrapolated to future participants in terms of percent of annual usage saved. The annual percent savings from pilot participants will be multiplied by ENO's annual average residential energy use, and then multiplied by the target number of customers to be recruited.

Item (c) detailed above will provide a more accurate representation of cost-effectiveness findings after expansion to full-scale implementation. With this in mind, full-program cost-effectiveness would be estimated using:

a. Marginal upfront costs associated with recruitment of an additional 100 residential accounts to scale the program from Pilot to full-program scale in Year 2;
b. Estimates of program cost reduction once the effort to establish program infrastructure is complete; and

c. Extrapolation of Year-1 pilot findings for per-customer kWh and kW reductions (denominated by percent of annual use and percent of peak use) to a program comprised an additional 300-400 accounts per year.

The extrapolated values will reflect the life cycle cost-effectiveness of administering a full-scale EV DR program over a program cycle.

2. EM&V Methods

Savings from the EV DR Pilot will be evaluated using the following data sources:

a. **ENO billing data.** The primary data analysis will be based on billed use recorded by ENO. Impact analysis of DR events called in the Pilot will be conducted with ENO's AMI data.
b. **Trended data from the EV charge station.** For a household to participate in EV DR, it either has to have a charge station that is connected to internet (e.g., ChargePoint, Clipper Creek) or a vehicle with an open API and access to telematics (e.g., Tesla, Volkswagen). This captures a more accurate representation of the charging load shifted; EV charging is a baseload (not driven by weather); in the absence of submetering of the charge station, there is a risk that the drop in load from EV charging will be subsumed (potentially in entirety) by increased HVAC load. The combination of AMI bills and the charge station trended data allows for identification of the load curtailed while addressing the remaining load from the home entirely and will be used to identify the extent to which access to the charging trend data is required in order to allow for accurate evaluation of EV DR at full-program scale at a later date.

3. EM&V Results

The following considerations need to be taken in addressing the EM&V results:

a. **Summer peak events.** Events that occur in summer may occur during hours without EV charging (such as while the participant is at work). Further, if Entergy initiates time-of-use rates, those rates very often in of themselves push EV charging outside of a system peak window. ADM will analyze summer event results and benchmark these event hours based on their likelihood of occurring during "on peak" hours from TOU / EV rates by other utilities.
b. **Winter peak events.** EV charging is likely to produce similar results in winter versus summer, with differences being based on time of day rather than season type.
c. **Analyzing results by charge station versus telematics control.** The evaluation will consider what type of control algorithm is being applied. Vehicles with open APIs can be easier to register into demand response, as they are still controllable even if the homeowner has a non-networked charge station or simply uses a 220V outlet. Analysis will subset between these two categories to allow for separate benefit-cost testing of the two approaches.

THIRD PARTY EVALUATION PLAN FOR THE ENERGY SMART PORTFOLIO FOR PROGRAM YEARS 13-15 (2023 TO 2025)

SUBMITTED ON: JULY 29, 2022

SUBMITTED BY: ADM ASSOCIATES, INC.

In **ENC◉LOR**

MDRG

ADM

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ADM Associates, Inc. (ADM) would like to acknowledge the many talented individuals who contributed to this evaluation, measurement, and verification (EM&V) Plan for the next triennial period.

The Entergy New Orleans staff participated in ongoing evaluation deliverable reviews and discussions, attended regular meetings, and responded to follow-up questions, data requests and document requests. They are an ongoing partner in our evaluation efforts.

We also wish to thank the implementation firms: APTIM, Franklin Energy Services, Bidgely, Honeywell, Energy Wise Alliance, Green Coast Enterprises, and their staff for their insights and information.

Additionally, we would like to thank the evaluation staff who supported the creation of this report.

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ACRONYMS/ABBREVIATIONS

Table A-01 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

kWh	Kilowatt-hour
LCDR	Large Commercial Demand Response
LCIS	Large Commercial & Industrial Solutions
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
SCIS	Small Commercial & Industrial Solutions
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

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 SUMMARY

1.1 Overview

This evaluation measurement and verification (EM&V) plan provides a summary of the evaluation effort of the Program Year 13 ("PY13") (2023), PY14 (2024) and PY15 (2025) Energy Efficiency (EE) and Demand Response (DR) portfolio by Energy New Orleans (ENO). The Energy Smart Programs are administered between January 1, and December 31 each year. The evaluation will be led by ADM Associates Inc., but in partnership with MDRG and Encolor, LLC. (herein known as "the Evaluators").

1.2 Evaluation Objectives

The following activities will be performed in the EM&V effort:

- Verify program tracking data and correctly apply the most up-to-date New Orleans Technical Reference Manual (NO TRM) to calculate savings and estimate 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) values, which are performed following the NO TRM 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 commercial and industrial (C&I) efficiency programs and no process evaluation of the residential programs and behavioral programs.

1.3 Energy Smart Portfolio Overview

The Energy Smart portfolio included the following programs. The table below shows each program's sector, type, and implementing contractor for ENO.

Table 1-1 Energy Smart Portfolio of Programs

Program Name	Sector	Type
Home Performance with ENERGY STAR®	Residential	EE
Income Qualified Weatherization	Residential	EE
Multifamily Solutions	Residential	EE
AC Solutions	Residential	EE
Retail Lighting and Appliances	Residential	EE
NOLA Wise School Kits and Outreach Program	Residential	EE
Appliance Recycling & Replacement Pilot	Residential	EE
Behavioral	Residential	Behavioral
EasyCool Bring Your Own Thermostat	Residential	DR
Electric Vehicle Charging (Pilot)	Residential	DR
Peak Time Rebate (Pilot)	Residential	DR
Small C&I Solutions	C&I	EE
Large C&I Solutions	C&I	EE
Publicly Funded Institutions	C&I	EE
C&I New Construction Solutions	C&I	EE
Large C&I DR	C&I	DR

The Energy Smart portfolio comprises energy efficiency (EE), demand response (DR), and behavioral programs which provide a comprehensive range of customer options.

These programs were designed to achieve the following objectives:

- Ex post gross energy savings (kWh) goal and a demand reduction (kW) target;[1]
- Significant energy-savings opportunities for all customers and market segments; and
- Broad ratepayer benefits.

The programs are described below.

- **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. HPwES will offer multiple 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 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 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:** 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

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

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.

- **AC 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 elementary and 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 will encourage early recycling of low efficiency appliances, such as refrigerators and freezers, for residential customers. The program 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:** The program will send residential customers a monthly Home Utility Report that compares them to similar and efficient households, shows their disaggregated 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.

  The BYOT program will coordinate marketing activities and DR dispatch of the DLC switch population alongside recruitment and DR dispatch for the program.

- **Electric Vehicle Charging (Pilot)**: The EV Charging Pilot will provide incentives for residential customers to enroll their Level 2 EV charge station in summer and winter season load control. This Pilot is in development and program details are not yet available.

- **Peak Time Rebate ("PTR") (Pilot)**: The PTR Pilot will provide voluntary demand response via email and text notification to enrolled customers.

- **Small C&I Solutions:** This offering will provide 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 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 a solution 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 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.

The evaluation approach for each program is found in the section below.

2 EM&V METHODOLOGY

2.1 Gross Impact Approach

The key steps in gross impact evaluation are summarized in the subsections to follow.

The various activities involved in the EM&V effort are as follows:

- QA / QC of program applications / projects;
- Tracking and verification of measure installations; and
- Measurement of savings impacts for measures / projects.
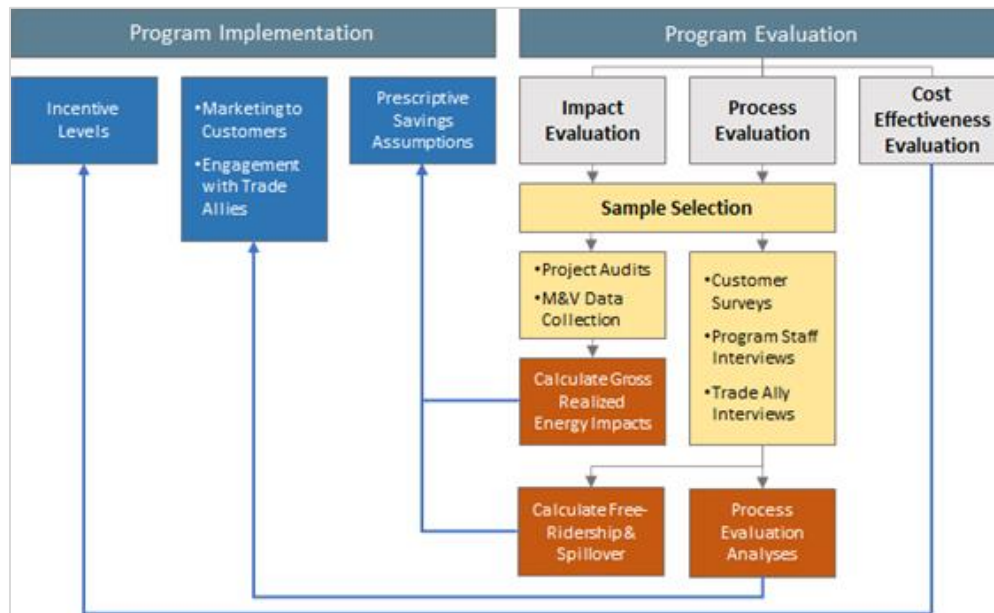
Figure 2-1: Integration of EM&V Activities with Program Planning and Implementation

2.1.1 DETERMINE SAVINGS ANALYSIS PROCEDURES FOR PROGRAMS

For each program's M&V plan, we determine the savings analysis procedures for the measures in the program. We examine documentation for each program to identify the types of energy efficiency measures from which savings are expected to be realized.

A taxonomy presented in the *Model Energy Efficiency Program Impact Evaluation Guide* identifies three major approaches for calculating estimates of energy savings and demand reductions.

- A deemed savings approach involves using stipulated savings for energy conservation measures for which savings values are well-known and documented and supported by the Iowa TRM.
- A site-specific M&V approach involves (1) selecting a representative sample of customers or sites that participated in a project; (2) determining the savings for each customer or site in the sample, usually by using one or more of M&V Options defined in the IPMVP; and (3) applying the results of estimating the savings for the sample to the entire population in the project.
- A large-scale data analysis approach involves estimating energy savings and demand reductions by applying one or more statistical methods to measured energy consumption utility meter billing data and independent variable data. This approach usually (a) involves analysis of a census of project sites versus a sample and (b) does not involve onsite data collection for model calibration.

2.1.2 SPECIFY CRITERIA FOR SAMPLING PLANS

Evaluation of EE programs requires solid data on important customer attributes. Data collection is a critically important core element of our program evaluations. Great care is taken in choosing samples of customers for the analysis and in collecting data on the characteristics of these customers.

The sampling must provide results that meet a ±10% precision at a 90% confidence level for the final EM&V reporting. We determine sample sizes for each program that meet the precision / confidence requirements and that fit the size of the effects produced by a program rather than using a fixed sample size for all programs in a portfolio. This can significantly reduce costs without overly compromising overall accuracy. If measures being installed produce very similar results and the resulting outcomes are known to be of low variability, then smaller sample sizes can be chosen because the results will fall within a narrow confidence interval. On the other hand, if the effects being produced are of unknown size or likely to be highly variable, then larger sample sizes may be needed to produce narrower confidence bands.

2.1.3 SPECIFY REQUIREMENTS FOR MEASURE INSTALLATION VERIFICATION

To ensure that the verification process is performed smoothly, we develop a set of protocols that address coordination between the evaluation and the implementation teams. This will provide adequate documentation for the installed measures. Some of these documentations could include pictures, marking and coding, indicators for location of incented measure relative to other non-incented measures. We work with ENO and their TPA to set these protocols, based on the type of the program and measure. We also specify when and how sampling at a site will be required to complete verification (e.g., lighting in multi-story office buildings, guest rooms in hotels / motels).

The protocols detail how visits are scheduled and how customers are contacted. Specifications are provided for the forms to be used for documenting the on-site verification and for where, when and how photographs are taken to document verification. The forms are also used to identify discrepancies between expected and observed quantities and measures.

2.1.4 SPECIFY REQUIREMENTS FOR PROGRAM DATA TRACKING

We will assess the program tracking systems (either administered directly by ENO or by their TPA) for accuracy, consistency, and completeness of data. We will perform a series of checks to ensure data are consistent and will perform test queries to ensure they are being populated accurately. This is followed by an assessment that addresses whether the data are sufficient for use in assessing program impacts and regulatory reporting requirements. We acknowledge that changes to data tracking systems can be costly and time-consuming, so any recommendations made pertaining to tracking data system updates will include detail of the estimated benefits and costs of implementing the recommendation (where quantifiable).

2.1.5 SPECIFY DATA COLLECTION REQUIREMENTS

An important objective in performing impact evaluation is to minimize the error in the estimates of energy impacts. In general, referencing participant-specific primary data will allow for more accurate estimates than referencing secondary data. That said, it is often appropriate to reference service territory-specific or secondary data to calculate realized energy impacts.

Identifying when to collect primary data and when to reference secondary data involves assessing the costs and benefits of varying scopes of data collection. For a given level of EM&V resources, the resources used for collection of primary data should be targeted to achieve the greatest possible reduction in uncertainty while

also achieving other evaluation objectives. Figure 2-2 graphically demonstrates the incremental cost and benefit associated with data collection.
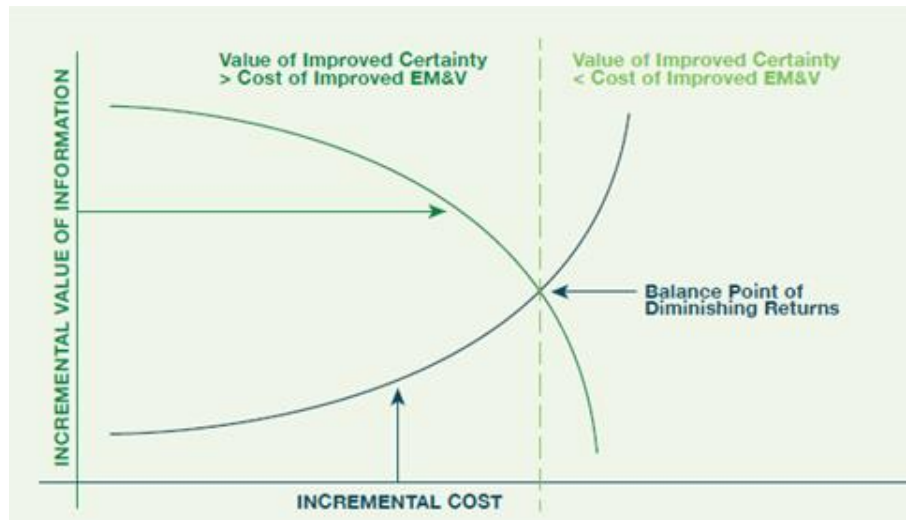
Figure 2-2: Incremental Cost and Benefit of Data Collection

In practice, the optimum level of primary data collection is a function of several factors, including prevailing policy preferences and technical considerations.

2.1.6 CUSTOMER SURVEYS

The designs of surveys are specific to the utility, sector, program, and who is targeted. Surveys can be administered four ways: in-person, via phone, on-line or by mail. The first three methods can use the same instrument and delivery. All surveys will be conducted in accordance with practices detailed in the research plan. This will include instructions on:

- Timing for contacting participants (each attempt on a different day of the week and time of day);
- Handling of "soft refusals";
- Number of attempts to make per participant;
- Appropriate mapping of primary versus back-up contacts; and
- Defining the sample frame and strata with quotas for each stratum.

We will provide email text and telephone scripts for review and comment. We also provide advanced notification of survey administration.

2.1.7 ON-SITE DATA COLLECTION

Site visits are used when an enhanced level of rigor is required. On-site data collection includes data logging, spot measurements, and interview surveys. Additionally, on-site observations can include measure settings or operating parameters. Equipment is photographed on-site, and photo filenames are generated using the measure, site ID, and date to assist in searching the photos.

Some items and approaches will be consistent across data collection plans used to collect on-site data. The data collection plan template addresses:

- Name of the measure and sector for the data collection;
- Category of data collection type;
- Lists of the parameters to be collected;

- Are the data static or time varying (list time interval if varying);
- Will the data collection require field work;
- What rigor level is required;
- List the required sample size;
- List recruitment methods for participants (and non-participants, if applicable);
- List who is responsible for the data collection;
- When will the data collection start/end;
- How will the data be stored;
- Who needs to be contacted to obtain the data;
- Does the data need to be requested? How long will the request take; and
- Does the data need to be collected more than once, and if so, how often and when?

2.2 Net Impact Approach

The Evaluator will collect primary data for net-to-gross (NTG) assessment, with the following exceptions: 1) programs that do not claim savings or contribute very little to portfolio savings; 2) other factors justify a deemed savings value; and 3) savings are assessed via billing analysis. As discussed below, we will combine data from survey responses about equipment implementation that did not receive incentives or other program support with data from contractor surveys to assess program spillover.

Table 2-1 summarizes our proposed approach to net savings analysis by program, as detailed in the following sections.

Table 2-1 Summary of Net Savings Approaches

Program	Free Ridership (FR)	Spillover
NTG Research		
Downstream Programs	Self-report	Survey research to capture further activities taken
Midstream Programs	Self-report for non-lighting measures[1]; for lighting, either self-report[1], demand modeling, or common practice baseline	
DR Programs	No FR impacts – counterfactual captured in baseline development	
No NTG Research		
Behavioral Program	Billing analysis provides net savings via control group	

By participants identified in tracked sales (for point-of-purchase rebates or online discounts).

2.2.1 NET-TO-GROSS OVERVIEW

The Evaluator will follow the industry practice of not assessing free ridership for demand response programs, as their usage counterfactual is captured in the baseline development (either by prior-day matching or use of a control group with same-day data). We will, however, assess spillover in DR programs. The important issue for participant spillover is whether the participation in the program influenced participants to engage in other energy-saving activities without further program inducements. It is possible that engagement with called events could influence the participants to engage in further energy-saving activities. We have seen this occur most often in commercial demand response programs, where the DR service providers active in a program

are also providers of retrocommissioning services. Therefore, we propose to assess participant spillover for DR program participants, using the methods described below.

Finally, we will not conduct independent NTG research for programs for which savings are established through a billing analysis (such as Behavioral), as the billing analysis itself provides the net savings, as noted in greater detail below.

We also may use NTG values established through primary research if that research was done recently (e.g., within the past two years) and we determine the methodology was appropriate and the results were reliable.

We will use primary data collection to assess NTG for all other programs.

Below, we describe the types of net savings approaches identified in the table. The program-specific evaluation approaches in subsequent sections include additional information on the approaches that we will use for each program.

2.2.2 NET-TO-GROSS APPROACHES

Net savings approaches generally can be divided into those that rely on self-reports about energy-related decisions, those that incorporate market data, and experimental and quasi-experimental approaches.

2.2.3 SELF-REPORT NET-TO-GROSS APPROACHES

Self-report approaches can be used for both free ridership and spillover assessment. Self-report free ridership assessment primarily relies upon responses from program participants, although – as described below – it may also incorporate input from contractors or other trade professionals as needed. For downstream programs, we identify participants from program records. For upstream and midstream programs, we identify likely participants by asking general population survey respondents about their purchases.

Free Ridership Assessment self-report uses customer surveys or interview responses to develop an estimate of savings that would have occurred absent the program. In our approach, we collect data on contextual factors that influence customers' decisions in addition to customers' perceptions of program influence to estimate free ridership. This approach contrasts with other approaches that rely on the use of customers' numeric ratings of program influence, program components, and the likelihood of installing the measure in the absence of the program to estimate program influence. While these approaches are conducive to generating numeric estimates of net savings because they base the net savings score on participant numeric ratings, they also have some limitations. One limitation is that they are subject to errors that result when customers are directly asked to guess at what their behavior would have been under a different set of circumstances or to estimate how much a program influenced their decision. These types of questions may be more challenging for respondents to answer than questions focused on the circumstances surrounding the decision.

In our approach, we ask customers questions about the circumstances around the decision to implement measure. We focus on factors that limit energy efficiency investments that the program may directly address.

For example:

- Would the customer have been financially able to install the measure or allocated the money for the efficiency improvement without the program incentive?

- ▪ Did the customer already have plans to install the equipment before learning of the program or is the program effectively reaching customers who would otherwise not be engaged in making the efficiency improvement?
- ▪ Did the customer have previous experience with similar efficiency measures that demonstrate a familiarity with them? Were they aware that they could save on energy costs before exposure to program informational supports such as energy audits?

We also typically include questions that directly ask customers to estimate the influence of the program and/or their likelihood of taking the same action if the program was not available. Nonetheless, we believe that responses to the questions about the decision-making context provide more information to help program managers make decisions about program design and implementation than responses to rating scale questions.

For some projects, there may be program influences that are not directly observable by program participants. In such cases the participant's response creates an incomplete picture of the program's influence. For example, a contractor's recommendation may have influenced a customer's decision and that contractor's recommendation may have in turn been influenced by the program. In these cases, we propose enhanced self-report methodologies that incorporate self-reports from other market actors in addition to participant self-reports.

Spillover Assessment refers to energy-saving purchases or actions that result from program influence but did not receive direct program support, such as incentives. This can occur both with participants and nonparticipants. Among participants, the program influence typically is understood to be the program participation itself. Among nonparticipants, the program influence could result from program marketing or outreach, including engagement with program representatives or trade allies.

Spillover typically is assessed by asking survey respondents (participants or nonparticipants) if they have implemented any efficient equipment in the program administrator's service territory without receiving a program incentive. Respondents that indicate that they did implement such equipment are asked a series of follow-up questions to facilitate estimation of the energy savings associated with the equipment and to assess the program's influence on the equipment implementation.

There are at least two reasons why the above method may result in the underestimation of spillover. First, even if program participation influenced a participant to implement additional equipment, that additional implementation may occur weeks or months after the program participation. Therefore, participants who are surveyed relatively soon after program participation may not report spillover although they may be responsible for some later within that program year. It is easy to see that this is likely to minimize spillover that is assessed through a Fast Feedback approach.

