

2025 Evaluation, Measurement, and Verification Plan

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1 Introduction

Evaluation, Measurement, and Verification (EM&V) is an integral and required part of Rhode Island Energy's energy efficiency program planning process. EM&V provides independent verification of impacts to ensure that savings and benefits claimed by the Company through its energy efficiency programs are accurate and credible. EM&V also provides insight into market characteristics and guidance on energy efficiency program design to improve the delivery of cost-effective programs.

The Company's EM&V Plan continues to focus on evaluating Rhode Island projects, markets, and energy efficiency programs while leveraging as many resources as possible from evaluation studies in other jurisdictions to maximize value for ratepayers while minimizing costs. These studies are commissioned by the Company. They are conducted by independent evaluation firms, whose goal is to produce an accurate, complete, and transparent review of Rhode Island's energy efficiency programs and markets. The types of evaluation may include (but not limited to) the following:

- **Impact Evaluations:** Comparisons of claimed savings against actual realized savings using methods such as literature review, billing analyses, engineering methods and onsite data logging as a means of verification.
- **Process Evaluations:** Broad examinations of existing practices, such as program delivery methods, for the purpose of gathering information to draw conclusions about effectiveness of existing processes, highlight best practices, and offer suggestions for future improvements.
- **Market Assessment Studies:** Broad studies aimed at assessing changes in market conditions, such as evolving adoption rates of current energy efficiency technologies.
- **Net-to-Gross Evaluations:** Studies aimed at quantifying the rate of free-ridership and spillover associated with energy efficiency participants and non-participants.

The free-ridership rate is the percentage of savings attributable to participants who would have installed the measures in the absence of program intervention while spillover includes the effects of two components:

1. Participants in the program who install additional energy efficient measures outside of the program as a result of participating in the program, and
2. Non-participants who install energy efficient measures as a result of being aware of the program

The study methodologies and savings assumptions from evaluation studies are documented in the Rhode Island Technical Reference Manual (TRM). The TRM is reviewed and updated annually to reflect changes in technology, baselines, and evaluation results.

The entire evaluation process is managed by the Company in consultation with the Rhode Island Energy Efficiency & Resource Management Council (EERMC) and the Office of Energy Resources (OER). The EERMC and OER follow each study closely and are involved in planning, work plan development, and review of interim work products and study results.

Business Use

The Company's EM&V framework provides confidence among ratepayers and stakeholders that programs are effective and EM&V activities are independent and objective.

2 Evaluation Studies Applicable to 2025

2.1 Overview

The Company, with input from EERMC and OER, expects to complete ~~fifteenth~~^{thirteen} Rhode Island-specific evaluation studies in 2024 that will be applied beginning in 2025 (see Section 2.2 below).¹ The research studies include impact evaluations, process evaluations, and market studies in the residential and commercial and industrial (C&I) sectors, as well as studies that are considered cross-cutting.

A complete list of historical research studies is provided in Section 4 along with a brief summary of the impact of those results in planning the Company's programs. Most of these studies are posted on the EERMC website.² Prior year studies that have been superseded by studies completed since the filing of the 2024 Energy Efficiency Plan have been removed from this list.

Section 5 provides detailed descriptions, findings, and recommendations of each of the Rhode Island-specific studies listed in the next section. In addition, selected research studies completed in other regions and/or other jurisdictions, most commonly Massachusetts,³ are periodically reviewed for applicability to Rhode Island due to similarity with RI Energy's programs, either in the measures offered, or program structure or delivery. In some instances, the results of these other evaluations have been judged by the Company, in consultation with EERMC and OER, to be applicable to Rhode Island's Energy's efficiency programs. The Company is adopting the results of these studies in 2025 program planning due to similarity, either in the measures offered, or program structure or delivery. No such evaluation study results are being adopted in 2025 program planning.