Second, asking respondents to rate program influence assumes that the influence is direct and observable by the respondent. In fact, program influence on both participants and especially nonparticipants may be indirect, via the distributors and contractors who work with the customers.

To address the above concerns, the Evaluator will use an innovative approach that uses both customer (participant and nonparticipant) and trade ally (distributors and contractors) feedback to assess the program's *indirect* influence on identified energy efficiency upgrades. The approach asks customers to assess the influence of the program *and* the influence of trade allies on their un-incented purchases and asks trade allies to assess the influence of the program on their efforts to sell program-qualifying equipment. The

program indirect influence is the product of the program influence on trade allies and the trade ally influence on customers. This approach uses trade ally survey data to estimate the quantity of un-incented equipment installed. Therefore, it does not suffer from the under-estimation that may come from relying on participant reports occurring shortly after program participation.

The Evaluator implemented this method for several years to assess lighting-related spillover in our work for Ameren Missouri. This method demonstrated that program indirect influence often is greater than program direct influence. Even with multiple mechanisms to produce conservative estimates, it produced spillover rates that were substantially higher than traditional methods.[2] The method was successfully applied to a contractor-driven residential heat pump program.[3]

2.2.4   MARKET-DATA NET-TO-GROSS APPROACHES

The Evaluator may use consumer demand modeling and/or a common practice baseline approach, as appropriate, to supplement self-report approaches.

Consumer Demand Modeling is used to estimate net savings from residential midstream lighting and exploits fluctuations in the number of lamps sold through a program and the variation in pricing of lamps to estimate a relationship between the price of the lamp and the sales volume.

Common Practice Baseline Approaches use information about typical equipment purchases and energy saving actions to estimate net savings. There are, however, some limitations in using common practice baselines to develop quantitative estimates of program net impacts. It is difficult to infer what a small group of participants in a program would have done had the program not been available from what a larger population is doing in general. That is, program participants may differ in some way from the general population in terms of willingness to make investments in energy efficiency.

Nevertheless, understanding common practice does provide important information for program planning by providing data for assessing free ridership risk and understanding which measures are less broadly adopted in the market. Consequently, understanding common practice can help program managers make decisions about program design and implementation strategies.

2.2.5   BILLING ANALYSIS WITH EXPERIMENTAL OR QUASI-EXPERIMENTAL DESIGN

The third general approach to assessing net savings is by comparing the energy use (via billing data) of a group that receives a program intervention to that of a group that did not receive the intervention. The preferred design uses random assignment of customers to receive or not receive the intervention. With this design, the difference in energy use between the treatment and control groups can be assumed to be an unbiased estimate of the net program effect.

Quasi-experimental designs are commonly employed in cases where the participants volunteer to receive the program intervention. A common form of quasi-experimental design is to use a control group developed by matching the treatment group to customers that did not receive the intervention and are similar in terms of

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2   Bliss, R., N. Sage, and D. Diebel. 2017. "Not all Spillover Is the Same – So Don't Treat It That Way!" *Making Ambitious Reductions Real: Accurate and Actionable Evaluation*, Baltimore, MD: International Energy Program Evaluation Conference, August 2017.

3   Bliss, R. and M. McClaren. 2018. "Avoiding Being (Too Much of) A Victim of Your Own Success: Mitigating Free-ridership Losses Through Better Spillover Assessment." International Energy Policy and Programme Evaluation Conference, August 2018.

known characteristics. In many cases this approach can result in a reasonable NTG estimate. However, this approach can overestimate program-induced savings when there is broad awareness of the program, participation is easy, and enrollment is not significantly constrained by budget limitations. In these cases, most of the population who would implement the measures in the absence of program support are also likely to enroll in the program.

Whether the billing analysis is done within an experimental or quasi-experimental design depends entirely on how the program is implemented.

2.3 Process Evaluation Approach

The Evaluator will conduct a thorough process evaluation to identify program strengths as well as areas for potential program improvement. As detailed below, the process evaluation will, at a minimum, address all the objectives identified in the RFP and cover all elements of a successful program, including design, staffing, marketing, implementation, delivery, and customer response. An important part of this evaluation will be to identify market barriers that impede the program's reach into all parts of ENO's residential and non-residential markets.

The following subsections present overviews of our approach to process evaluation, followed by information on how we identify and answer important research questions, our data collection approaches, interview and survey implementation, and the timing and cadence of process evaluation activities.

2.3.1 PROCESS EVALUATION OVERVIEW

Our approach to process evaluation for the ENO portfolio will address the overall effectiveness of program activities in overcoming barriers and will provide strategic guidance to assist program improvement. Data collection activities will provide information on the effectiveness of program processes and procedures, including how well the program works with key stakeholders to optimize program operations. To this end, the Evaluator will:

- Review program documentation and interview ENO and TPA staff to understand program goals, rules, and processes - including any coordination with delivery of gas utility programs - as well as to reveal any issues or concerns to be investigated through other process evaluation data collection;
- Interview applicable market actors about their experiences with the program to shed light on the effectiveness of program processes, the communication between ENO and its TPA, marketing activities, customer decision-making, and participation barriers;
- Survey program participants about their experiences, including satisfaction with the program, and their decision-making process; and
- Survey nonparticipants to reveal the level of program awareness and identify barriers to participation.

From the information obtained from the process evaluation, the Evaluator will identify what the programs are doing well and what factors may be preventing the programs from achieving their goals or doing so more cost-effectively. This will help ENO and its TPA better understand the impact evaluation results and make related management decisions.

The Evaluator will use process evaluation best practices, which include:

- Allocating process evaluation resources based on each program's contribution to overall energy savings; evidence of evaluation need (e.g., failure to meet savings goals or unsolicited feedback from customers or

▪ trade allies); changes in program design or implementation; and the recency with which programs had a detailed process evaluation.

▪ Designing all data collection instruments to address specific research questions, ensuring that all needed information is collected, and none is collected that will not or cannot be used.

▪ Presenting the process evaluations results clearly and efficiently, identifying how each interview or survey finding addresses a specific research question. ENO will not have to sort through lengthy descriptions of every survey response trying to figure out the "so what?" of the results.

▪ Providing meaningful high-level conclusions, which will form the basis for clear, actionable recommendations for process improvements where identified.

Where possible, we will seek to achieve the standard level of 90% confidence of 10% precision (90/10) for participant surveys. We note, however, that such a level of confidence and precision is not always feasible, particularly in programs with relatively small participant populations. In the case of market actors, such as contractors, retailers, and distributors, the choice of data collection approach will be driven by the size of the relevant market actor population and the nature of the data to be collected.

Table 2-2 summarizes our preliminary proposed data collection approaches. We will revise this as needed after we obtain greater detail about program participation and trade ally involvement during the project initiation period. We discuss sample size and confidence/precision issues in more detail in Section 2.3.3, *Data Collection Approaches*, below.

Table 2-2 Summary of Process Evaluation Sources, by Program

Data Source	Data Collection Activity
Program Documents & Data	Review all program documentation, (e.g., marketing plans and materials, implementation plans, applications) and project files.
Staff / Implementers	Individual or group interviews with program and implementer staff of each program.
Trade Allies	Omnibus online survey and/or phone interviews, separately for residential and nonresidential sectors.
Participants	Programs with high participation: Program-specific multi-mode surveys, targeting 90/10 confidence/ precision. Programs with low participation: Program-specific phone interviews, trading depth for precision.
Non-participants	Cross-cutting multi-mode residential and nonresidential surveys, with 90/10 confidence/ precision (n = 68) each

2.3.2 IDENTIFYING AND ANSWERING THE IMPORTANT PROCESS QUESTIONS

The Evaluator will use the various information sources – program documentation review, ENO staff and TPA interviews, applicable market actor interviews, and customer surveys – to provide convergent information to address identified research questions. We will make maximally effective use of each source by identifying which sources will provide the most applicable information to each question, as shown in Table 2-3. For example, while ENO and TPA staff interviews likely will touch on most or all research questions, we will rely more heavily on feedback from market actors, participants, and nonparticipants to assess customer service and market barriers. Market actors and program participants will provide important input into most questions relating to program implementation, but they likely will not be major sources of information regarding management tools or cost management. Our assessment of nonparticipants' awareness of the program offerings and reasons for nonparticipation will provide important information relating to program

marketing, participation information, rebates and incentives, and customer service as well as participation barriers.

Table 2-3: Data Sources to Answer Process Evaluation Research Questions

Process Evaluation Research Question	Docs and Data	Staff	Market Actors	Partic-ipants	Non-partic-ipants
Are programs run per design and efficiently/effectively?	✓	✓	✓	✓	
Is staffing/organization sufficient and appropriate?		✓			
Is customer service of high quality, timely, and effective?			✓	✓	✓
Are marketing plans implemented per design and effective?	✓	✓	✓	✓	✓
Are quality assurance procedures appropriate and effective?	✓	✓	✓	✓	
Are management/implementation tools appropriate & effective?	✓	✓			
Are implementation contractors running programs effectively?		✓	✓	✓	
Are program materials effective and complete?	✓	✓	✓	✓	✓
Are costs managed properly and efficiently?	✓	✓			
Are contractors effectively capturing appropriate opportunities and ensuring comprehensive services?		✓	✓	✓	
Are incentives appropriate for meeting program goals?		✓	✓	✓	✓
What are the market barriers that impede program reach?			✓	✓	✓

Beyond identifying the above general process evaluation questions, The Evaluator will deliver a valuable process evaluation by refining and specifying the research questions to address specific issues revealed through thoughtful interviewing of ENO and TPA staff as well as those identified in previous research. For example, we would expect to investigate the following issues identified in our prior evaluations of ENO's programs:

- **The COVID pandemic created changes in work and home occupancy and energy usage patterns.** What originally seemed like a temporary adjustment to reduce risk of transmission may have created more long-lasting changes in work and home life, which could have significant impacts on how energy is used. We will investigate this possibility through both residential and nonresidential participant surveys.
- **The COVID pandemic also created changes in ENO program implementation, including use of virtual home assessments and changes to program QA/QC.** We will assess whether the changes introduced during the pandemic are still in place. If so, we will use trade ally interviews and participant surveys to assess the effectiveness of virtual home assessments in identifying energy saving opportunities and inducing upgrades. We also will assess whether ENO's changes in QA/QC practices (e.g., not sending field technicians into the field) had any impact on realization rates.
- **The COVID pandemic reduced nonresidential program participation.** We will investigate whether nonresidential participation is still depressed and, if so, whether that has affected some subsectors (e.g., schools, hospitals, grocery stores, retail, office) more than others. This information may help ENO determine what types of adjustments are most needed to address nonresidential sector needs as the pandemic recedes.
- **Residential trade allies' satisfaction with the Energy Smart Program was low.** We will assess whether trade allies' comments produced any program changes and, if so, whether that improved satisfaction levels.

- **Most Behavioral Program participants adopted at least one recommended behavior change.** We will seek to provide more detailed information about behaviors adopted, such as whether adoption is driven more by the potential energy savings of the change, the relative ease of adoption, or some combination of the two. As part of this, we will assess participants' understanding of the relative impacts of various recommended changes, what information the program provides about that, and whether the program places more emphasis on high-impact changes or those that can be accomplished more easily. We also will investigate participants' perspectives on the number and range of recommended changes and how the recommendations are delivered to provide information on the most effective delivery strategy.
- **Commercial uptake of the EasyCool Bring Your Own Thermostat Program was low.** We assess what the Program has done to increase uptake and how well that has worked, how aware targeted commercial customer types are of the Program, and what barriers exist other than those related to Program awareness.
- **Some trade allies had installed qualifying equipment without applying for program incentives because "the amount of paperwork and process can be time consuming."** Some evaluation research has found that some trade allies offer discounts to customers in lieu of completing incentive applications. We will investigate whether this occurs in ENO territory. Given that any such discounts are offered specifically in response to program incentives, it could be argued that savings resulting from those discounts represent program spillover.
- **Often kit measures distributed through the Small Commercial & Industrial Solutions Program had low installation rates, with lack of time being the primary reason for non-installation.** We will investigate what measures the Program has taken to reduce non-installation, such as providing better installation information or assistance, elimination of items with low installation rates, or allowing customization of kit requests.

We also expect to investigate the following issues identified in our evaluations of others' programs:

- **Contractors are an important source of program awareness among program participants, while word of mouth and bill inserts are the most common among program nonparticipants.** The relationship between source of awareness and participation status has at least two interpretations, both of which have potential implications for the program. The first interpretation is that the contractors that nonparticipants have worked with are less likely to tell their customers about the program. The second interpretation is that nonparticipants are less likely than participants to have done recent work with a contactor and so have had less opportunity to learn from a contractor about the program. Either interpretation suggests that increasing program participation might be best achieved by increasing outreach to contractors to increase program referrals, but the two interpretations suggest different outreach strategies. Investigating which of these interpretations is more accurate by asking customers about their experience with contractors could help point the program to the correct outreach strategies.
- **Our recent process evaluation of a low-income program pointed to high turnover by weatherization contractors.** This could affect the success of the program not only by reducing the availability of contractors to complete weatherization projects, but also potentially by decreasing the quality of weatherization treatments if many are performed by inexperienced contractors. We will assess whether the turnover rate for the ENO program is high and, if so, whether the turnover rate affects project completion and quality, which could provide the program with information that it could use to reduce turnovers and mitigate the impacts.

Another aspect of identifying and answering the important questions is understanding what is and is not meaningful in evaluation results. In preparing reports, ADM seeks to avoid leaving reviewers thinking, "Tell

me something I don't know." For example, we have seen many reports stating that saving money and using less energy were identified as the top motives for and benefits of program participation. It would be very surprising indeed if this were not the case, as these are exactly what the programs promise and (particularly, decreasing energy use) what the programs are evaluated on. Certainly, it is valuable to determine whether participants did not realize the expected money and energy savings and to report on that if it is so, but it should be the failure to achieve these goals rather than the achievement of them that should be the story. What would be particularly valuable is information on the degree to which other outcomes – comfort, safety, equipment reliability – contribute to the decision to purchase more energy efficient equipment with program assistance. ADM will write the process evaluation reports with these considerations in mind.

2.3.3 DATA COLLECTION APPROACHES: CORE PROGRAMS

The following provides details on the process evaluation data collection approaches we will use.

2.3.3.1 Document and Data Review

We will review available program documents, including program manuals, program logic models, contractor training materials, marketing materials and plans, and application forms to better understand how the program operates and to inform the evaluation design. The review also helps us identify opportunities for program improvement, such as potentially overlooked marketing channels or tactics, or opportunities to streamline or expand application forms to collect needed data.

Reviewing any program logic models will help ensure our understanding of each program's objectives and how the program's activities are expected to achieve those objectives. The logic model review will be a process evaluation end in itself – we will provide feedback on how well the model explains and describes the program theory – but it also will guide data collection and interpretation. In turn, our data collection activities may provide feedback to revise a model to better reflect the realities for that program.

We also will review project tracking data, which is a valuable resource for understanding how the program is performing and the market response. A review of the data system can also verify that the data are sufficient and complete enough to support program management and evaluation.

2.3.3.2 Program and Implementer Interviews

We will conduct in-depth interviews (IDIs) with program management staff to fill out our understanding of program design, goals, processes, and marketing strategies; to assess communication and coordination between ENO and its TPA; to get ENO's input on its TPA performance; to gain insight into quality control and assurance processes; to identify challenges that the programs have encountered and how those challenges have been addressed; and to clarify evaluation goals and research questions.

Senior evaluation team members will conduct the IDIs using semi-structured interview guides (see Instrument Development, below).

2.3.3.3 Market Actor, Participant, and Nonparticipant Surveys

We will conduct either telephone or web surveys with market actors, program participants, and nonparticipants. We anticipate conducting surveys as telephone, web, or mixed phone/web surveys. We typically will conduct web surveys with email invitations, but we also use mail or postcard invitations to take web surveys. We have used the latter when email addresses were not available or, in some cases, as an adjunct to the email invitations.

The selection of survey type will depend on the nature of the target audience, the anticipated challenges in reaching customers by various methods, and the nature of the information to be collected. Decreasing response rates to residential phone surveys over the past several years have made web surveys a more cost-effective approach for residential target audiences. Response to web surveys also have declined in recent years; thus, we will consider and recommend other modes as appropriate.

We still obtain good response rates to phone surveys of most nonresidential target groups, including market actors. Further, phone surveys are valuable when discussing more technical issues that may require clarification or when contacting larger customers, when the contact identified in project records is not necessarily the best respondent for an organization. Thus, we will consider phone surveys, as appropriate, with these groups.

2.3.4 MARKET ACTORS

In the case of market actors, such as contractors, retailers, and distributors, the choice of data collection approach will be driven by the size of the relevant market actor population and the nature of the data to be collected. However, as noted in Table 2-2, above, we anticipate a combination of online surveys and phone interviews.

2.3.5 PARTICIPANTS

For some programs, it likely will not be feasible to achieve 90/10 sample sizes due to small participant populations. For programs for which obtaining a 90/10 participant sample is not feasible, we propose a combination of online surveys, supplemented with in-depth interviews with selected participants. The latter may include those who did not respond to the online survey and/or those who indicated any dissatisfaction in the online survey. In the case of programs with very small participant populations, we may attempt a census of participants.

In developing any sample, we will ask ENO for a list of customers that had been selected for another survey within the previous year, if available, to scrub the sample frame of such customers. When sample development overlaps for two or more surveys, we will allocate the overlapping customers to one or the other sample to ensure that no customer is recruited for more than one survey (or, in the case of influential, "must-have" customers, that they are included in all important survey efforts in a manner that minimizes survey and EM&V burden to the customer).

2.3.6 NONPARTICIPANTS

We will conduct separate cross-cutting nonparticipant surveys of nonresidential and residential customers, targeting 90/10 confidence/precision for each survey. As with participant surveys, we anticipate a mix of online and phone surveys, possibly including mailed recruitments to take the online survey. We have found that a letter recruitment with a link to an online survey was an effective adjunct to other recruitment methods.

2.3.7 INTERVIEW AND SURVEY IMPLEMENTATION

The Evaluator will conduct all interviews and surveys using in-house resources. Our senior staff have broad and deep experience interviewing ENO and TPA staff, and the Evaluator carries out dozens of phone, web, and mail surveys each year. The Evaluator's in-house dedicated call center is staffed with a full-time manager and both English- and Spanish-speaking professionals. As-needed, the Evaluator has completed surveys in additional languages including Mandarin and Vietnamese. Since 2015, our call center has handled an average

of about 180 surveys a year with market actors, program participants, and nonparticipants, with about 12,000 survey completions overall.

2.3.8 INSTRUMENT DEVELOPMENT

We will develop all interview guides and survey instruments to address research questions identified in the Plan, during project initiation, or in ENO and TPA staff interviews and with a mind to the analyses to be performed. The evaluation plan will document the research questions specific to each data source, which will guide the process for developing each instrument. This will ensure that the research questions for each instrument will already have been vetted and discussed with ENO.

We will provide a crosswalk between the vetted research questions and each interview or survey item when we submit the draft instruments to ENO. This will ensure that there is no question or confusion about the purpose of any given item. Providing ENO staff with a clear understanding of the purpose of each item in the instrument will enable them to provide focused feedback on those items. We will revise each item as needed based on the feedback received.

2.3.9 SURVEY PROGRAMMING AND TESTING

We will program all surveys, both phone and web, using an industry-standard survey platform, Qualtrics. The platform is widely used by professional survey research and evaluation firms and supports web, telephone, and dual-mode survey administration. It offers sophisticated programming features for developing user-friendly interfaces and offers a range of options for response validation and display logic. It also provides controls for preventing duplicate or ineligible submissions and allows the option of completing surveys in multiple sessions. It provides the ability to allow respondents to select the survey language as well as the ability to embed screener questions in email invitations.

We will test each survey to ensure that all questions and responses are included and worded correctly, and all input and display logic works correctly. The program lead will assess the look and feel of the survey (size of font, amount of white space, location of page breaks, and so forth) and will provide suggestions for improvement, if needed.

Once each survey is programmed, we will carry out a soft launch of a small subsample (if the program population is sufficiently large) as a second check to ensure the survey programming is correct as well as to determine whether any questions are not well understood or should be revised for any other reason.

2.3.10 SURVEY RECRUITMENT

We will prepare telephone and email recruitment scripts. These materials will include several well-known elements, such as personalizing the message, stating the intended use of the responses and the importance of everyone's response, making a personal appeal, and so forth. They will provide the name of an ADM evaluation staff contract to answer questions about the survey. If ENO so desires, they also will provide an ENO contact to provide *bona fides* or answer questions. Email recruitments also will provide a call-in number for customers who would like to complete the survey by phone.

We also will include proven-effective language in the recruitment scripts that ADM's staff developed for use in survey recruitment, based on language used in public radio pledge drives. The key to the "pledge drive" language is asking the recipient if he or she "can be one of the people who help of achieve our goal" number of responses. This language has been shown to increase response rates to online surveys above and beyond

what is accomplished through the elements described above.[4] We hypothesize that it does so because it frames the request in the context of group or collective action, thus inhibiting thoughts that undermine self-efficacy (e.g., "what difference can my actions make?"). In this sense, it may be related to the concept of "collective efficacy."[5]

In recruiting for both phone and email surveys, we will follow additional protocols to attempt to maximize response rates and reduce customer burden. We will carry out multiple recruitment attempts but will space them to provide adequate opportunity to respond to each one before sending another. We have found that making more than three phone attempts yields quickly diminishing returns but that multiple email recruitment efforts, when spaced adequately and when using the pledge drive language, can generate continued responses with only a moderate decrease with each effort. We also have found that switching recruitment modes (e.g., from email to phone to post card) can reduce response decrement or even generate an increase in response.[6]

When feasible, we will send advance email or mailed notice of telephone surveys to customers. These will explain the purpose of the survey and addresses frequently asked questions. As with the email recruitments for web surveys, the notification will include contact information to obtain additional information about the survey or participate by telephone.

We will use survey completion incentives when needed to increase response rates. Typically, a small incentive of $5 or $10 is effective at increasing in response rates among residential customers, with increases in response rates offsetting incentive costs. When surveying market actors, a larger incentive of $25 to $50 often is needed.

2.3.11 CONDUCTING TELEPHONE SURVEYS

The call center manager, working with evaluation staff, will provide call center staff thorough project-specific training for each survey. This will cover the basics of the program that the survey addresses, the group that the survey targets, and the purpose and use of the survey and of each question. Our callers our experienced in surveying about a wide range of energy efficiency program types and with an equally wide range of target audiences. Nevertheless, we take every new survey as an opportunity to review and reinforce their understanding of these programs and audiences. Training will include a question-and-answer session as well as practice surveys.

During the survey fielding, the call center manager will monitor callers to ensure quality and provide feedback to callers. For each survey, the call center manager will reiterate a standing directive to the callers to provide feedback on the survey instruments, including any challenges they have understanding or being able to ask the questions and any challenges respondents have in answering them. The call center manager

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4 J. Loomis, E. Focella, A. Weaver, and R. Bliss 2019. "Increasing Response Rates to Web Surveys: No Tote Bag Required." Informing Innovation: Research and Evaluation in a Changing Energy Landscape, Denver, CO: International Energy Program Evaluation Conference, August 2019.

5 A. Bandura. 2000. "Exercise of Human Agency Through Collective Efficacy." Current Directions in Psychological Science, June 2000.

6 Bliss, R. and D. Rubado. 2020. "Increasing Program Participation in Underserved Groups: The Value of a Nuanced Understanding of Demographics, Awareness, and Attitudes." Behavior, Energy & Climate Change Virtual Conference. December 7-9, 2020.

immediately provides this information to the evaluation survey lead, who can then determine whether to reword a question or provide additional clarification to the caller.

2.3.12 TIMING AND CADENCE OF PROCESS EVALUATION ACTIVITIES

The review of program documentation will occur first, as it – together will discussions during project initiation – will provide the understanding of the programs, form the basis for our draft evaluation plan, and will inform all later data collection. We will request all applicable program documentation during the project initiation period.

Early in the PY12, we will conduct in-depth interviews (IDIs) with program staff to ensure we fully understand the program rules and processes and staff's expectations for and concerns about the programs and the evaluation. This will help us to identify research questions to address through market actor and customer (participant and nonparticipant) interviews and surveys. We will then check in with program staff in late PY12/early PY13, and again late PY13/early PY14 to find out whether anything has changed, to gain a sense of how the programs are progressing, and to identify any new issues or concerns. This will allow us to devise appropriate questions for the other interviews and surveys. It also will ensure that our later data collection addresses any issues or concerns of interest to ENO and TPA staff. Finally, it will allow us to clarify any questions regarding our proposed sampling plans.

Market actor interviews and customer surveys will follow the ENO and TPA staff IDIs. We will begin preparing guides for these interviews and surveys, as well as the sample plans, after completing the first staff interviews, but we will complete them only after completing the second round of staff interviews to ensure that they are complete and accurate.

We will check in with ENO and/or TPA contacts toward the end of each program year to assess progress and identify any issues that arose during that year that should be addressed in the report.

The Evaluator will submit all data collection materials, sample plans, and other contact materials (e.g., mail or email recruitment scripts) to ENO for review before beginning evaluation activities. We will establish the review protocol with ENO during project initiation. Our goal is to establish the approach that makes the most sense for ENO staff – whether to provide all instruments and sample plans in a bundle or to establish a schedule that prioritizes certain instruments and plans for submittal. The latter may reduce the burden on ENO staff and allow for a more efficient review process. We will address all comments and revise instruments as needed.

3 ENERGY EFFICIENCY PROGRAM IMPACT METHODOLOGY

To provide ENO a clearer picture of how the Evaluator would approach EM&V of their programs we have included preliminary EM&V plan skeletons that would outline some of the specific tasks that would be undertaken, giving more specific context and using the approaches detailed in Section 2.1 and 2.3.

3.1 Home Performance with ENERGY STAR®

The Home Performance with ENERGY STAR® Program ("HPwES") is aligns with Department of Energy ("DOE") requirements and uses a whole-house approach. The HPwES provides free home assessments and incentives to program trade allies to install (1) low-cost measures such as LEDs and low flow devices and (2) comprehensive weatherization services. The program provides walkthrough assessments with simple direct

Review implementer's software, compared to national programs (Energy Gauge, Treat, Energy Pro, etc.) → Stratify program into electric heated and non-electric heated homes → Request billing data for program homes → Compare program savings estimates to billed use → Conduct surveys with statisticaly valid sample of customers analyzed → Conduct on-site inspections for subsample of survey respondents

install as well as more detailed assessments with diagnostic testing.

Figure 3-1 summarizes the steps taken in the impact evaluation.

Figure 3-1: HPwES Impact Evaluation Steps

3.1.1 EVALUATION STUDIES

The goal of the impact evaluation is to address and minimize areas of uncertainty in the savings estimates. The Evaluator has addressed most of the measures in HPwES with primary research, though not all have been completed. Figure 3-2 summarizes the relative magnitude of ex ante savings estimates by measure for HPwES as of November 2021, as well as each measure's current disposition in the NO TRM (results based on primary data collected in evaluation, based on simulation modeling using New Orleans codes and weather, or based on citation of another study).
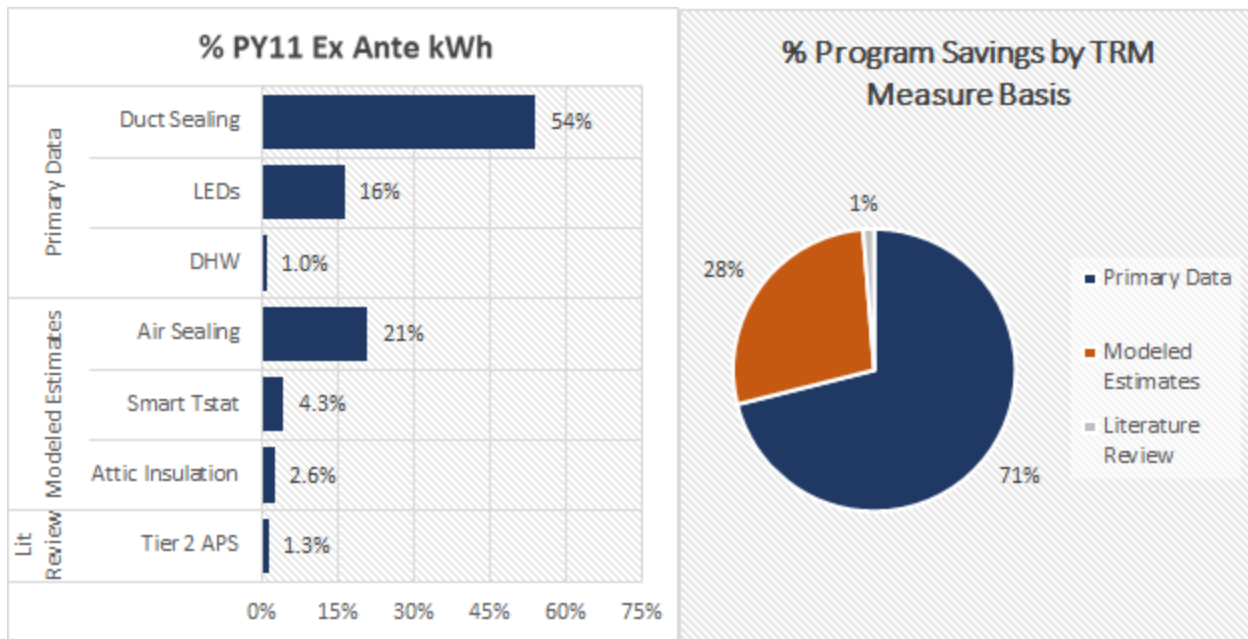
Figure 3-2: HPwES Measure Impact & Savings Dispositions

Seventy-one percent of PY11 ex ante savings estimates have a basis in primary research data – ADM conducted metering studies for HVAC heating and cooling hours, residential lighting hours of use, and DHW setpoints which have informed these measure categories. From this, ADM concludes that the greatest remaining uncertainty to address are in impacts from air sealing, smart thermostats, and attic insulation. These measures will be addressed as follows:

- **Air Sealing / Insulation:** ADM will evaluate impacts based on billing data analysis for homes that receive just one of the three "major measures" (ceiling insulation, duct sealing, air sealing). This analysis will use participant data from multiple program years to ensure sufficient data amount and quality for the study.
- **Smart Thermostats:** evaluated separately as they are a larger measure in other programs (RL&A, BYOT). Results from these programs will be applied to smart thermostats within HPwES.

3.1.2 PROCESS EVALUATION
In addition to the general process evaluation questions, the Evaluator will address the following:

- **Branding research:** ADM will address the relative importance placed by participants on the two branding mechanisms used for this program: ENERGY STAR versus Energy Smart.
- **Evaluation of implementer's software:** ADM will evaluate the contractor's software tool for accuracy in characterizing the participant's home, user-friendliness for trade allies, and identify areas of potential user-error.
- **Development of trade ally KPIs:** ADM will work with ENO and the TPA to develop an annual list of trade ally key performance indicators (KPIs). This may include:
    - o　Audit-to-install conversion rates
    - o　Measures per home
    - o　kWh savings per home
    - o　Geographic coverage
    - o　Staffing level

3.1.3 NON-ENERGY IMPACTS

To-date, the Evaluator has completed the following NEI studies:

- Reduced arrears/disconnects resulting from weatherization
- Avoided replacement cost associated with LEDs

NEI studies the Evaluator would consider for this upcoming program cycle include:

- Health & safety benefits associated with improved indoor air quality
- Health and safety benefits associated with better home sealing during extreme heat/cold

3.1.4 EVALUATION SUMMARY

Table 3-1 summarizes the evaluation activities to be completed for HPwES.

Table 3-1: HPwES Program EM&V Activities & Sample Sizes

Activity	Sample	Impact	Process	Research Goals
Database Review	Census	·	✓	Identify the proportion of online assessment participants that participate in other programs.
Software Platform testing	-	✓	✓	Validate accuracy of implementer's software platform compared to others used in the industry. Identify potential usability barriers for trade allies.
On-site inspection	70	✓		Verify installation & retention of measures. Diagnostic testing to verify building performance after duct/air sealing.
Participant Survey	70	·✓	✓	Investigating sources of awareness, participation experiences, satisfaction, and success funneling customers to other programs. Collection of Net-to-Gross parameters
Trade Ally Interviews	8		✓	Address trade ally participation, outreach methods and level of engagement with the program. Evaluate effectiveness of ENO/TPA support.

3.2 AC Solutions

The AC Solutions Program provides financial incentives to encourage residential customers to improve the efficiency of their HVAC systems. Incentives are provided through this program for a tune-up of the system, a replacement of HVAC systems, duct sealing, and smart thermostats.

The Evaluator proposes to include desk reviews and site visits in the AC Solutions impact activities for to confirm details of the equipment and installation guidelines are met and that the savings values are applied appropriately. The Evaluator proposes to use the methods and inputs presented in the New Orleans TRM to evaluate the energy impacts of each measure offered under the AC Solutions Program.

The following New Orleans TRM sections will be used to evaluate savings from the program:

- Central air conditioner and heat pump replacements: C.3.1 and C.3.4
- Heat pump tune-ups: C.3.7
- Ductless heat pumps: C.3.6

> ▪ Duct sealing: C.3.8

These calculations will incorporate results from document reviews and on-site testing where appropriate. These activities will also help identify program recommendations, such as improving data tracking standards or updating the application of measure savings. To estimate net savings for each measure, The Evaluator will estimate free ridership ratios with participant survey responses.

3.2.1 EVALUATION STUDIES

Figure 3-3 summarizes the savings by measure and the rigor level of the deemed savings basis for measures in PY11 A/C Solutions.
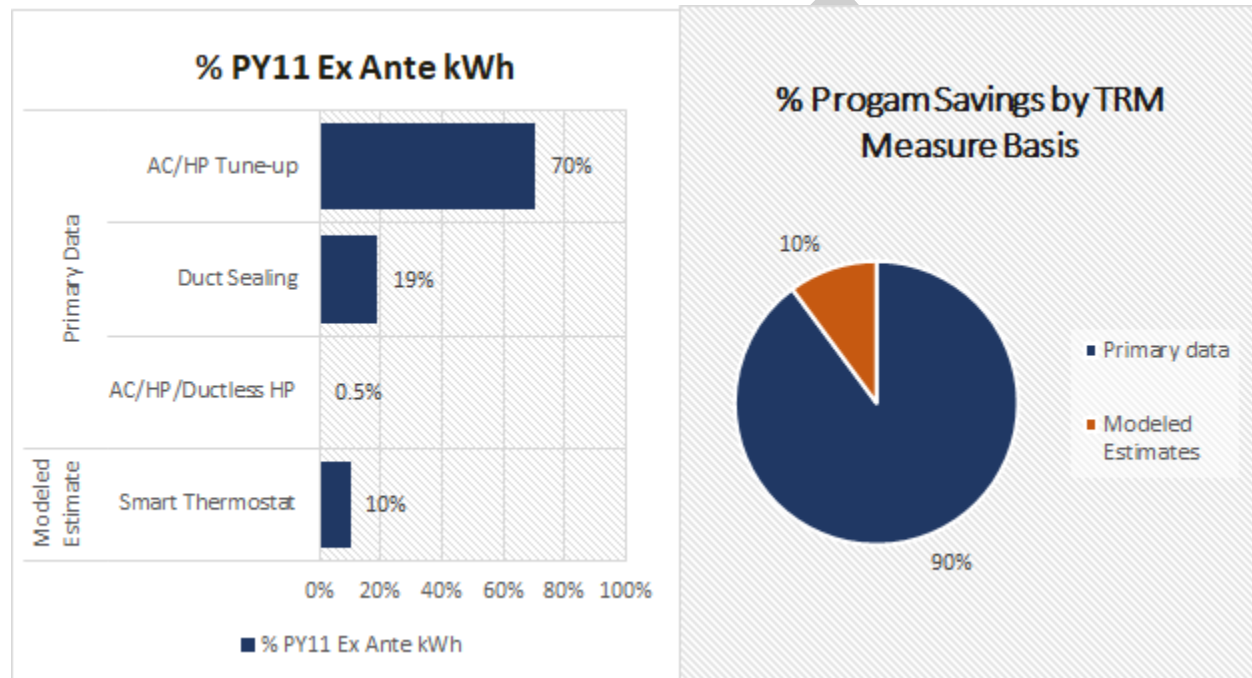
Figure 3-3: A/C Solutions Measure Impact & Savings Dispositions

The Evaluator has conducted significant measure research for most measures in this program – the remaining component requiring study is smart thermostats. The Evaluator will conduct a billing analysis for smart thermostats to develop savings estimates for the following categories:

- ▪ Single vs. multifamily
- ▪ Central A/C
- ▪ Heat pump heating, electric resistance heating, and gas furnace

3.2.2 EFLH ANALYSIS UNDER COVID CONDITIONS

EFLH estimates were based on pre-covid home occupancy patterns. The Evaluator recommends reevaluating EFLH to address the increased occupancy rate due to work-from-home (WFH) induced by COVID. In all residential surveys, the Evaluator will ask the following battery question:

Since the onset of the COVID-19 pandemic, many households in New Orleans have had more people at home during the day due to working from home, school closures, or other reasons. Compared to before the pandemic, would you say your household has:

- ▪ More time at home, due to working from home or school closures; or
- ▪ No change in time spent at home.

The answer from this question will be used as an input variable in a regression of customer AMI data, which will be used to determine if the home has increased EFLH due to the pandemic. This value will then be applied to an update to EFLH based on the relative weight of respondents that note increased hours at home.

3.2.3　PROCESS EVALUATION

In addition to the general process evaluation questions, The Evaluator will address the following in evaluating AC Solutions:

- ▪ **Cross-promotion of ENO DR programs:** The Evaluator will address the extent of DR program marketing to A/C Solutions participants and identify means to improve this cross-promotion.
- ▪ **Comfort/air quality:** The Evaluator will address the extent to which customers note improved air quality and comfort as part of data collection for potential non-energy impacts.

3.2.4　EVALUATION SUMMARY

Table 3-2 summarizes the evaluation activities to be completed for AC Solutions.

Table 3-2: AC Solutions Program EM&V Activities & Sample Sizes

Activity	Sample	Gross	Net	Process	Research Goals
Staff Interviews	2			✓	Understanding the program implementation processes, reviewing marketing materials and messaging, and reviewing project flow.
Database & Engineering Review	Census	✓			Validation that savings calculated by the TPA and verify inputs to savings calculations.
Participant Surveys	440	✓	✓	✓	Estimate in-service rates for rebated equipment, characterize equipment usage, estimate free ridership ratios, assess satisfaction with the utility and program, explore key influencers of improvement projects. Sample designed to meet 90/10 by HVAC replacement, HVAC tune-up, and smart thermostat participants.
Trade Ally Interviews	8			✓	Address trade ally participation, outreach methods and level of engagement with the program. Evaluate effectiveness of ENO/TPA support.

The Evaluator will work with Entergy to update the staff interview, participant survey, and trade ally interview sampling plans with participation relevant to the evaluation period.

3.3 Retail Lighting & Appliances

The Retail Lighting & Appliances Program (RLA) is an upstream program in which Entergy provides incentives directly to participating retailers to reduce the purchase price of ENERGY STAR-rated LED lighting products at participating retail locations. The TPA works with to implement the program is responsible for negotiating

product prices, managing retailer enrollment, providing support and training, designing, and implementing marketing campaigns, and managing data tracking. Additionally, the RLA Program provides downstream incentives for mail-in rebates for refrigerators, window ACs, poop pumps, smart thermostats, and heat pump water heaters.

Additionally, Entergy started offering the Energy Smart Online Marketplace in late 2019, an online sales platform that provides discounts on energy conservation products. This online platform was shown to be one of the primary drivers of participation during COVID-19 Stay-At-Home Orders in the second quarter of 2020. It had enabled customers to continue participating in the RLA Program virtually instead of in-person. The Online Marketplace offers smart thermostats, LED light bulbs, advanced power strips, low flow showerheads and aerators, as well as hot water pipe insulation. ADM proposes to continue assessing participation through the Online Marketplace to provide insights that would allow the RLA Program to increase energy savings potential offered through the program.

ADM proposes to use the New Orleans TRM 5.0 to evaluate each measure offered under the RLA Program. The calculation methodologies to be performed will follow the methodologies described in the New Orleans TRM. The following New Orleans TRM sections will be used to evaluate each of the offered measures through the program:

- Heat Pump Water Heater: Section C.2.1.5
- LEDs: Sections C.5.2 and C.5.3
- ENERGY STAR Pool Pumps: C.1.9
- ENERGY STAR Refrigerators: C.1.10
- Smart Thermostats: C.3.9
- Window Air Conditioners: C.3.2
- Aerators: C.2.4
- Showerheads: C.2.5
- Dehumidifiers: C.1.8
- Pipe Wrap: C.2.3
- Power Strips: C.1.7

In addition, free ridership ratios will be calculated for the following RLA measure offerings with participant survey responses:

- ENERGY STAR refrigerator
- ENERGY STAR window air conditioner
- ENERGY STAR pool pumps
- Heat pump water heaters

To estimate net savings for the lighting measures, ADM will estimate NTG ratios and free ridership ratios for upstream bulbs using a price response model, wherein a regression is developed to estimate the relationship between price and quantity sold. The typical price elasticity model assumes that four broad factors affect bulb sales: prices, bulb models, promotional events, and seasonal trends. A separate model will be run for each bulb type (omni-directional LEDs and specialty LEDs).

3.3.1 EVALUATION STUDIES

As shown in Figure 3-4, 82% of RL&A savings are currently coming from LEDs, which have a well-supported savings estimate in the TRM based on a local metering study. Smart thermostats comprise 17% of program

savings, and this is slated to increase as LEDs are gradually phased out due to increasing baselines from the EISA backstop.
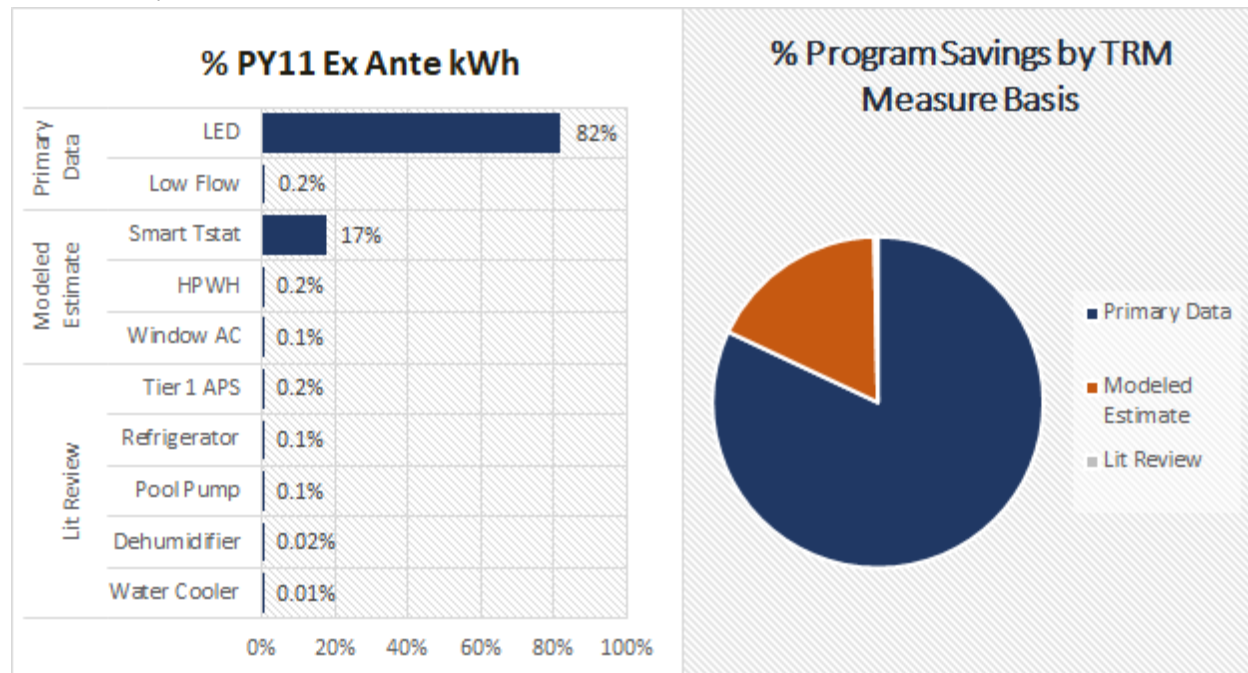
Figure 3-4: Retail Lighting & Appliances Measure Impact & Savings Dispositions

Based on this, the Evaluator will complete a smart thermostat measure study that cuts across all programs that offer the measure (RL&A, AC Solutions, HPwES, etc.). ADM will observe the contribution of other measures in response to reduction in funding for LEDs before making any further measure study determinations; as of now, the measures in RL&A have low participation and savings totals and thus the expense of a detailed measure study is not justified.