2.2 Recent Rhode Island-Specific studies

Commercial

- [C&I New Construction Baseline Study \(RI-22-CX-Codes\)](#)
- [C&I Free-Ridership and Spillover Study \(RI-23-CX-FRSO\)](#)
- [Impact Evaluation of PY2022 Custom Gas Installations \(RI-23-CG-CustGasPY22\)](#)
- [Impact Evaluation of PY2022 Custom Electric Installations \(RI-23-CE-CustElecPY22\)](#)
- [Process Evaluation of C&I New Construction Program \(RI-24-CX-CINCPProcess\)](#)
- [Commercial and Industrial Market Research \(RI-24-CX-MarketResearch\)](#)
- [Process Evaluation of C&I Custom Approach \(RI-24-CX-CustProcessEval\)](#)

1 Quantitative studies expected to be completed after approximately August 15, 2024, will not be used in program planning

² <https://rieermc.ri.gov/resources/> <https://eec.ri.gov/data-and-publications/> then scroll to "EM&VProgram Evaluation Studies."

³ Prior to May 2022, Narragansett Electric Company was part of National Grid, which has affiliates in Massachusetts, and which facilitated the leveraging of evaluation studies.

Commented [RIE1]: To be updated in subsequent drafts

Commented [RIE1R2]: Updated

Commented [RIE2]: Currently under review

Commented [RIE2R2]: Updated

Commented [RIE3]: LIST HERE STUDIES COMPLETED SINCE 2024 PLAN

ALSO Studies expected to be completed by end of 2024

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- ~~Impact Evaluation of PY2023 Custom Gas Installations (RI-24-CG-CustGasPY23)~~
- ~~Impact Evaluation of PY2023 Custom Electric Installations (RI-24-CE-CustElecPY23)~~
- ~~Market Characterization and Impact Evaluation of C&I Lighting Controls (RI-24-CE-Lighting)~~
- ~~Small Business Process Evaluation (RI-22-CX-Proc)~~
- ~~C&I New Construction Baseline Study (RI-22-CX-Codes)~~
- ~~Automated RTU Optimization Demonstration Evaluation (RI-22-CX-RTUOpt)~~
- ~~Impact Evaluation of PY2021 Custom Gas Installations (RI-22-CG-CustGasPY21)~~
- ~~Impact Evaluation of PY2021 Custom Electric Installations (RI-22-CE-CustElecPY21)~~
- ~~C&I Free Ridership and Spillover Study (RI-23-CX-FRISO)~~
- ~~Commercial Cooking Gas and Electric Impact Evaluation (RI-23-CX-CommCook)~~

Residential and Income-Eligible

- ~~RI-24-RX-IncEligible—Income Eligible Single Family Impact Evaluation (RI-24-RX-IncEligible)~~
- ~~Nonparticipant Characterization and Segmentation Research (RI-23-RX-NPSegmentation)~~
- ~~Residential Market Research (RI-24-RX-MarketResearch)~~
- ~~Participation Study Dashboard Update (RI-23-RX-Dashboard)~~
- ~~EnergyWise PY 2021 Impact Evaluation Study (RI-23-RX-EWisePY21)~~

Cross-cutting

- ~~Comprehensive Measure Life Review, Phase II (RI-243-XX-MeasureLife2Lifetime)~~
- ~~Multifamily Custom Measure Impact Evaluation (RI-24-XX-MultiFamCustom)~~

2.3 Recent Studies Adopted from Other Jurisdictions

The company will not be adopting any studies from other jurisdictions at this time.

Commercial

- ~~Non-Residential Technical Reference Manual Review (MA22C01-B TRM-Review)~~
- ~~Steam Traps and Boiler Efficiency Research – Phase II (MA20C02-G-ST)~~
- ~~ISP Recommendations: Ultra-Low Temperature Freezers (MA23C02-B-ISPREPOS)~~
- ~~Massachusetts Impact Shape Update~~

Residential

- ~~Massachusetts Residential Building Use and Equipment Characterization Study, Phase 7~~
- ~~Residential Heat Pumps NEIs Study (MA21X21-E-RHPNEI)~~

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3 2025 Planned Evaluation Studies

3.1 Overview

This section describes planned studies that focus on areas of interest to the Rhode Island Energy energy efficiency programs and build on the deep history of evaluation studies commissioned by the Company over numerous years. To optimize the use of evaluation resources, where programs are considered to be similar in program delivery and population served with those offered in Massachusetts, the Company will consider avenues to participate in Massachusetts studies.⁴

3.2 Summary

Table 2 lists evaluation studies that the Company plans to conduct in 2025 to inform the 2026 Annual Plan and future planning cycles. Barring changes to the 2025 Annual Plan schedule, studies that will be incorporated into the Annual Plan must be completed by August 2024. The proposed budget for evaluation study expenditures in 2025 is approximately \$2.7 million (\$2.21 million for electric and \$0.65 million for gas), including staffing costs. The proposed budget for EM&V comprises approximately 2.34% of the total portfolio budget in 2025.