3.3.1.1 Forecasting LED Cost-Effectiveness

A key researchable issue for the 2023–2025 plan is determining the potential impact of the EISA backstop provision on the program. Entergy will need to monitor the implementation of the provision to assess the ongoing cost-effectiveness of LED bulbs and, if needed, limit program-eligible bulb types and fixtures to those that continue to offer cost-effective energy savings.

3.3.2 PROCESS EVALUATION

In addition to the general process evaluation questions, ADM will address the following in evaluating RLA:

- **Benchmarking the transition plan away from lighting.** ADM will conduct a benchmarking study of other appliance programs to compare and contrast their planned & acted upon transition activities in light of the EISA backstop.

3.3.3 EVALUATION SUMMARY

Table 3-3 summarizes the evaluation activities to be completed for the Retail Lighting & Appliance Program.

Table 3-3: Retail Lighting & Appliance Program EM&V Activities & Sample Sizes

Activity	Sample	Gross	Net	Process	Research Goals
Retailer Interviews	10			✓	Understanding the program implementation processes and impact on lighting sales.
Database & Engineering Review	N/A	✓			Validation that savings calculated by the TPA and verify inputs to savings calculations.
Participant surveys	300	✓			Surveys with downstream measure participants. Verify measure installation and measure characterization
Participating Retailer Surveys	Attempt Census	✓		✓	Assess program impacts on the sale of ENERGY-STAR-rated LED products. Explore key influencers of consumer lighting purchases.
Price Modeling	Census		✓		Estimate price elasticity and revise NTGR for this program.

These activities will help identify program recommendations, such as improving program awareness, data tracking protocols, and cost-effectiveness of program measure offerings. ADM will work with Entergy to update the staff interview, participant survey, and trade ally interview sampling plans with participation relevant to the evaluation period.

3.4 Appliance Recycling & Replacement

The Appliance Recycling Pilot is designed to eliminate old, inefficient refrigerators and freezers from use, ensure their safe disposal, and prevent the equipment from being sold on a secondary market. The program offers customers a rebate of $50 for each qualified unit along with free pickup and recycling services to encourage participation.

Important changes in the program design since the last evaluation period include adding an online customer scheduling platform and discontinuing recycling of window and room air conditioners.

To accurately capture all program benefits, the program could incorporate non-energy impacts from avoided disposal costs that would otherwise face program free-riders (under the presumption that free-riders would otherwise have to arrange for the disposal of their unit rather than keep it in service). Data from the National Solid Waste Management Association can be used to estimate costs per ton for disposal, while the EPA's Waste Reduction Model (WARM) can be used to estimate impacts from recycling costs for plastics, glass, and insulating foam.

Table 3-4: Appliance Recycling Pilot Program EM&V Activities & Sample Sizes

Activity	Sample	Impact	Process	Research Goals
TPA Interview	1		✓	Understanding how the program is implemented and promoted to reach target markets. Delineating the roles and responsibilities of ENO and TPA staff.
Database & Engineering Review	N/A	✓	✓	Review tracking data against TPA's report to confirm data matches the report.
Survey of Participating Customers	30	✓	✓	Verifying participation; gather information to supplement the tracking data (e.g., location of the recycled unit, usage as a primary or secondary appliance, and part-use), collect data for NTG.
Statistical Analysis	Census	✓		Statistical analysis for ARP, if following NREL guidelines, would require pre-recycling metering, which is expensive and burdensome, requiring the customer to plug in their refrigerator again. We would recommend reviewing deemed vs. calculated savings under the Engineering Review as an alternative.
Disposal Costs Study	NA	✓		Analysis of refrigerator disposal costs. Inclusive of avoided landfill space, recycling costs, and incineration of insulating foam. Develops a quantifiable financial non-energy impact usable in cost-effectiveness testing. This approach aligns with a Non-Energy Impact study performed by Tetra Tech for the Massachusetts Program Administrators.[7]

As this is a Pilot, the evaluation will need to document lessons learned and provide advice on scalability. This Pilot is currently underway but has had implementation delays due to COVID – ADM anticipates that the Pilot will require further evaluation in the 2023-2025 cycle, but we acknowledge that this may not be the case and have thus included this approach for the purposes of a complete discussion of the Energy Smart portfolio.

3.5 Behavioral

The Behavioral Program is a program intended to reduce energy consumption across a group of households. The program sends select residential customers personalized reports and tips on saving energy based on each household's energy use. The program also offers a web portal to participants that allows customization of participants' home profiles and the creation of energy-saving goals. The objective of the program is to educate participants on smart energy use, enabling customers to reduce their energy use through straightforward actions.

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[7] http://ma-eeac.org/wordpress/wp-content/uploads/Special-and-Cross-Sector-Studies-Area-Residential-and-Low-Income-Non-Energy-Impacts-Evaluation-Final-Report.pdf

The Behavioral Program was first introduced to Entergy New Orleans' households in February 2017 as an opt-in pilot. In this experimental design, households could choose to opt-in to receiving the Energy Scorecards. In May 2017, the program converted to an opt-out program design in which a group of customers are randomly selected into a treatment or control group. The customers in the treatment group are selected to receive scorecards and the customers in the control group are selected to receive no program communication. Treatment group customers can opt-out from receiving materials (if they desire).

Since it's outset, the Behavioral Program had undergone several more program design changes in addition to implementor transitions. ADM understands that the Behavioral Program had been implemented with differing program experimental designs, which had brought about intricacies that require consideration in evaluation efforts. Nonetheless, the Behavioral Program is an integral part of Energy Smart's residential portfolio. Considering that the program currently provides educational materials to nearly 100,000 residential customers, the energy savings from Entergy's Behavioral Program has the potential to account for 70 percent of the residential portfolio energy (kWh) savings, or approximately 30,000,000 achievable kWh per program year.

To support the success of the program, ADM will work with Entergy and the Behavioral Program implementor to develop a valid program design that allows a rigorous evaluation plan for the program. ADM will follow IPMVP Option C, and the Residential Behavior Evaluation Protocol developed by the National Renewable Energy Laboratory (NREL)[8] to evaluate the program, following the while taking into consideration the details and complexities resulting from program design changes. ADM will continue to consult with the implementor on potential program cohort expansions, data requirements and recommendations for scorecard messaging, and potential cohort redesign to achieve full savings potential of a behavioral program, approximately 2-3% of annual household energy savings.

With the full integration of AMI meters in the ENO service territory, ADM proposes to use AMI data to enhance the estimation of kWh savings and the estimation of kW reductions through the program. The AMI meter data will be collapsed to an average daily value by month instead of using monthly billing data. Using this high interval data, estimates, errors, irregular meter reads, and corrections in monthly billing data will be avoided and higher precision will be achieved. ADM will instead use the instantaneously collected AMI consumption data to summarize accurate estimates for each customer for each month.

The Evaluator will use this AMI meter data to isolate ENO's peak demand window to model demand reductions because of behavioral changes through the program. Using observed interval data rather than a regional estimated loadshape allows more accurate estimation of demand reductions and informative conclusions to improve the program.

For the impact evaluation of the Behavioral Program, the Evaluators will explore a fixed effects Difference-in-Difference regression model as well as a post-Program regression model to evaluate verified savings. We will estimate energy consumption for members of the treatment group before and after program intervention. Similarly, we will estimate energy use for members of the control group during the same periods as the treatment group. Using this approach allows for statistical comparison to measure the effect of the program's interventions and messaging, estimating the difference in energy use among customers that received educational materials and tips against those that did not receive any materials.

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[8] https://www.nrel.gov/docs/fy21osti/77435.pdf

After consulting with Entergy and the implementer, the Evaluator will design an appropriate evaluation plan that incorporates stratification of cohorts based on delivery mechanism and experimental design. This may entail stratification by communication method (mail vs. email), frequency of communication (monthly vs. quarterly), amount of time since intervention, messaging strategies,[9] and any other important delineations. The Evaluator will also consider each household's previous participation in the program to delineate cohorts appropriately.

For cohorts in which a randomized control trial (RCT) experimental design is established, as recommended by NREL's Residential Behavior Evaluation Protocol, the Evaluator will verify the cohorts remain statistically valid before conducting linear regressions. For cohorts in which an RCT experimental design is not established, the Evaluator will design a quasi-experimental counterfactual group similar to the treatment group via propensity score matching. 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 and reduce bias in the resulting regression analysis. The valid counterfactual group will enable the Evaluator to estimate actual consumption effects due to program participation, netting out any changes in consumption due to macroeconomic changes such as COVID-19 impacts, changes in the economy, or implications due to large weather systems. These quasi-experimental control group will also undergo equivalency testing to ensure the groups are void of any statistically significant differences in energy consumption behaviors compared to the associated treatment group. The treatment and control group will be tested for statistically significant differences in usage between each group for each of the 12 pre-period months.

We will work with Entergy to avoid double-counting energy savings by comparing members of the treatment and control groups against program tracking data for the remainder of Entergy's portfolio, quantifying double-counted savings on a per-participant basis.

3.5.1 EVALUATION STUDIES

3.5.1.1 Attrition Analysis
The Evaluator will conduct an attrition analysis using the information requested to evaluate this program. The tracking of treatment and control households can be affected by either move-outs or opt-outs (known collectively as 'attrition'). If a household's final bill was the end of the evaluated post-period, it will be considered a move out and bills occurring after moveout will be removed from the analysis. The Evaluator will report the cumulative level of both treatment and control move outs over the program life by monthly period, cohort, and treatment/control status for each program year. This information can be useful to Entergy for the potential need for future wave expansions for the Behavioral Program.

3.5.1.2 Frequency and Delivery Mechanism Analysis
The Evaluator proposes to address the extent to which energy savings is shown to increase due to messaging frequency or delivery mechanism. The Evaluator will conduct a billing analysis to identify and compare observed consumption differences for the following categories:

- Monthly scorecard reports
- Quarterly scorecard reports

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[9] For example, if some treatment households receive scorecards comparing their current energy use to their household's energy use during the previous year, while others receive a comparison against neighbors' energy use, the effect of messaging should be tested in separate analysis groups.

- ▪ Mailed scorecard reports
- ▪ Emailed scorecard reports

The Evaluator will compare the cost-effectiveness of each method to denominate acquisition cost.

3.5.1.3 Energy Savings Correlated to Day of Week and Hour of Day

The Evaluator will also explore whether certain days of the week, or certain times of the day contribute to higher savings. For example, AMI interval data allows the Evaluator to isolate the peak or always-on load reductions for each household. In the case that the Evaluator can characterize a portion of time that correlates with higher savings, the Evaluator can work with the implementor to make use of this information to provide updates to messaging techniques.

3.5.2 EVALUATION SUMMARY

Table 3-5 summarizes the evaluation activities to be completed for the Behavioral Program.

Table 3-5: Behavioral Program EM&V Activities & Sample Sizes

Activity	Sample	Impact	Process	Research Goals
TPA Interviews	2	✓	✓	Understanding the stratification and selection process for selecting treatment and control groups.
Treatment & Control Group Review	N/A	✓	✓	Conduct equivalency testing to review the validity of treatment and control groups to ensure comparisons and savings estimates are unbiased.
Statistical Analysis of Energy Savings	Census	✓		Compare energy use among treatment and control groups to determine whether statistically significant reductions occurred among the treatment group.
Double Count Analysis	Census	✓		Tabulate other-program-savings from treatment and control group customers to calculate the excess kWh per customer found in the treatment group. Net this effect out to prevent double counting.
Participant Survey	140		✓	Verify participation. Address customer satisfaction and program awareness. Assess usage of the web portal.
Program Drop-out Surveys	Up to 40	✓	✓	Survey drop-outs (customers who previously received HERs but opted-out of future HERs). Identify causes of drop-out.

These activities will help identify program recommendations, such as improving program awareness, data tracking protocols, and cost-effectiveness of program measure offerings. The Evaluator will work with ENO to update the staff interview, participant survey, and trade ally interview sampling plans with participation relevant to the evaluation period.

These activities will help identify program recommendations, such as improving program awareness, data tracking protocols, Rewards portal offerings, and customer satisfaction. The Evaluator will work with Entergy to update the staff interviews and participant survey sampling plans with participation relevant to the evaluation period.

3.6 Income Qualified Weatherization

The Income Qualified Weatherization (IQW) offering targets and offers comprehensive weatherization services to qualified low-income, single-family homes and low-rise, multi-family dwellings of four or fewer units. The IQW 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 IQW offering provides customers with household incomes of 200% 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 contractor. Contractors collect information to vet customers' income qualification through a series of questions.

The impact evaluation approach is the same as described for HPwES in Section 3.1.

Table 3-6: IQW Program EM&V Activities & Sample Sizes

Activity	Sample	Impact	Process	Research Goals
Staff Interviews	5		✓	Understanding the outreach and QC process. Assessing program operations and recommendations for improvements. Understanding barriers faced when conducting in-home assessments.
Participant Survey	70		✓	Investigating sources of awareness, participation experiences, and program satisfaction.

3.6.1 EVALUATION STUDIES

The Evaluator has completed an arrearage & disconnect impact study for IQW and has monetized these as program NEIs. The Evaluator proposes to conduct addition low-income customer impact research, including:

- Property value increases
- Reduced moving/relocation
- Reduced water/sewage/detergent use
- Avoided appliance repair costs

3.7 Multifamily Solutions

The Multifamily Solutions Program (MSP) targets multifamily property owners and landlords with direct-install measures and rebates for prescriptive measures. The program addresses the split incentive issue where the property and bill responsibility are not held by the same party. Common area retrofits that do not directly impact tenant bills would be completed through ENO commercial program offerings.

The program is modest in size, and thus impact evaluation activities would be limited. The general approach would align with that detailed for HPwES in Section 3.1. The primary goals of the process evaluation will be to solicit feedback from tenants, managers, and assessors to address the extent to which the program is meeting the perceived needs of its intended participants.

Table 3-7: Multifamily Solutions Program EM&V Activities & Sample Sizes

Activity	Sample	Impact	Process	Research Goals
Assessor Interviews	4		✓	Understanding of the customer recruitment and assessment process. Identification of gaps or missed opportunities in assessments.
Apartment Manager Interviews	4		✓	Understanding of the participation process. Evaluate the effects of program participation on building operations. Identify potential future opportunities for reengagement.
Tenant Surveys	40	✓	✓	Verify participation. Identify if equipment has been removed. Assess participant satisfaction. Evaluate impact of program on home comfort and customer bills.

3.8 NOLA Wise School Kits and Outreach Program

The NOLA Wise School Kits and Outreach Program (SK&O) program provides energy and non-energy benefits to school teachers, students, and their households. The hands-on program aims to increase student knowledge and awareness of energy use and the adoption of energy-saving actions. Teachers receive program curriculum to educate students on energy concepts and the benefits of efficiency. Students receive a kit with energy-saving equipment.

Table 3-8: NOLA Wise School Kits & Education Program EM&V Activities & Sample Sizes

Activity	Sample	Impact	Process	Research Goals
TPA Interview	1		✓	Understanding outreach and QC processes. Delineating roles and responsibilities between ENO and TPA staff.
Review of Tabulated Data	N/A	✓		Validation of savings calculated by the TPA, verify inputs to savings calculations, and review installation rates.
Database & Review	N/A	✓	✓	Review tracking data against TPA's report to confirm data matches the report.
Participating Teachers survey	Up to 30		✓	Verify use of program materials and incorporation into the school curriculum. Address satisfaction and areas for improvement.

The activities we propose will help address common research areas for school kits programs, such as monitoring if program content meets state standards, examining changes in installation rates, and reviewing student survey questions to ensure questions are clear. If parent contact information is collected, we will consider a household survey to collect installation rates by kit measure.

3.9 C&I DSM Program General Methodology

Unlike residential programs, which usually have larger numbers of participants and can be expected to show a fair degree of homogeneity, programs for C&I customers usually have smaller numbers of participants and

some of the customers who do participate can be relatively large with unique operations, making it difficult to perform a census evaluation across participating customers. Stratified random samples and a site-specific M&V approach is therefore often more appropriate for C&I projects, with more reliance placed on using site-specific engineering analysis and end-use metering as methods to estimate savings. A site-specific M&V approach involves (1) selecting a representative sample of customers or sites that participated in a project; (2) determining the savings for each customer or site in the sample, usually by using IPMVP protocols; and (3) applying the results of estimating the savings for the sample to the entire population in the project.

We consider the number and complexity of the measures and technologies being promoted through a project as a factor in determining the savings estimation approach. For example, if multiple measures can be installed at a single customer site, there may be overlapping and/or interactive effects among the measures. Identifying the effects of individual measures therefore requires using a savings estimation approach that can account for the impact of interrelated measures.

As part of the first aspect of the evaluation of commercial programs we carefully review the analyses and calculations that were used to develop deemed or stipulated savings values for the measures that are rebated through the program. We evaluate the analysis for each measure according to the degree to which the savings calculations are supported and defensible and documentation is adequate. To facilitate our review of savings calculations, we use a checklist to record whether (1) the methodology used for the calculation was appropriate, (2) assumptions used were reasonable and appropriate, and (3) savings calculations were done correctly.

The accuracy of a savings estimate developed through engineering calculations depends on the extent to which the analysis is based on correct assumptions regarding such factors as usage patterns and operating hours. We assess assumed and actual baseline conditions by reviewing program baseline assumptions, verifying adequate supporting documentation, and testing the validity of those assumptions via interviews with participants and the findings from the verification effort. In our review of the calculation procedures used for different types of measures, we focus on the main factors that determine energy use.

- Normally, the weakest part of any engineering calculation of savings relates to the characterization of the operating schedules of energy using equipment. In reviewing the energy savings calculations, we determine whether the assumptions for usage patterns are within the range of reasonable hours for each building type and end-use application.
- For analyzing the calculations of energy savings and peak demand reductions associated with lighting measures, we focus on the three main factors that contribute to lighting energy use in a building: lighting capacity, the percentage of the capacity that is utilized, and hours of use. That is, while lighting retrofits primarily reduce power densities (i.e., watts per square foot), account needs to be taken of the utilization of that capacity.
- Similarly, there are factors whose effects on HVAC energy use are particularly important and that therefore are given special particular attention when we review the calculations for HVAC energy savings. Examples of such factors include thermostat set points and schedules, type of distribution system and control; ventilation rates, operating schedules for fans, lighting levels and schedules, particularly for office buildings, and equipment sizing.

Based on our evaluation of the calculations, we classify measures into one of three categories:

- Documentation is sufficient, and original savings estimate is reasonable.
- Documentation is sufficient, but original savings estimate is not reasonable.

- Both documentation and original savings estimate are inadequate.

If a measure falls into one of the last two categories, we provide references demonstrating deficiencies pertaining to the reasonableness of the given assumptions, the adequacy of the given documentation, and the appropriateness of the given methodology. Based on this work, we develop recommendations to ENO and program implementation staff regarding changes to stipulated savings values.

3.9.1 STRATIFIED SAMPLING

For the ENO Small Commercial Solutions, Large Commercial & Industrial Solutions, Publicly Funded Institutions and New Construction Solutions programs, Simple Random Sampling is not an effective sampling methodology as the CV values observed in commercial 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, we selected 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 carried out 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.

3.9.2 SITE VISITS

Project site visits are performed to collect data that will support calculations of savings impacts for commercial projects. We obtain the primary data needed to estimate electric impacts by making on-site visits to sampled sites.

 We use site visits to accomplish three major data verification activities:

- **First,** to verify the implementation status of all measures for which participants received incentives. To verify that the energy efficient measures were installed, that they were installed correctly, and that they function properly at the time of the project site visit.
- **Second,** the field personnel collect the physical data needed to analyze the energy savings that have been realized from the installed measures.
- **Third,** an interview was conducted with personnel at the residence/facility to obtain any additional information on the installed system to complement the data collected from other sources.

The focus of our site visit data collection is to obtain appropriate information to analyze the performance of the different types of energy systems at a facility. This includes collecting information on the quantity, sizing, servicing, and scheduling for HVAC, lighting, refrigeration, motors, process, and other equipment. We also collected information on the capabilities of building control systems (e.g., whether centralized or distributed, capabilities for monitoring, automation, or expansion). As part of the data collection, we conducted monitoring of specific measures, as is applicable and where it is feasible.

When projects are selected for inclusion in the Verification sample, the Evaluators provide program administrator staff with a list of projects for which the Evaluator will perform Verification activities. The list included the participant's name, the project ID, the site address, and the contact information of the participant representative the Evaluator contacted for Verification purposes.

At some non-prescriptive sites, monitoring is conducted to gather more information on the operating characteristics of the installed measures. Monitoring was conducted at sites for which the monitoring data is required for substantiation of calculation of ex post energy impacts. Monitoring is not considered necessary for sites for which other data allow for well-substantiated calculation of ex post energy impacts.

For purposes of this policy, "site visits" refers to employee visits to the Evaluator's clients or customers of the Evaluator's clients. The Evaluator only permits employees fully vaccinated against COVID-19 to perform site visits.

Staff performing site visits adhere to any applicable state and local governmental requirements applicable to the visit (e.g., wearing a face covering) as well as requirements of the client or client customer being visited.

Prior to any staff member being authorized to conduct site visits, the employee agreed to follow the Evaluator policy on COVID-19 and any revisions that may be communicated to staff.

Major methods for estimating gross energy savings and load shape impacts for commercial measures include engineering analysis, energy analysis computer simulations, end-use metering, and billing data analysis.

- **Deemed Savings** involves using stipulated savings for energy conservation measures for which savings values are well-known and documented. These prescriptive savings may also require an adjustment for certain measures, such as lighting measures in which site operating hours may differ from TRM values. ADM will work with ENO implementation staff to identify these instances and develop a method for calculated an adjusted value.
- **Partially/Fully Measured Retrofit Isolation** refers to any program where savings must be calculated on a per-site basis using primary data collected on-site or facility bills for a unique, premise-level analysis (as opposed to the large-scale, whole-program analysis detailed under the "Billing Data Analysis" bullet). This includes the Large C&I, Com NC and PFI programs for which custom protocols may need to be applied. This approach aligns with the IPMVP Option A and B.
- **Facility-Level Regression Analysis** involves estimating energy savings by applying a linear regression to a facility's pre-retrofit and post-retrofit interval meter data. This methodology includes defining a baseline for the facility, adjusting the baseline, and developing and refining a regression model to accurately predict energy consumption in the facility. The difference between projected energy consumption from the model and actual energy consumption equals the gross savings estimate. The methodology provided here references UMP Chapter 24 on Strategic Energy Management (SEM) Evaluation Protocol[10] and aligns with the IPMVP Option C.
- **Simulation Model Analysis** involves a whole building simulation using the program REM/Rate and a User Defined Reference Home (UDRH) to compare the efficient home and the baseline home. The UDRH is designed as an exact replica of each program participating home in terms of size, structure, and climate zone. This approach aligns with the IPMVP Option D.

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[10] https://www.nrel.gov/docs/fy17osti/68316.pdf

Our project team has extensive experience in using all these methods. Generally, the method used depends on the type of measure: lighting, HVAC, refrigeration, non-HVAC motors and VFDs, etc.

- **Savings from Process Improvement Measures.** Analysis of savings from process improvements, including changes to process equipment, is inherently project specific. Because of the specificity of such processes, analyzing the processes through simulations is generally not feasible. Rather, we rely on engineering analysis of the process affected by the improvements. Major factors in our engineering analysis of process savings are operating schedules and load factors. Information on these factors is developed through short-term monitoring of the affected equipment. Monitoring is done after the process change, and the data gathered on operating hours and load factors are used in engineering analysis to define "before" conditions for the analysis of savings.

- **Savings from Air Compressor Measures.** We analyze savings from air compressor system measures using the AirMaster+ tool (available from the U. S. Department of Energy's Industrial Technologies Program). We use the characteristics and monitor data collected on-site to develop the air flow and kWh load profiles that are the inputs to AirMaster+. These data will include not only electrical load measurements for compressors and auxiliary equipment (e.g., dryers, fans, etc.) but also inlet and discharge pressure measurements to calculate flows and pressure measurements for the compressor, dryer, and other critical components of the air compression system. If pre- and post-installation monitoring data are available, we draw a comparison to the results from AirMaster+ to make sure that they reasonably match.

- **Savings from Motors and VFDs.** Estimates of the energy savings from use of high efficiency motors or of VFDs are derived through an "after-only" analysis. With this method, energy use is measured for the high efficiency motor or VFD and after it has been installed. We (1) make one-time measurements of voltage, current, and power factor of the VFD/motor and (2) use ACR loggers to take conduct continuous measurements of amps over a period of time in order to obtain the data needed on operating schedules. The data thus collected are then used in estimating what energy use would have been for the motor application if the high efficiency motor or VFD had not been installed.

- **Savings from Refrigeration Measures.** Refrigeration measures are usually project-specific, and the methods used to evaluate savings may differ from case to case. In most cases, we perform the analysis using engineering principles aided by monitored data. Data on the efficiency of new equipment installed will be gathered from program records and verified with the manufacturers. Data on equipment runtime will be collected through short-term monitoring where applicable. We use these data to develop inputs for the eQuest energy analysis program (version 3.6.1b), which has the capability for simulating the energy use associated with various types of refrigeration. Simulations of eQuest with and without the refrigeration measure being analyzed are made to determine the amount of savings.

- **Savings from Custom Lighting Measures.** These measures typically involve a reduction in hours of operation and/or lower current passing through the fixtures. We analyze savings from lighting measures using data on (1) wattages before and after retrofit and (2) hours of operation. We take fixture wattages from a table of standard wattages, with corrections made for non-operating fixtures. We collect data to determine average operating hours for retrofitted fixtures by using Time-of-Use (TOU) data loggers to monitor a sample of "last points of control" for unique usage areas in sites where lighting efficiency measures have been installed.

- **Savings from HVAC Measures.** For the analysis of HVAC measures, we develop estimates of the savings through simulations with our energy analysis models (e.g., CPA-123, DOE-2, eQuest). The HVAC simulations allow us to assess the primary and secondary effects of lighting measures on energy use. Each simulation produces estimates of HVAC energy and demand usage to be expected under different

assumptions about equipment and/or construction conditions. For the analysis of HVAC measures, we draw on the data collected through on-site visits and monitoring.

3.9.3 QA/QC

The Evaluator would work with program implementers to develop and implement appropriate quality assurance/quality control (QA/QC), inspection and due diligence procedures for each program. This will include reviewing and, if appropriate, modifying, QA/QC and M&V processes that will be developed by the implementers for each program. The procedures will vary by program and are necessary to assure customer eligibility, completion of installations, and the reasonableness and accuracy of savings upon which incentives are based.

We have considerable experience in working with utility and implementation contractor personnel to ensure that energy efficiency projects are acceptable and conforming with program requirements. The technical approach and work plan for providing QA/QC services that we describe in the following discussion is based on our extensive experience with similar work efforts and provides a direct and practical method for accomplishing the main goals for the QA/QC work.

To guide the QA/QC work, we develop QA/QC standards customized for each program and / or for plan-level QA/QC. The standards cover details of program processes, including business processes and related controls, specific customer and contractor feedback mechanisms for each program, program roles and responsibilities, reporting requirements, and correction protocols for deficient performance.

Although the standards, in concept, should be the same, the type of data and the level of information that are required will differ by program type. The standards will specify site and customer information, tracking data specifications for before- and after-measure implementation including rating, efficiency, size, and other measure or program attributes.

ADM understands that quality assurance is an essential part of any worthwhile operation and is committed to ensuring that the best QA/QC procedures are used to ensure that there are no compliance issues with regulators and no problems with future audits of ENO's programs. Our staff are well-trained in the QA/QC procedures that will be used for this work, having used such procedures on a number of projects. However, training specific to the requirements of this QA/QC effort will be provided to all project staff to ensure consistency of methods.
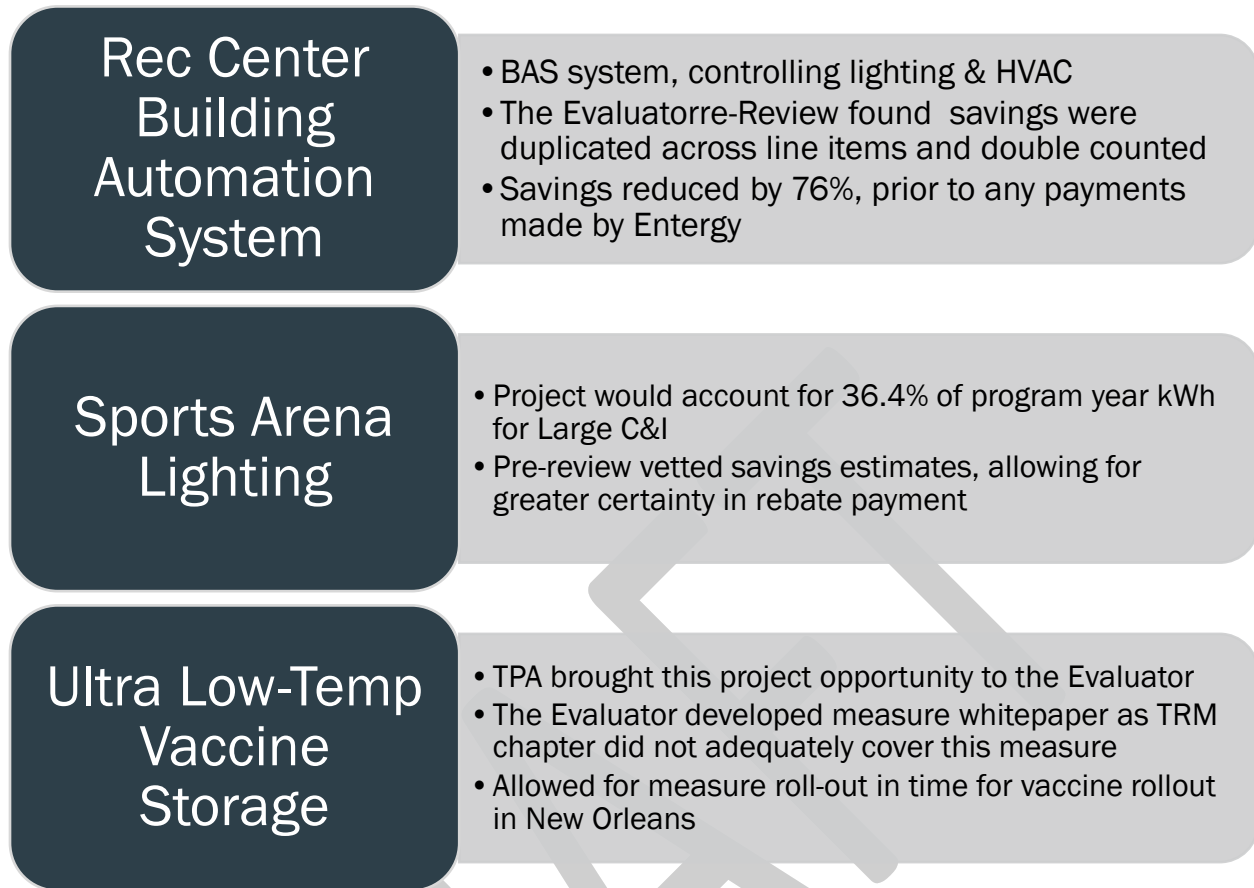
Rec Center Building Automation System
- BAS system, controlling lighting & HVAC
- The Evaluatorre-Review found savings were duplicated across line items and double counted
- Savings reduced by 76%, prior to any payments made by Entergy

Sports Arena Lighting
- Project would account for 36.4% of program year kWh for Large C&I
- Pre-review vetted savings estimates, allowing for greater certainty in rebate payment

Ultra Low-Temp Vaccine Storage
- TPA brought this project opportunity to the Evaluator
- The Evaluator developed measure whitepaper as TRM chapter did not adequately cover this measure
- Allowed for measure roll-out in time for vaccine rollout in New Orleans

Figure 3-5: Real-time M&V Examples from Energy Smart Large C&I

3.9.4 NET-TO-GROSS (NTG)

The net savings attributable to the commercial programs may differ from gross savings due to free-ridership and spillover. Free ridership decreases net program impacts whereas spillover increases net program impacts. Spillover includes several effects. First, participants may be influenced by the program to invest in energy-efficient measures not included in the program. Second, non-participants may adopt measures promoted by the program as a direct result of the program but do so outside of the program. One impact of spillover is the additional energy savings that result because non-participants purchase greater efficiency then they otherwise would have, due to differences in Trade Ally actions available at the time of purchase. There may also be additional energy savings from non-participants due to program marketing impact on awareness of energy efficiency. The goal of the net savings analysis is to infer the magnitude of free-ridership and spillover effects and to determine the net savings impact of a program. NTGRs are applied to the adjusted or verified gross savings to estimate net program savings.

The Evaluator expects to use self-reported survey data to evaluate free ridership, spillover, and overall net savings for most programs. Participant surveys for the Site-Specific Program will include a subsection of questions designed to measure both free-ridership and spillover. Survey free-ridership questions are followed by questions designed to measure spillover, referring to where a customer installed equipment through the program in the past year and then installed additional equipment due to program influences without the help of a rebate.

Resulting survey data will be used the develop NTGRs used to adjust verified program-level gross savings to verified net savings. Survey efforts will be such that we will attempt to reach 90/10 precision for NTG estimates.

3.10 Small Business Solutions Program

Small Business Solutions Program (SBS) 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.

Lighting accounts for 100% of the PY11 SBS expected savings, though all program measure offerings a have measure chapters in the ENO TRM 5.0. The prescriptive algorithms and methodologies (including eligibility), from the New Orleans TRM will be used to calculate to determine verified gross energy impacts. The evaluated results will include impacts from findings during data collection such as equipment operation schedule and in-service rate.

These calculations will incorporate results from document reviews and on-site testing where appropriate. These activities will also help identify program recommendations, such as improving data tracking standards or updating the application of measure savings. To estimate net savings for each measure, The Evaluator will estimate free ridership ratios with participant survey responses.

Key impact evaluation objectives include:

- Review the retrofit program tracking database for measure type and size distribution
- Create a comprehensive sample of projects with sub-strata to achieve a 90/10.
- Verify installation and operation conditions of equipment with an in-person visit, remote visit, or other forms of communication.
- All ADM employees doing field work are fully vaccinated against COVID-19 and will follow all regulations required at each individual job site.
- Analyze all sampled sites using the provided ex-ante savings documentation and all collected data/information from the site verification process to provide an e-post savings estimate.
- Report findings and observations regarding the ex-post savings values calculated and provide recommendations to improve the effectiveness of future retrofit programs.

3.10.1 COMMERCIAL ENERGY SAVINGS KITS

Commercial Energy Saving Kits were introduced as an additional program channel in PY10. The channel was designed to target three different small business segments, restaurant, office, and retail. Small businesses are the least likely of ENO's customers to participate in energy efficiency programs. The channel provides a kit developed specifically for each small business segment along with educational material to improve life-long energy saving behavior and increase the likelihood of future participation in ENO energy efficiency programs.

Key impact evaluation objectives include:

- Review of program tracking data to determine and verify energy savings, demand reduction, and water savings attributable to the program.

- Create comprehensive sample of projects with stratum based on small business segments to achieve 80/20 confidence and precision for each stratum, and conduct email and telephone verification surveys to determine measure installation rates.
- Provide energy and non-energy impact estimates and ex-post realization rates attributed to each component of commercial Saving Kits program (Restaurant, Office, and retail).
- Report findings and observations regarding calculated ex-post savings and provide recommendations to improve accuracy and transparency of future reporting of the Commercial Saving Kits program.

Key research topics for SBS include:

- Determining Cross-Sector Impacts Most of the savings from this program are from measures that are viable for residential installation (LEDs, aerators). The customer survey will address the extent to which the respondent installed any such measures in their home versus their business. ADM will then estimate savings based on ENO residential deemed savings parameters. We are not certain if cross-sector savings may be claimed within a program – this program is funded by a non-residential tariff and thus savings in the residential sector may not be claimable. If they are claimable, they will be incorporated into the verified savings estimate. If they are not claimable, they will be noted in the report but not incorporated into verified impact estimates.

3.10.2 PROCESS EVALUATION

Activities completed as part of process evaluation will include:

- Document review (program materials, applications, and marketing materials).
- Review of program tracking data.
- Program staff interviews;
- Up to 15 trade ally interviews; and
- Participant surveys (n=70)

The Evaluator will synthesize the process findings into a report section organized by program. As applicable, we will provide recommendations for program improvement.

Key issues for the process evaluation of the SBS program include:

- What are participant motivations for completing the incentivized retrofits?
- What is driving awareness of the program and is awareness of the incentive occurring early in the project planning process? Are the program marketing and outreach processes effective?
- Are participants aware of ENO educational efforts such as energy-saving tips posted on social media and technical training offerings?
- Are there opportunities to improve the application review and submission process or the support provided participants?
- Are participants aware of the program incentives offered for other types of retrofits and have they considered them?
- Is the tracking system and process effective for supporting and documenting installed measures, tracking savings estimates, and to research past participation?
- Do quality control procedures effectively balance risk mitigation and efficiency?
- Are rebates processed in a timely manner?
- Do measures overlap with the custom incentive program? How are measures routed to the prescriptive program or the custom program?

- Are participants and contractors happy with the program or are there areas of improvement needed? How do their views benchmark with general customer findings from the Burke Customer Relationship Survey on how well ENO is meeting customer efficiency needs?

Key researchable issues for the process evaluation of the **energy saving kits component** include:

- What do the ENO survey data tell us about participants experience with the kit program?
- Are the kits leveraged to promote the incentive programs and to the kits drive participation in the programs? Is program participation after receiving a kit a metric that ENO tracks?
- Are kits appropriately tailored to the market segment? Are there measures that should be considered for incorporation?
- Are there market segments with sufficient size and program interest that would warrant a new kit design?
- Is the tracking system and process effective for supporting and documenting kit distributions and to research past participation?
- Are the kit measures installed and if not, why not? Are participants satisfied with the measures?
- What is the total "lost opportunity" by project?

The Evaluator will synthesize the process findings into a report section organized by program. As applicable, we will provide recommendations for program improvement.

Table 3-9: Small Business Energy Solutions Program EM&V Activities & Sample Sizes

Activity	Sample	Impact	Process	Research Goals
ENO Staff Interviews	2		✓	Understanding of program history, processes, lessons learned, and effect of past evaluation recommendations.
TPA Interviews	2-4		✓	Understanding outreach and QA processes. Delineate roles & responsibilities between ENO and implementation staff.
Deemed Savings Review	N/A	✓		Validation that savings assumptions apply TRM or other appropriate citations/calculations.
Tracking Data Review	N/A	✓	✓	Checking tracking data for systematic errors in customer information, project information, or savings calculation.
Project M&V	36	✓		Gross impact evaluation can include documentation and calculation review, participant surveys, on-site verification, metering, along with sampling and reporting.
Participant Survey	Lighting:40 Non-Lighting: 20 Kits: 100	✓	✓	Verifying participation. Address customer satisfaction. Identify areas for program improvement. Conduct NTG data collection.
Trade ally Interviews	Lighting: 8 Non-Lighting: 2	✓	✓	Understand experiences of Trade allies in the program. Identify how role of Trade allies algins with program theory. Collect data to support Trade ally based NTG estimate.
Program Drop-out Surveys	40 participants, 10 Trade allies.	✓	✓	Survey customers that receive an audit but do not complete a project, Trade Allies that receive training but do not complete projects. Identify causes of drop-out and potential spillover.

3.11 Large Custom and Industrial Solutions

Large Commercial & Industrial Solutions (Large C&I) provides financial incentives and technical services to engage non-residential customers with greater than 100 kW connected load and is designed to help this segment overcome barriers to energy improvement. Rebates are available include:

- Prescriptive (TRM-based)
- Custom Lighting
- Custom Non-Lighting
- Retro-commissioning

All prescriptive measure offerings in the Large C&I program have measure chapters in the New Orleans TRM 5. For custom or otherwise non-prescriptive measures, ADM will determine which IPMVP Option, A, B, C or D will be best suited to the project and develop an M&V plan accordingly.

Key impact evaluation objectives include:

- Review the retrofit program tracking database for measure type and size distribution
- Create a comprehensive sample of projects with sub-strata to achieve a 90/10.
- Verify installation and operation conditions of equipment with an in-person visit, remote visit, or other forms of communication.
- Analyze all sampled sites using the provided ex-ante savings documentation and all collected data/information from the site verification process to provide an e-post savings estimate.
- Report findings and observations regarding the ex-post savings values calculated and provide recommendations to improve the effectiveness of future retrofit programs.

3.11.1 PROCESS EVALUATION

Activities completed as part of process evaluation will include:

- Document review (program materials, applications, and marketing materials);
- Review of program tracking data;
- Program staff interviews;
- Up to 15 trade ally interviews; and
- Participant surveys (n=35).

Table 3-10: Large Commercial and Industrial Solutions Program EM&V Activities & Sample Sizes

Activity	Sample	Gross	Process	Research Goals
ENO Staff Interviews	2		✓	Understanding of program history, program processes, lessons learned, and incorporation of past evaluation recommendations.
TPA Interviews	2-4		✓	Understanding outreach and QA processes. Delineating roles and responsibilities between ENO and TPA. Identify implementation challenges.
Tracking Data Review	N/A	✓	✓	Checking tracking data for systematic errors in customer or project information and impacts.
Project M&V	35	✓		Gross impact evaluation can include documentation and calculation review, participant surveys, on-site verification, metering, along with sampling and reporting.
Participant Survey	35	✓	✓	Address customer satisfaction. Identify areas for program improvement. Conduct NTG data collection.
Trade Ally Interviews	15		✓	Understand experiences of trade allies in the program. Identify how trade allies' role algins with program theory.
Case Studies	As many as needed	✓	✓	As needed, evaluate, and discuss both "problem projects" and "success stories" that can serve as general, relevant studies. For example, were there any projects with extremely low realization rates, full free-ridership, or failure to complete in the six-month timeframe? Likewise, were there any projects that were at risk, but were salvaged? How?

3.12 Commercial & Industrial Construction Solutions

Commercial & Industrial Construction Solutions (C&I NC intended 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

3.12.1 IMPACT AND PROCESS EVALUATION APPROACHES

The impact and process evaluation approaches for the C&I NC program are the same as those described above in the SBS and Large C&I program sections.

Table 3-11: Commercial & Industrial Construction Solutions EM&V Activities & Sample Sizes

Activity	Sample	Impact	Process	Research Goals
ENO Staff Interviews	1		✓	Understanding program history, processes, lessons learned, and documentation of past evaluation recommendations.
TPA Interviews	1-2		✓	Understanding the outreach and QA processes, roles & responsibilities between ENO and implementation staff.
Tracking Data Review	Census	✓	✓	Checking tracking data for systematic errors in customer information, project information, or savings calculation.
Documentation Review	15	✓		Verifying that equipment detailed in energy savings calculations aligns with project invoices. Calculation of gross savings.
On-site Inspection / metering	6	✓		Field data collection to support facility simulation modeling for the gross impact evaluation.
Participant Survey	10	✓	✓	Verifying participation. Address customer satisfaction. Identify areas for program improvement.
Interim Participant Survey – Under Construction	8		✓	Survey of customers with projects in the construction phase, addressing customer experience with the program and intentions to comply with proposed building design.
Interim Participant Survey – Design / Blueprint	8		✓	Survey of customers with projects in the early design phase. Surveys will address customer perspectives on perceived risks and benefits in participating, and how program offerings are influencing design.
Trade Ally Interviews	5	✓	✓	Understand experiences of trade allies in the program. Identify how role of trade allies algins with program theory.

PUBLICLY FUNDED INSTITUTIONS PROGRAM

The Publicly Funded Institutions offering (PFI) 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
- Custom Non-Lighting

Impact and Process Evaluation Approaches

The impact and process evaluation approaches for the PFI program are the same as those described above in the SBS and Large C&I program sections.

Table 3-12: Publicly Funded Institutions Program EM&V Activities & Sample Sizes

Activity	Sample	Impact	Process	Research Goals
ENO Staff Interviews	2		✓	Understanding of program history, processes, lessons learned, and effect of past evaluation recommendations.
Third-party Implementor Interviews	2-4		✓	Understanding outreach and QA processes. Delineate roles & responsibilities between ENO and Implementor staff.
Deemed Savings Review	N/A	✓		Validation that savings assumptions apply TRM or other appropriate citations/calculations.
Tracking Data Review	N/A	✓	✓	Checking tracking data for systematic errors in customer information, project information, or savings calculation.
Project M&V	16	✓	·	Gross impact evaluation can include documentation and calculation review, participant surveys, on-site verification, metering, along with sampling and reporting.
Participant Survey	20	✓	✓	Verifying participation. Address customer satisfaction. Identify areas for program improvement. Conduct NTG data collection.
Qualified Trade Ally Interviews	3	✓	✓	Understand experiences of Trade Allys in the program. Identify how role of Trade Allys algins with program theory. Collect data to support Trade Ally-based NTG estimate.
Program Drop-out Surveys	10 participants	✓	✓	Survey drop-outs (customers that receive an audit but do not complete a project, Trade Allys that receive training but do not complete projects). Identify causes of drop-out. Identify potential spillover.

4 DEMAND RESPONSE PROGRAM IMPACT METHODOLOGY

This section provides specific impact evaluation approaches and general steps followed when performing evaluation of demand response programs. All approaches rely on hourly, or sub-hourly, AMI data to estimate savings impacts. Using AMI data for impact analyses greatly simplifies EM&V for all parties involved. For instance, there is no need to collect runtime data for AC units, perform metering, or request data from Smart Thermostat makers.

For programs where real-time measurement is desirable, The Evaluator develops internet browser accessible customizable tools for clients to be used internally and externally. These types of tools are often developed in the programming language R using the Shiny application. The tool would allow ENO to obtain near real-time savings results with parameters such as the type of model to use or the baseline selected by the user.
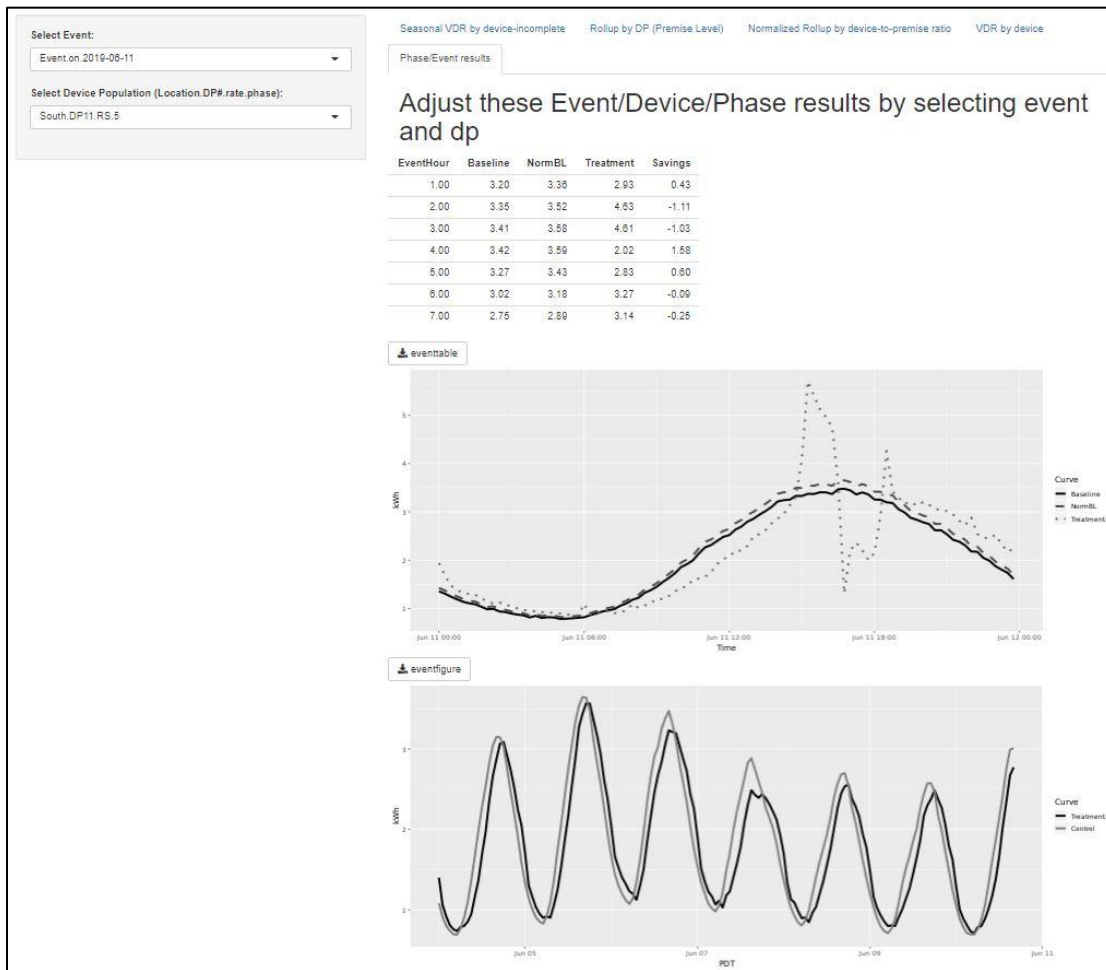

Figure 4-1 provides an example interface for a Residential DR program, where the output is the DR event savings by hour and the user can select the event date and device population.
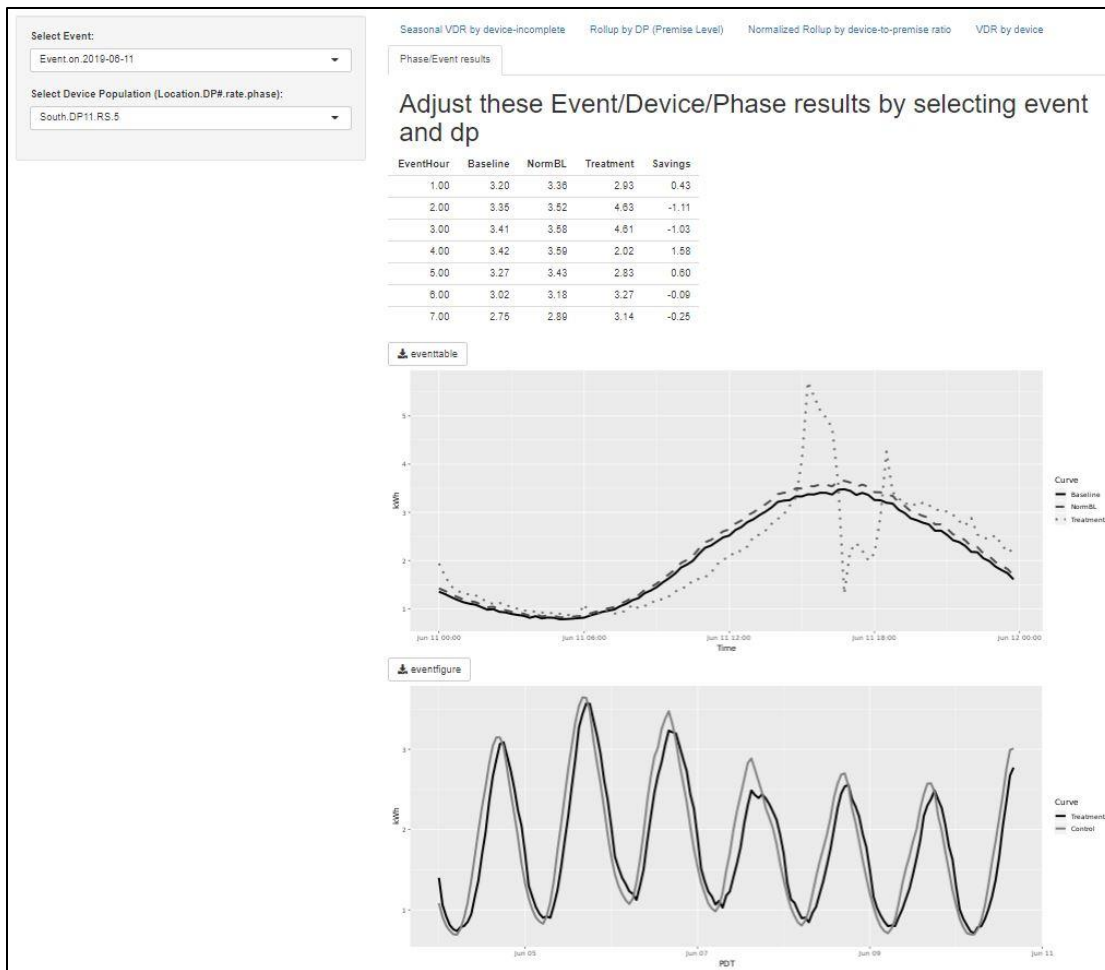
Figure 4-1: Residential Demand Response Shiny Tool Example

In general, the following impact evaluation steps are followed for most demand response programs:
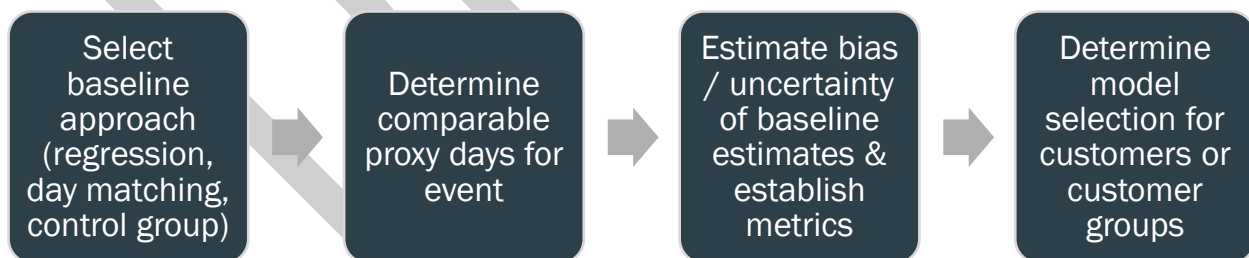

Figure 4-2: Demand Response Analysis Process Flow

The following sections provide details for specific baseline approaches.

4.1 Day Matching (i.e., Prior-Day Averaging)

With day-matching, DR impacts are estimated as the difference between a baseline reference value, intended to represent what load would have been if an event were not called, and actual load on an event day. Developing baseline reference load shapes involves either two or three steps, depending on the nature of the

load. The first step involves selecting relevant days and the second involves taking an average of the load in each hour for the days that were chosen. If loads vary with weather or other observable factors, a third step that can improve the reference load shape involves making "same day" adjustments to the initial load estimates. These adjustments can be based on differences between load in hours outside the event period on prior days and load during the same hours on the event day or on differences in the value of some other variable such as weather on prior days and event days.

As discussed previously, proxy days are used to test the accuracy of the baseline reference value using various statistics such that measure bias and error (e.g., average percent error, RMSE, etc.).

When considering what days to choose for the initial reference load calculation, for C&I customers, only business days are typically used. For residential customers, if events only occur on weekdays, weekends would logically be excluded from day selection as usage on weekends tends to be different on average from weekday usage. When it comes to using day-matching, one size does not fit all. What works best will vary with customer type, load shape, whether the load is weather sensitive, and other factors.

Below is a list of example methods which may be applied:

- Previous 3, 5, 7 or 10 business days or weekdays;
- Highest 10 out of 11 prior business days;
- Highest 5 of the last 10 business days;
- Highest 3 out of 10 prior business days with same-day adjustment two hours prior to the event;
- 20 days bracketing the event day; and
- All relevant days in an entire season.

"Same day" adjustment options include:

- **Additive Adjustment:** A constant is added to the provisional reference value for each hour of the curtailment period. For simple additive adjustment, the constant is calculated as the difference between the actual load and the provisional reference value load for some period prior to the curtailment. Ad hoc or judgmental adjustments are also possible.
- **Scalar Adjustment:** The provisional reference value load for each hour of the curtailment period is multiplied by a fixed scalar. The scalar multiplier is calculated as the ratio of the actual load to the provisional reference value load for some period prior to the curtailment.
- **Weather-Based Adjustment:** A model of load as a function of weather is fit to historical load data. The fitted model is used to estimate load (a) for the weather conditions of the days included in the provisional reference value, and (b) for the weather conditions of the curtailment day. The difference or ratio of these two estimates is calculated and applied to the provisional reference value as an additive or scalar adjustment.

There are at least three concerns that must be addressed when using prior-hour adjustments:

- **Gaming —** if the two hours prior to the event period are also used as part of the reference value for customer settlement, and this is known by the customer, a customer might intentionally increase energy use in the hours leading up to the event period to increase their reference value to receive a higher payment.
- **Pre-cooling —** a customer might increase cooling in the hours leading up to the event period to retain their comfort level longer if air conditioning is being controlled during the event.
- **Other pre-event adjustments —** a C&I customer might reduce manufacturing or business operations in anticipation of the event period.

If gaming or pre-cooling occurs, impact estimates based on the two hours prior to the event period will be overstated. Conversely, anticipatory behavior by customers, such as canceling production runs or encouraging office workers to work at home, could lead to under estimation of load impacts. These inaccuracies could still arise when earlier hours in the day are used rather than the two hours prior to the event period, but the bias may be smaller. However, for weather sensitive loads, using the earlier hours in a day may not be as accurate if temperatures increase significantly as the day progresses.

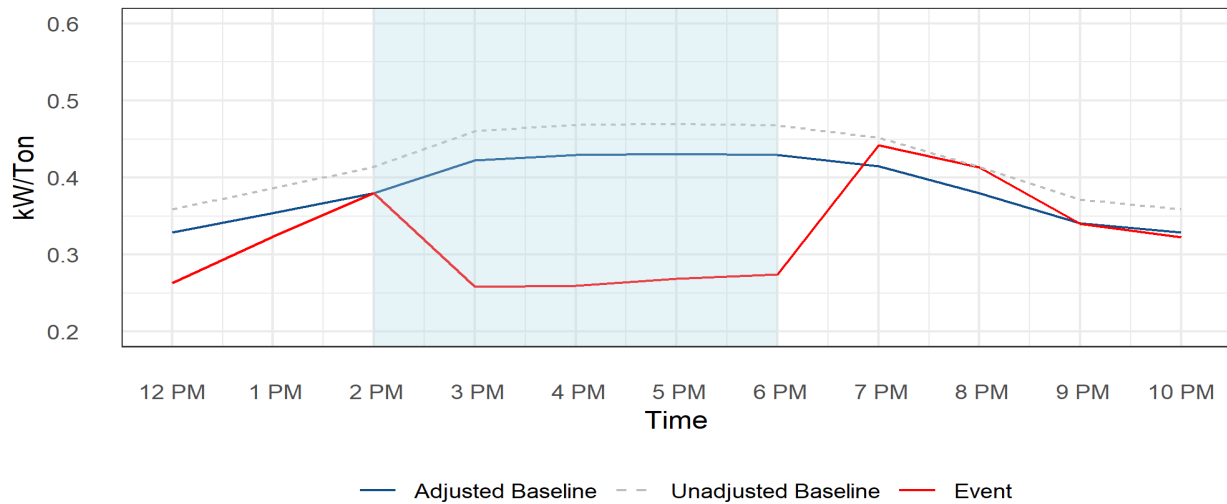Figure 4-3 displays a typical load profile and adjusted baseline utilizing this approach.

Figure 4-3: Event Load Profile

As shown in Figure 4-4, ADM is experienced in assessing the impact of various prior day averaging baselines on load reduction estimates (e.g., 3-in-5, 3-in-8, 5-in-10, etc.).
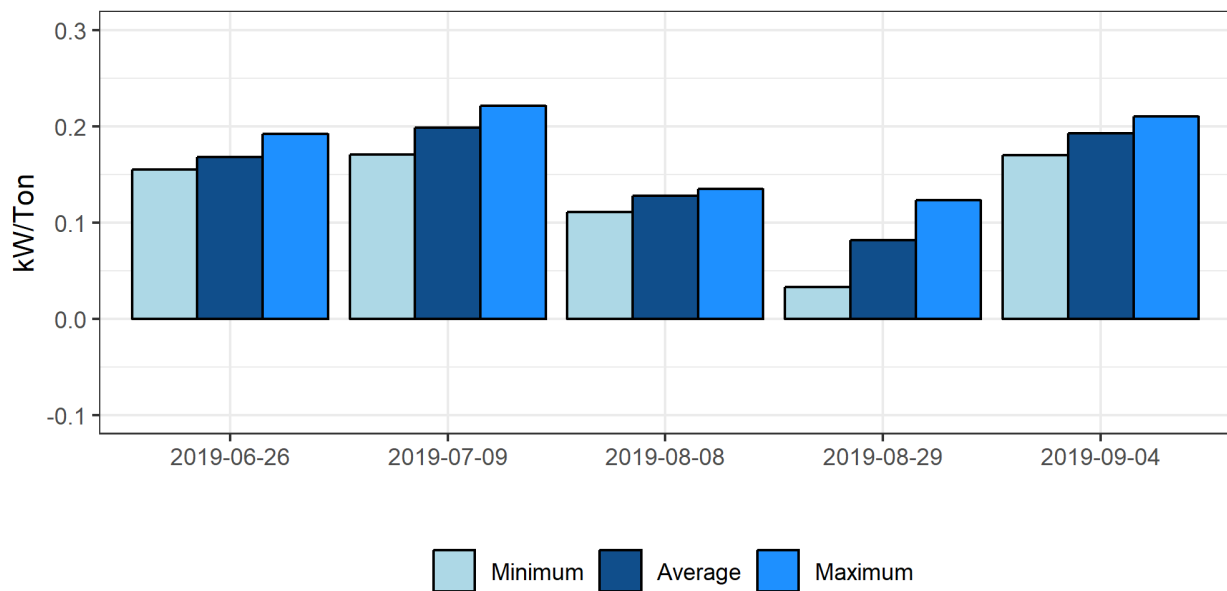

Figure 4-4: Variation in Load Reduction for Various Baseline Specifications

4.2 Regression

With regression modeling, demand reductions are estimated using a weather-adjusted *linear fixed effects regression* (LFER) model or other types of regression modeling. For example, the LFER model uses customers' 15-minute (or 1-hour) AMI data on event and non-event days to estimate the impact of DR events on energy demand. The model specifies energy demand as a function of temperature and other variables that influence usage. ADM will identify non-event days during the same month as demand response events where weather and load shapes most closely match patterns on event days, and these days serve as the counterfactual baseline.

A typical form of the regression model is shown below.

$$Usage\ (kWh)_{it} = \alpha_0 + \beta_1 CDH_{it} + \beta_2 PreCooling_{it} + \beta_3 Event_{it} + \beta_4 Snapback_{it} + \beta_5 MA24CDH_{it}$$
$$+ \sum_{h=1}^{24} \alpha_h * Hour_{it,h} + \sum_{i=1}^{n} c_i * Customer_i + \epsilon_{it}$$

Where:

α_0 is the intercept term;

t is the index for time intervals;

i is the index for the customer or device responding to the demand response event;

$Usage(kWh)$ represents average usage during the time interval;

$\beta_k, \alpha_h, c_i,$ are vectors of coefficients. The primary coefficient of interest is β_3 which provides the average kW reduction estimate during the demand response events;

CDH are cooling degree hours;

$PreCooling$ is a dummy variable for the three hours preceding an event;

$Event$ is a binary dummy variable for event hours;

$Snapback$ is a binary dummy variable for the three hours following an event;

$MA24CDH$ is a moving average of the last 24 hours CDH;

$Hour$ represents a vector of dummy variables for each hour of the day;

$Customer$ represents a vector of dummy variables for each customer or device; and

ϵ represents the error term.

Prior to running the model, ADM removes devices that fail to meet certain criteria, including:

- Missing customer zip codes (due to inability to map to correct weather data);
- Non-responding devices (NRD)[11] (optional); and
- Customer opt-outs (optional).

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[11] The Evaluator will typically investigate savings with and without NRD devices.

A device is considered a "non-responding device" (NRD) if it does not respond to the curtailment signal. Common causes of non-response are switch disconnections, A/C unit powered off, defective switches, or participant household wiring preventing communications.

4.3 Classification of Non-Responding Devices Using AMI Data

For large residential DR programs, ADM will identify non-responding devices and assess their impact on demand savings. Prior to the calculation of demand factors, non-responding devices are identified using a combination of two algorithms: a cumulative sum (CSUM) change in slope analysis and a straight 10% decrease in load detection. When a DR event is called, each device is sent curtailment instructions that result in a significant load drop over the event period. This drop is illustrated in Figure 4-5, where an example event is presented with an example "normal" usage curve.

The CSUM smoothing technique is a rolling sum defined as:

$$x = (a, b, c, \ldots, z) \ CSUM(x) = (a, a + b, a + b + c, \ldots, a + \ldots + z)$$

This is where x is a vector of kWh measures taken at increasing one-hour intervals during the event day. By taking the CSUM of each treatment site for the demand response period a smoothed, increasing curve is created (Figure 4-6). The slopes of this curve for the three hours before the event starts and the two hours of the event are calculated (Figure 4-6). To test if there is a significant change in the slope due to the demand response event, we first take the ratio of the event period slope divided by the pre-period slope. A responding device is detected by a decrease in the line slope, so the ratio will be less than one. Some sites have unique meter profiles that can confuse this first test, so a second test is applied. Test 2 uses the average meter curve for each site on baseline days to create a "site-normal" curve to compare with the event curve (Figure 4-5 and Figure 4-7). The same CSUM slopes are taken of the non-event curve and a ratio is measured (Figure 4-7). If the ratio of the non-event curve is greater than the ratio event curve, then the device is classified as responding. Any devices left over after the two tests are classified as non-responding.

In parallel with the CSUM analysis, a straight test for 10% reduction in consumption due to the event being called is also employed. For each unique device, the consumption for 1-hour pre-event and consumption for the first hour of the event (Figure 4-6) are analyzed for a drop greater than 10% using the following:

$$Non - Responding \ if \ T1_{kWh} \le T2_{kWh}, where$$

$$T1_{kWh} = PreHr_{kWh} - EventHr_{kWh} \ and \ T2_{kWh} = PreHr_{kWh} * 10\%$$

These two lists of non-responding devices are then cross-referenced, and those devices identified by both methods are removed from the analysis subgroup.

By taking advantage of the processing speed of vectorized programming in the R-Studio environment, every individual site in the program is tested per event.
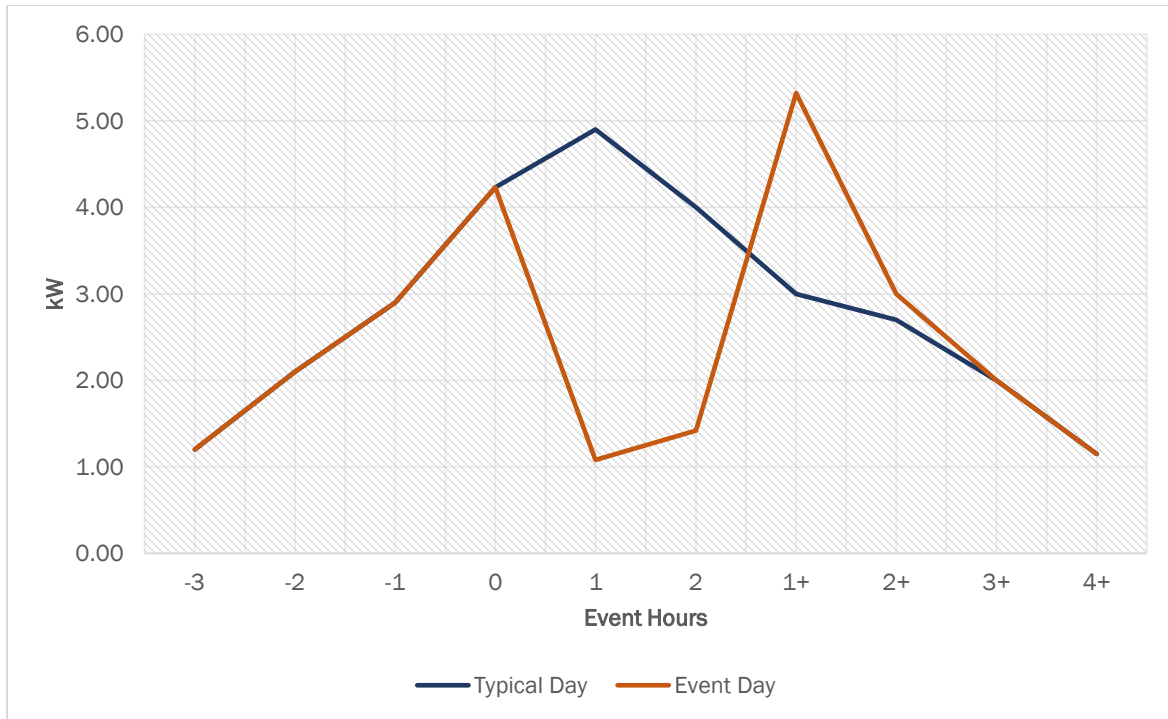
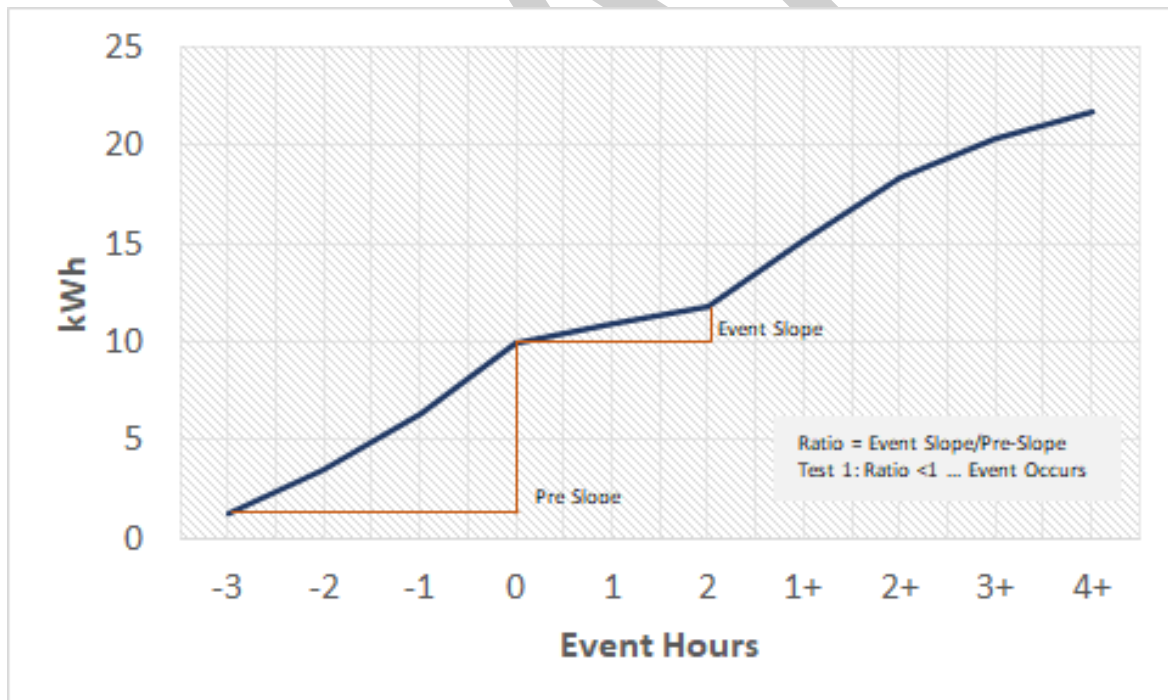Figure 4-5: Example of Site-Level Load Shapes During Event Hours

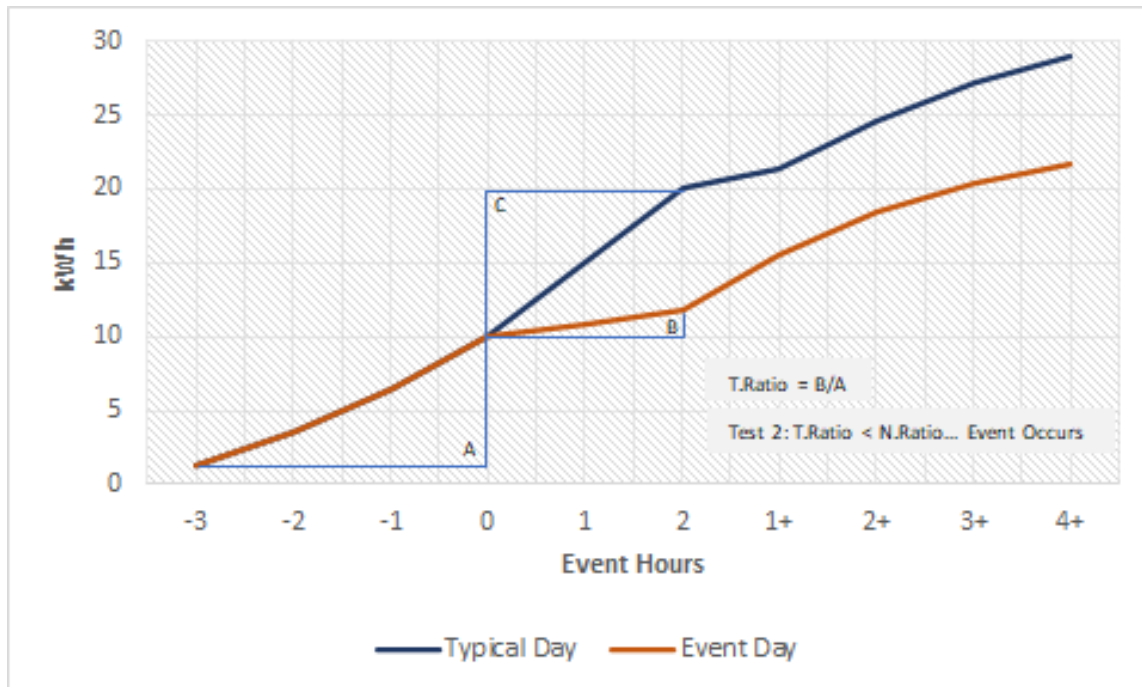Figure 4-6: Example of Site-Level CSUM Slope Changes During Event Hours

Figure 4-7: Example of the CSUM Change in Slope Analysis used to Identify NRDs

4.4 Control Group Estimation

An additional method that could be used is the control group baseline approach. For programs where a randomized control group (RCT) it used, a control group's usage will serve as the baseline. Without an RCT approach, a control group can be created using matching techniques (e.g., Propensity Score Matching). Under the matching control group approach, meter data for a sample of non-participating customers is obtained and then matched to participant customers based on site characteristics and load similarity. Direct matching of the treatment and control sites is based on zip code. Propensity score matching may further be used to match based on square footage and age of homes (e.g., for residential programs). This pool of control sites is then re-matched for each event based on the total kWh usage over the previous seven (non-event) weekdays. For each treatment premise, the total load is directly matched to the closest loads from control premises. Then this control subgroup is matched one-to-one to each treatment premise. This process is designed to select control groups that match the treatment subgroup premise's characteristics and consumption patterns as closely as possible. The resulting matched control group is significantly better fit to the treatment group than a random sample of control premises.

Even with the matched control groups, there may be a consistent difference between the two groups, which would bias the DR load impacts if one were to simply take the different of the two. An adjustment factor is calculated as the ratio of the average treatment group load and the average control group load during the hour prior to the event. Devices that employ a pre-cooling strategy where the home or site is cooled during a period of up to two hours immediately prior to the event, use the third hour before the event to calculate the adjustment ratio.

4.5 Other Methods

Other methods that may be suitable or even preferred in selected situations include sub-metering, engineering analysis, duty cycle analysis and experimentation.

4.6 MISO Demand Response Resource Performance Assessment

The Midcontinent Independent System Operator, Inc. (MISO) Business Practices Manual (BPM)[12] details the following M&V criteria for Demand Response Resources (DRR). The following four baseline methods are allowed by MISO:

- Metered Generation
- Calculated Baseline
- Direct Load Control (DLC); and
- Custom Baseline.

Metered Generation is only applicable for behind-the-meter generation (e.g., solar or battery storage) and would not be applicable to most ENO DR programs. DLC and Custom Baseline involve custom-type M&V methodologies that must be approved by MISO. Most ENO DR programs would fall in the category of the Calculated Baseline, which corresponds to the Day Matching method referenced in the section above, with an approach specific to MISO in the Calculated Baseline section below.

4.6.1 METERED GENERATION

This type of Consumption Baseline only applies to behind-the-meter generation (btmg). For a btmg resource, the Consumption Baseline is the resource's actual metered generation over the hour beginning two hours prior to the hour in which the DRR is initially instructed to reduce load. The DRR's deemed demand reduction in response to a dispatch instruction in any hour is the difference between its metered output and its Consumption Baseline.

4.6.2 CALCULATED BASELINE

This type of Consumption Baseline only applies to demand resources that actually reduce load. For a demand resource the Consumption Baseline is a profile of hourly demand (for the load behind the DRR asset) based on an averaged sample of historical data which may be adjusted for factors that reflect specific, on-the-day conditions, such as temperature. Unless the Market Participant sponsoring the DRR submits an alternative design for MISO approval, the default Consumption Baseline will be designed as follows:

- Separate hourly demand profiles will be determined for non-holiday weekdays and for weekends/holidays
- The "weekday" hourly profile will be 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 will be 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 will be limited to 45 days

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[12] https://www.misoenergy.org/legal/business-practice-manuals

- If the 45-day window contains insufficient days to meet the minimum number of days described above, the profiles will be 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.

The Market Participant sponsoring a DRR will have the option (at registration) to accept the unadjusted Consumption Baseline or to modify it by applying one of the following adjustment mechanisms:

4.6.3 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.

4.6.4 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.

If the Market Participant sponsoring a DRR wishes to select either of the Adjustments described above or one of the non-default Consumption Baselines, the Market Participant must submit appropriate documentation to MISO for approval. Documentation must be credible and replicable analysis that supports the use of the applicable adjustment. The WSA baseline approach requires a complete, rigorous, and defensible study or report that shows the complete statistical methods and analysis used to determine the Weather Adjustment Factor. The SMA baseline approach requires three (3) months of hourly data to be submitted with analysis used to justify the approach. Submitted documentation will be shared with the applicable LSE.

Calculated Baselines will not be adjusted for events beginning prior to 5:00 am Eastern Standard Time.

4.6.5 DIRECT LOAD CONTROL

This type of baseline only applies to direct load control (DLC) programs consisting of many small, distributed resources that are not interval metered; consequently, only DRR-Type I resources are eligible.

A DLC Consumption Baseline will be statistically estimated from hourly metered demand data. MISO must approve the specific statistical methodology to be employed before the Market Participant can use a DLC Consumption Baseline. The input provided for the DLC Consumption Baseline becomes the performance (demand reduction) for that resource during an Event.

4.6.6 CUSTOM BASELINE

The Market Participant sponsoring a DRR may develop a custom Consumption Baseline if none of the three standard baselines would produce reasonable estimates of the resource's demand reductions. MISO must approve of the specific methodology to be employed before the Market Participant can use such a baseline. For custom Consumption Baselines, the input provided becomes the Consumption Baseline that will be subtracted from metered amounts to determine performance (demand reduction).

4.7 Large C&I DR Program Approach

ADM will follow the Calculated Baseline approach outlined in Section 4.6 MISO Demand Response Resource Performance Assessment for most Large C&I DR programs. Direct Load Control (DLC) programs are a notable exception. The benefit of this approach is that savings for DR programs will be calculated according to MISO DR protocols, and ENO will be able to gauge expected savings for DR programs that in the future might contribute to MISO DR events.

The following impact evaluation steps will be taken to determine the suitability of the MISO Calculated Baseline approach:

- Develop an Unadjusted Consumption (UC) Baseline, a Symmetric Multiplicative Adjustment (SMA) Baseline, and a Weather Sensitive Adjustment (WSA) Baseline for each program participant. The use of all three baselines will increase the likelihood that weather-sensitive and weather-insensitive customers will obtain the appropriate baseline. Loads will be calculated utilizing 1-hour AMI data.
- Assign the baseline with the lowest bias and/or error to each customer.
- Determine days that will serve as proxy days for testing the suitability of the baseline approach. Proxy days represent days similar to demand response event days in terms of load shape and temperature profiles.
- Estimate bias (uncertainty) and error on proxy days to assess baseline performance. Bias is assessed by examining the average percent error (among other metrics) 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.
- Determine model selection for the DR program cohort on an individual customer basis, for a subgroup of customers, or for the entire program population, with the goal of minimizing bias and error for the program. Models can be fit on a customer-specific basis for commercial programs, and this significantly reduces the uncertainty and error of savings estimates. For example, some customers could be assigned Unadjusted Consumption Baselines, while other customers are assigned SMA or WSA Baselines.
- In the advent that bias and error on proxy days remain high for the DR program, ADM will use regression, control group, or custom methods as warranted and subject to data availability. An example of a regression-based method is provided in Section 4.2. In addition, a discussion of a control group estimation method is provided in Section 4.4.

In addition, ADM will examine the accuracy of baseline predictions for the largest C&I customers on a customer-specific basis as savings for these customers will have the largest impact on program savings.

4.8 Residential DR Program Approach

ADM will follow the Calculated Baseline approach outlined in Section 4.6 MISO Demand Response Resource Performance Assessment for most residential DR programs. The benefit of this approach is that savings for DR programs will be calculated according to MISO DR protocols, and ENO will be able to gauge expected savings for DR programs that in the future might contribute to MISO DR events.

The following impact evaluation steps will be taken to determine the suitability of the MISO Calculated Baseline approach:

- Develop an Unadjusted Consumption (UC) Baseline, a Symmetric Multiplicative Adjustment (SMA) Baseline, and a Weather Sensitive Adjustment (WSA) Baseline for each program participant. The use of all

three baselines will increase the likelihood that weather-sensitive and weather-insensitive customers will obtain the appropriate baseline. Loads will be calculated utilizing 1-hour AMI data.

▪ Assign the baseline with the lowest bias and/or error to each customer. This step is a common practice for Large C&I DR programs because commercial customers display more heterogenous load shapes than residential customers, however, selecting models on a customer-specific basis greatly improves the baseline estimates for residential DR programs. ADM maintains a library of functions and packages for this purpose. The computationally challenging demand of running multiple models for each customer in a large residential DR program is greatly reduced by using the R statistical programming language with its ability to run processes in parallel.

▪ Determine days that will serve as proxy days for testing the suitability of the baseline approach. Proxy days represent days similar to demand response event days in terms of load shape and temperature profiles.

▪ Estimate bias (uncertainty) and error on proxy days to assess baseline performance. Bias is assessed by examining the average percent error (among other metrics) 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.

▪ Determine model selection for the DR program cohort on an individual customer basis, for a subgroup of customers, or for the entire program population, with the goal of minimizing bias and error for the program. Models can be fit on a customer-specific basis for residential and commercial programs, and this significantly reduces the uncertainty and error of savings estimates. For example, some customers could be assigned Unadjusted Consumption Baselines, while other customers are assigned SMA or WSA Baselines.

▪ In the advent that bias and error on proxy days remain high for the DR program, ADM will use regression, control group, or custom methods as warranted and subject to data availability. An example of a regression-based method is provided in Section 4.2. In addition, a discussion of a control group estimation method is provided in Section 4.4.

4.9 Residential DR Programs

4.9.1 SMART THERMOSTAT (BRING YOUR OWN THERMOSTAT)

The Smart Thermostat Bring Your Own Thermostat (BYOT) demand response program is an offering 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 that will in turn curtail HVAC usage during the peak period.

The impact analysis for the Smart Thermostat (Bring Your Own Thermostat) program will be performed in accordance with Section 4.8: Residential DR Program Approach.

Table 4-1 details the evaluation activities that will be performed for the program.

Table 4-1: Smart Thermostat (BYOT) Program EM&V Activities & Sample Sizes

Activity	Sample	Gross	Process	Research Goals
ENO Staff Interviews	3-5		✓	Understanding of program history, processes, lessons learned, and effect of past evaluation recommendations.
TPA Interviews	2-4		✓	Understanding outreach and QA processes. Delineate roles & responsibilities between ENO and TPA staff.
Impact Analysis	Census	✓		Estimation of baseline usage and calculation of demand savings using hourly AMI data in accordance with MISO protocols.
Tracking Data Review	N/A	✓	✓	Checking tracking data for systematic errors in customer information, project information, or savings calculation.
Document Review	N/A		✓	Review of program marketing materials, planning documents, program website, and other program materials.
Participant Survey	50		✓	Address customer satisfaction. Identify areas for program improvement.

4.9.2 ELECTRIC VEHICLE CHARGING (PILOT)

The Electric Vehicle Charging (Pilot) demand response program is a pilot program still in development by ENO. Impacts occurring in ENO's defined peak period will be summarized for the program. If the program is designed to provide an incentive to customers to charge outside the peak or decrease the charger's energy usage during peak hours, it stands to reason that this will result in shifting away from peak demand periods to off-peak periods for charging

The impact analysis for the Electric Vehicle Charging (Pilot) program will be performed in accordance with Section 4.8: Residential DR Program Approach.

Table 4-2 details the evaluation activities that will be performed for the program.

Table 4-2: Electric Vehicle Charging (Pilot) Program EM&V Activities & Sample Sizes

Activity	Sample	Gross	Net	Process	Research Goals
ENO Staff Interviews	3-5			✓	Understanding of program history, processes, lessons learned, and effect of past evaluation recommendations.
TPA Interviews	2-4			✓	Understanding outreach and QA processes. Delineate roles & responsibilities between ENO and TPA staff.
Impact Analysis	Census	✓			Estimation of baseline usage and calculation of demand savings using hourly AMI data in accordance with MISO protocols.
Tracking Data Review	N/A	✓		✓	Checking tracking data for systematic errors in customer information, project information, or savings calculation.

Activity	Sample	Gross	Net	Process	Research Goals
Document Review	N/A			✓	Review of program marketing materials, planning documents, program website, and other program materials.
Participant Survey	50			✓	Address customer satisfaction. Identify areas for program improvement.

4.9.2.1 Comparing Baseline Methods

ADM will examine event impacts using multiple baseline methods. The primary method will be selection of a control group (a random subset that do not receive a curtailment signal when an event is called). This is in practice the most accurate baseline method but can be problematic for small-scale programs as it is a repeated labor charge to develop for each event and removes customers from program treatment.

To test whether this mode is necessary, ADM will examine load impacts simultaneously with multiple baseline methods on events that have a control group. In addition to this control group comparison, prior-day matching using just treatment customers will be completed with results compared for the same event. For HVAC load control programs, prior-day methods often comprise selection of days with the highest average outdoor temperature, selecting a subset such as "three of five", "three of ten", etc. prior days that are non-holiday, non-event weekdays. There is then a prior-hour adjustment to re-scale this average, where values are multiplied by the ratio of event day kW for the hour prior to event start divided by average baseline day for the same hour. For EV charging, this runs the risk of omitting important data as charging may not occur every day. Based on this, ADM proposes that the primary comparison be against a 10:10 baseline (10 prior non-holiday non-event weekdays), each tested with and without day-of load adjustments. Other baselines considered include 3 of 10 and 5 of 10.

4.9.2.2 Weather Normalization

The control group baseline method is based on a basic DiD analysis of impacts during the pilot period. To extrapolate to program-scale, ADM will weather-normalize impacts. Though vehicle charging is not directly a weather-sensitive load, this extrapolation will serve to capture seasonal variation in driving (for example, total driving could be higher during warmer weather due to increased travel, but this is not strictly "weather sensitive").

4.9.3 PEAK TIME REBATE (PILOT)

The Peak Time Rebate (Pilot) demand response program is a pilot program still in development by ENO. The program will offer incentives on non-critical peak days for customers able to reduce or shift demand during peak days. Impacts occurring in ENO's defined peak period will be summarized for the program.

The impact of the Peak Time Rebate (Pilot) program on whole-home usage during the DR event will be performed in accordance with Section 4.8: Residential DR Program Approach.

Table 4-3 details the evaluation activities that will be performed for the program.

Table 4-3: Peak Time Rebate (Pilot) Program EM&V Activities & Sample Sizes

Activity	Sample	Gross	Net	Process	Research Goals
ENO Staff Interviews	3-5			✓	Understanding of program history, processes, lessons learned, and effect of past evaluation recommendations.
TPA Interviews	2-4			✓	Understanding outreach and QA processes. Delineate roles & responsibilities between ENO and TPA staff.
Impact Analysis	Census	✓			Estimation of baseline usage and calculation of demand savings using hourly AMI data in accordance with MISO protocols. Impacts on customer bills.
Tracking Data Review	N/A	✓		✓	Checking tracking data for systematic errors in customer information, project information, or savings calculation.
Document Review	N/A			✓	Review of program marketing materials, planning documents, program website, and other program materials.
Participant Survey	70			✓	Address customer satisfaction. Identify areas for program improvement.

4.10 Large C&I DR Programs

4.10.1 LARGE C&I DEMAND RESPONSE

The Large Commercial & Industrial Demand Response (DR) offering launched in April 2021 with an objective to secure a total of 9.3 megawatts (MW) of commercial demand shed over term of the program cycle. Large commercial customers (exceeding 100kW peak demand) are being recruited and enrolled for an automated turn-key DR solution. An advanced software platform, Concerto®, was deployed for dispatch, control and optimization of all DR resources enrolled in the offering. Concerto is used 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.

The Large C&I DR program will include the following offerings:

- The Building Energy Management System Control Demand Response program includes demand response solutions for HVAC, Other Chilling/Refrigeration Systems, Lighting, and Water Heating.
- The Motor or Process Load Control Demand Response program includes demand response solutions for Industrial Processes, Pumps, and Compressed Air.
- Alternative Large C&I curtailment options offering two-way control (curtailment or load shaping solutions that are emissions free will be granted preference for this procurement)

ADM will quantify program impacts for the various offerings. For instance, automated versus unautomated DR solutions will be analyzed separately to determine which solutions offer the greatest demand reduction potential.

The impact analysis for the Large C&I Demand Response program will be performed in accordance with Section 4.7: Large C&I DR Program Approach.

Table 4-4 details the evaluation activities that will be performed for the program.

Table 4-4: Large C&I DR Program EM&V Activities & Sample Sizes

Activity	Sample	Gross	Net	Process	Research Goals
ENO Staff Interviews	3-5			✓	Understanding of program history, processes, lessons learned, and effect of past evaluation recommendations.
TPA Interviews	2-4			✓	Understanding outreach and QA processes. Delineate roles & responsibilities between ENO and TPA staff.
Impact Analysis	Census	✓			Estimation of baseline usage and calculation of demand savings using hourly AMI data in accordance with MISO protocols.
Tracking Data Review	N/A	✓		✓	Checking tracking data for systematic errors in customer information, project information, or savings calculation.
Program Documentation Review	N/A			✓	Review of program marketing materials, planning documents, program website, and other program materials.
Participant Survey	5-10			✓	Address customer satisfaction. Identify areas for program improvement.

5 TECHNICAL REFERENCE MANUAL UPDATES

This section details the proposed scope of work for annual updates and verification of the New Orleans Technical Reference Manual (TRM).

5.1 Previous TRM Contributions

ADM is in the unique position of having authored and updated the current New Orleans TRM. While it's common practice for new TRMs to consist of a selection of copied and pasted deemed measure sections from existing TRMs, the New Orleans TRM is based in primary data collection concurrent with program evaluation.

The following EM&V studies have been completed, allowing for incorporation of primary data into the TRM:

- Metering of residential air conditioning runtime, applied to AC replacement and duct sealing;
- Field assessment of average SEER for air conditioning units in duct sealing projects;
- Billing analysis to support reductions achieved from residential air conditioning tune-ups;
- Measurement of residential domestic hot water (DHW) temperature setpoints, incorporated into DHW replacements and low flow devices;
- Metering of residential lighting run-time; and
- Metering of commercial lighting run-time and peak CF for 10 unique the facility types and 8 unique space types.

This primary data collection has gone on to inform, on average, 90.3% of portfolio savings in following program years. Further, ADM has authored or made contributions to:

- The New Mexico TRM (original authorship, updates)
- The Idaho TRM (original authorship, updates)
- The Pennsylvania TRM (measure development)
- The Regional Technical Forum (measure development)

5.2 Future TRM Updates

When PY13 EM&V starts, ADM anticipates that New Orleans TRM 6.0 will be in place. The content of this TRM will inform impact evaluation activities in that ADM would use the impact evaluation to:

- Collect additional data for TRM measures that demonstrate high uncertainty; and
- Collect data for TRM measures that do not currently have any Louisiana-specific evaluation support (i.e., measures that only use secondary references).

With this in mind, impact evaluation will be used to better-define deemed savings estimates, and non-evaluated measures will receive stipulated savings in accordance with the New Orleans TRM.

5.2.1 RE-ESTIMATE SAVINGS FOR CURRENT MEASURES

In this task, ADM will re-estimate savings for selected current measures whose savings are determined to be unreliable. The work for each measure will be conducted as follow:

- **Louisiana Evaluation Data.** Available sources identified by the literature search may not provide adequate data. For these cases, we will specify the data that should be collected as part of Louisiana program evaluations to support re-estimation of the measure savings. Proposed data collection will be submitted for review and approval.

- **Revision of TRM.** Using the best available data from either the literature search or evaluations, we will re-estimate savings for each measure. If evaluation data is used, that data collection will have to be complete and fully analyzed before it can be used as a source in the re-estimation. We will revise as needed TRM documentation of the savings values, savings estimation method, specification of eligible applications and data sources. A draft of revisions for each measure will be submitted to relevant parties for review and comment. We will address the comments received and prepare a final version for addition to the TRM.

5.2.2 ADDITION OF NEW MEASURES TO TRM

In this task, ADM will develop new measures for addition to the TRM. This will be accomplished as follows:

- **Measure Specification.** We will discuss the characteristics and application of the new measure with appropriate parties. Based on these discussions, we will describe the measure, its likely applications, and any eligibility criteria that would be used in developing appropriate savings values. A draft description of the measure would be submitted for review and comment. We will finalize the measure specification following receipt of these comments

- **Literature Search.** A search will be conducted of ACEEE, CALMAC, IEPEC, CEE, DOE Technical Support Documents (TSDs), ENERGY STAR, TRMs from other states, and California DEER for primary research that might be useful. Promising sources will be reviewed to determine whether they are useful. In addition, any sources identified by ENO will be obtained if readily available and reviewed.

6 SPECIAL STUDIES

The current EM&V budget allocation does allow for flexibility as it pertains to specials studies, surveys, or research opportunities that would benefit the programs. With our in-house research staff and the capabilities and expertise of our subcontractors, the ADM Team can (if needed) direct evaluation efforts to address issues that may be of concern to Entergy, the Council and their Advisors. As EM&V priorities shift towards forward-looking research as Energy Smart programs mature, ADM will work with Entergy New Orleans, the Advisors, and other relevant stakeholders in establishing research priorities for the next triennial cycle.

7 MEASUREMENT & VERIFICATION SUPPORT SERVICES

ENO desires M&V Support Services from the program evaluator. These services may include developing M&V approaches for custom projects or adding measures to the TRM.

7.1 Custom Project M&V Approaches

ADM has significant experience and demonstrable history in provide evaluation support for custom projects. As examples:

- **Entergy New Orleans Parallel Path M&V.** As discussed in our general approach section, ADM has consistently conducted pre-installation M&V for custom projects exceeding $20,000 in incentive amount or 500,000 kWh in expected savings. This has mitigated significant risk for ENO, as their largest projects are paid on ex-post verified savings.
- **Arkansas Gas Utilities: C&I Custom Solutions.** On behalf of CenterPoint Energy Arkansas, Black Hills Energy Arkansas, and Arkansas Oklahoma Gas, ADM conducts EM&V for their portfolios of Comprehensive Efficiency Programs. This portfolio includes the C&I Solutions Program, implemented by CLEAResult. In these evaluations, ADM has worked collaboratively with CLEAResult to develop a framework in which every custom project is sent to ADM for EM&V review prior to project installation. In this process, we review the scope, assumptions, and data needs, and provide feedback to CLEAResult as to any changes recommended. The outcome of this is that the right data is collected the first time and ADM and CLEAResult then conduct project analysis in-parallel. The result is then used as the basis for payment to the customer, and the savings for that project are not revised further.
- **FirstEnergy Pennsylvania Operating Companies.** In FirstEnergy's Custom Efficiency Program, all projects receive M&V review, as per Pennsylvania evaluation protocols. ADM has adopted a similar review system for Pennsylvania as specified above for Arkansas, also using CLEAResult as implementation contractor. This system has been successful in mitigating custom project risk and ensuring good stewardship of ratepayer funds.

As demonstrated in these two examples, evaluating a census of large custom projects has been established as standard practice by ADM in the evaluation of Energy Smart programs, and we can cost-effectively conduct this through the TRM of our local full-time engineering staff.

7.2 Measure Studies for TRM Inclusion

On an *ad hoc* basis, ENO or implementation staff may request that the evaluator conduct a measure study for inclusion in the TRM. This is not-an uncommon request for evaluation contractors, and we have completed similar requests for Energy New Orleans as well as numerous utilities elsewhere.

- For the New Orleans TRM, ADM has conducted measure studies for technologies that encompass more than 80% of portfolio savings.
- For the past 15 years, ADM has been under contract with the Sacramento Municipal Utility District (SMUD) to conduct new technology pilot studies as a testing ground before full program implementation.
- In New Mexico, ADM conducted an M&V study of Oil Well Pump-Off Controllers (POCs), enabling these to enter Xcel Energy's prescriptive program. The move from a custom protocol to prescriptive protocols resulted in participation increasing by over 10-fold for this technology.

ADM would review the technology proposed by ENO, implementation contractors, or other stakeholders and assess it on the following criteria:

1) Can the technology have deemed savings parameters established in a manner which provide adequate certainty?
2) Is the technology in-of-itself cost effective? (i.e., when addressing the cost and savings for one installation, does this measure pass TRC)
3) Can the ENO service territory support enough uptake of this measure for macro-level cost-effectiveness? (e.g., if said technology were to be implemented 100 times, would the aggregate savings be adequate to overcome administrative and marketing costs associated with implementation to support program-level TRC).

The Evaluator would then develop a pilot study work plan, to be reviewed by implementation contractors, ENO, the Advisors, and any applicable vendors (in the case of a vendor-specific technology). With this in mind, we would then establish an allowable installation quota to support the measure pilot and conduct end-use metering or simulation (as appropriate) to support development of deemed savings and incremental cost values for this measure.

**Report of Entergy New Orleans, LLC Identifying its Selection of
Third Party Administrators and Evaluator of the Energy Smart Programs in
Council Utility Docket UD-08-02; UD-20-02**

I. Introduction

Entergy New Orleans, LLC ("ENO" or the "Company") submits this report identifying its selection of the consultants to support the implementation of the Energy Smart Programs for Program Years ("PY") 13-15, running from January 1, 2023 through December 31, 2025. As a result of the Request for Proposals ("RFP") process required by Council Resolution R-20-51 and described below, ENO has selected Aptim Environmental ("Aptim"), Honeywell Smart Energy ("Honeywell"), Sagewell, and National Theater for Children ("NTC") as Third Party Administrators ("TPA") and ADM Associates ("ADM") as the Third Party Evaluator ("TPE"). ENO requests Council assent to the selections described herein.

II. RFP Timeline and Process

Task	Date Completed
RFP Issued	12/21/2021
Pre-bid Conference Call	1/11/2022
Proposal Submission Deadline	2/16/2022
Bid Finalists Interviewed	3/21/2022 – 3/29/2022
Bidder Evaluations Completed	Early May 2022

A total of 14 companies submitted proposals and all bids were advanced to the final round.

Type of Proposal	Number Received
Energy Efficiency TPA (Multiple Programs)	2
Demand Response TPA (Multiple Programs)	4
Behavioral Program	4
Pilot Programs	7
Schoolkits Program	3
Third Party Evaluator	2

III. Third Party Administrator Selection

A. Details of Energy Smart Programs and APTIM's Bid

APTIM, as TPA, will be required to design, implement, deliver and administer the Energy Smart Programs below.

The programs that APTIM has been selected to implement are as follows:

Energy Efficiency Programs

- Home Performance with Energy Star ("HPwES")
- Energy Smart for Multifamily
- AC Solutions
- Residential Lighting and Appliances
- NOLA Wise School Kits & Outreach
- Income Qualified Weatherization
- Residential Behavioral (Aptim/Bidgely)
- Large Commercial & Industrial Solutions
- Small Commercial & Industrial Solutions
- Publicly Funded Institutions

Demand Response Programs

- Residential Bring Your Own Thermostat ("BYOT") (Aptim/EnergyHub)
- Residential Peak Time Rebate (Aptim/Bidgely)

Additionally, in its role as TPA for Energy Smart, APTIM shall be responsible for development, oversight and execution of all programmatic and project management related functions necessary to effectively implement, deliver and administer the programs set-forth in the plan. These major areas of responsibilities are defined in the Scope of Work section of the ENO RFP. These responsibilities shall include, but not be limited to the following:

- Program Design, Implementation and Delivery;
- Marketing;
- Data Management and Tracking;
- Quality Assurance and Control ("QA/QC");
- Program Evaluation and Interaction with the TPE; and
- General Administration, Funds Management
-

B. Basis for Selection

APTIM's proposal submission included a well-designed program, implementation, and delivery strategy that contained plans to enhance the current programs. APTIM has an established local office with a significant presence in Louisiana and specific expertise in administering southern climate demand side management programs. In addition, the selected bidder clearly demonstrated in its proposal an understanding of customer needs, the local contractor market and local building stock.

As the Energy Smart TPA since 2017 Aptim has delivered award-winning programs despite navigating through the effects of the Covid pandemic and Hurricane Ida. Additionally, APTIM has a successful track record with programs similar to those required in the Energy Smart plan in Wisconsin, at Duke Energy, and AEP.

Key components of the selected bid include:

- An established Louisiana presence with current offices in New Orleans and Baton Rouge.

- Recognized as one of the nation's leading energy management service providers.

- Partnering with industry-recognized subcontractors:
  - Franklin Energy is also recognized as an industry leader with residential energy efficiency program implementation as its core business.
  - Bidgely uses complex disaggregation algorithms and AMI data to provide Behavioral program participants more detailed information and tips. Bidgely has implemented successful programs in Washington, Idaho and Nevada.
  - EnergyHub has deployed over 60 BYOD programs across the country, representing a portfolio of over 2,900 MW of DERs under management, the most in the industry.

- Team of experienced staff and local contractors:
  - two core contractors are Disadvantaged Business Enterprises ("DBEs").
  - 10% of contract work devoted to DBEs

- 25% of implementation costs are at-risk
- Partnerships are New Orleans based:
  - Subcontractors
  - Non-Profits
  - Trade Associations
  - Universities

- Detailed plan to recruit and train participating local contractors.

- Detailed training process for contractors.

- Prepared to roll out new programs following contract execution and implementation plan approval.

- Addressed the importance of customer satisfaction and stakeholder involvement throughout the proposal.
  - Provided a customer dispute resolution process.
  - Provided training and corrective action plan for local contractors.

- A portion of the TPA's compensation is tied to their performance.
  - Performance metrics based on kWh savings and customer satisfaction metrics.
  - 25% of implementation costs are at-risk

- Proven Data Management/Tracking system allows for more rapid program roll out.

- Proposal is for a comprehensive set of programs

- Proven ability to deliver award-winning energy efficiency programs
  - APTIM has won awards with its Wisconsin Energy program

- Proposed costs are in-line with other bidders

- Financially sound company with a track record of success in business ventures

- Desire to involve stakeholders through the administration of a stakeholder advisory panel

IV.   Third Party Evaluator Selection

A.   Details of ADM's Bid

ADM submitted a proposal to handle the Evaluation Measurement & Verification ("EM&V") services for the Energy Smart programs for the time period, January 1, 2023 - December 31, 2025. These major areas of responsibilities are defined in the Scope of Work section of the ENO RFP. These responsibilities include, but are not limited to:
- Developing both impact and process evaluations annually;
- Updating the New Orleans Technical Reference Manual;
- Performing Field Audits; and
- Measurement and Valuation Support Services

Applicable portions of the RFP response are being provided under separate cover to the Council Advisors pursuant to the terms of the Council's Official Protective Order in Docket UD-08-02.

B.   Basis for Selection

ADM submitted a very detailed and comprehensive proposal which covered Energy Smart's EM&V requirements. ADM provided detailed plans for their approach to impact and process evaluation. Having worked with ENO since 2015, ADM has been a valuable contributor to the Energy Smart program providing annual EM&V analysis and reports; creating and updating the New Orleans Technical Reference Manual; and performing other ad hoc projects such as the Arrearage and Disconnect analysis.

Key components of the selected bid include:

- Familiarity with the New Orleans climate and energy efficiency environment, having performed EM&V in New Orleans and throughout the state of Louisiana.

- Proven record of evaluations in many states including Louisiana, Arkansas, California, Ohio, Oklahoma, Virginia, et al.

- Proven ability to provide regulatory support for filings.

- Innovative approaches to maximize the EM&V work effort while reducing redundant EM&V costs by moving to bi-annual impact evaluations of certain programs.

- Established connection with a local New Orleans contractor to handle field audits.

V.   NOLA Wise Schoolkits Program

A.   Details of National Theater for Children's Bid

National Theater for Children ("NTC") submitted a proposal to handle the Schoolkits Program for the Energy Smart programs for the time period, January 2023 – December 2025. The proposed Schoolkits Program represents a change to the current schoolkits program. The responsibilities of the Implementer include, but are not limited to:
- Developing and executing a Schoolkits program to help New Orleans students learn about energy efficiency and become more energy efficient;
- Provide students with energy efficiency kits and track the kWh associated with them;
- Deliver educational performances; and
- Providing regular reports on the progress of the program.

B.   Basis for Selection

NTC has implemented proven schoolkits programs in Texas, Arkansas, Oklahoma, Pennsylvania, North Carolina, South Carolina, and other parts of Louisiana.

Key Components of NTC's bid:

- Innovative program design that includes live theatrical performances.

- Proven record of successful programs

- Marketing campaign that includes email, direct mail, and social media campaigns

- Familiarity with local stakeholders.

VI.   Electric Vehicle Charger Demand Response Program

A.   Details of Sagewell's Bid

Sagewell submitted a proposal to implement an Electric Vehicle ("EV") Charger demand response Bring Your Own Charger ("BYOC") pilot program for the Energy Smart program for the time period, January 2023 – December 2025. The proposed BYOC program's purpose will be to incentivize electric vehicle owners to charge their vehicles at off-peak times. The responsibilities of the Implementer include, but are not limited to:

- Developing and executing a program to help incentivize New Orleans residents charge their electric vehicles at off-peak times;
- Recruit and compensate program participants; and
- Providing regular reports on the progress of the program;

B. Basis for Selection

Sagewell has implemented award-winning BYOC programs for Consumers Energy, Jacksonville Electric Authority (JEA), DTE Energy Co., and others.

Key Components of Sagewell's bid:

- Demonstrated ability to implement turnkey EV Charging DR programs.

- Proven record of successful programs having been evaluated by a third party evaluator.

- Ability to utilize AMI data or telematics to monitor compliance

- Proven relationship with Original Equipment Manufacturers (OEMs)

- Proprietary disaggregation algorithms to help identify EV charging customers

- Proven ability to enroll participants quickly

VII. Large Commercial Automated Demand Response Program

A. Details of Honeywell's Bid

Honeywell submitted a proposal to implement a large commercial automated demand response ("ADR") program for the Energy Smart program for the time period, January 2023 – December 2025. The proposed ADR program's purpose will be to incentivize large commercial customers to reduce their demand during peak times. The responsibilities of the implementer include, but are not limited to:

- Developing and executing a program to help incentivize large commercial customers to reduce their usage during peak times;
- Recruit and compensate program participants; and
- Providing regular reports on the progress of the program;

B. Basis for Selection

As current program implementer, Honeywell continues to grow the ADR program despite setbacks associated with COVID restrictions and Hurricane Ida. Honeywell has implemented successful programs internationally and in the United States including Connecticut, Virginia and North Carolina.

Key Components of Honeywell's bid:

- Demonstrated ability to implement turnkey ADR programs around the world.

- Proven record of successful programs having been evaluated by a third party evaluator.

- Proven partnership with Generac which provides the state of the art Concerto platform that will be used to run events. Generac brings nearly two decades of professional services and grid-balancing software solution experience brought over from acquisition of Enbala Power Networks.

- Sitetracker for the tracking and reporting of all program activities and results from the C&I ADR program. Sitetracker is a flexible software solution that can support a wide variety of program types by tracking activities across the full lifecycle of program participation.

- Plan to acquire approximately new 5.9MW over the next three program years.

VI. Conclusion

ENO has evaluated the responses to the RFP based on the criteria established and set forth in the RFP to determine the most cost-effective and qualified respondents, as directed by Council Resolution. Consistent with these requirements, ENO has selected Aptim, NTC, Sagewell, and Honeywell to serve as TPAs and ADM to serve as the TPE. Accordingly, ENO respectfully requests that the Council assent to the selections of APTIM, NTC, Sagewell, Honeywell and ADM.