Study labeling codes take the general form shown in Table 1. For example, RI-17-CG-CustGas refers to the Custom Gas Evaluation Study that started in 2017 in the commercial sector for gas, while RI-18-RX-IESF refers to evaluation study started in 2018 of the income eligible single-family program for electric and gas.

Table 1. Study Labeling Code Format

[State]	–	[Year Study Conducted]	–	[Sector]	[Fuel]	–	[Keyword]
RI		212 232 243		R = residential C = commercial X = cross sector	E = electric G = gas X = electric & gas		

Table 2. Planned Evaluation Studies in 2025

Sector	Study Code	Type	Affected Programs	Study Name
C&I	RI-24-CE-Lighting	Impact	C&I Elec	Market Characterization and Impact Evaluation of C&I Lighting Controls (ongoing)
C&I	RI-24-CG-CustGasPY23	Impact	C&I Gas	Impact Evaluation of Custom Gas

⁴ Despite no longer being part of National Grid, the Company plans to stay abreast of Massachusetts evaluation activities that may be beneficial and applicable in Rhode Island and follow through as appropriate.

Commented [AC4]: Initial Recommendations for 2025 Evaluation Studies (in addition to annual studies such as Custom Impact Evaluations)

- 1.Existing Building Commissioning Process Evaluation
- 2.Monitoring-Based Commissioning Process Evaluation – quick evaluation focused on customer feedback to get initial input on how to improve the MBCx offering.
- 3.Residential Appliance Saturation Study (RASS)
- 4.Heat-Pump Savings Evaluation
- 5.Residential & Income-Eligible QA/QC Process Evaluation - Talk with program managers to discuss data tracking and reporting QA/QC, then compare to best practice. Depending on the state, there is little transparency into how QA/QC works. What does RIE do when contractors are not performing up to par? Are there procedures to remediate performance or remove contractors? General lack of transparency here in RI – this applies to all sectors.
- 6.EnergyWise and Income-Eligible Multifamily Impact Evaluation (Prescriptive-focus)
- 7.Updates to 2021 Net-to-Gross Studies
- 8.Updates to RI Electric Load Shapes (using updated MA Data)

Commented [RIE4R2]: Discussed with C-team on 7/31

Commented [RIE5]: To be updated. For now, RIE assumes that the evaluation budget will be level with the 2024 budget

Commented [RIE5R2]: This is the case for budget associated with evaluation plan in 8/5 draft

Commented [RIE5R3]: Updated

				Installations (ongoing)
C&I	RI-24-CE-CustElecPY23	Impact	C&I Elec	Impact Evaluation of Custom Electric Installations (ongoing)
C&I	RI-25-CX-ISPRResearch	Impact	C&I	Commercial and Industrial Industry Standard Practice Research
C&I	RI-25-CE- CommLighting	Impact	C&I Elec	Commercial and Industrial Lighting
C&I	RI-25-CX- ExistCommissioning	Process	C&I	Existing Building Commissioning Process Evaluation
C&I	RI-25-CE- CIHeatPumps	Process/Market	C&I Elec	Research for C&I Heat Pumps
Residential	RI-25-RX- MarketResearch	Market	Residential	Residential Market Research
Residential	RI-25-RX-RASS	Market	Residential	Residential Appliance Saturation SurveyStudy
Residential	RI-25-RE-Products	Impact/ Market	Residential Electric	Residential Products Impact and Market Effects Evaluation
Residential	RI-25-RE- HeatPumpApp	Impact	Residential	Heat Pump Study Review and Application
Residential	RI-25-RX-MFPresc	Impact	Residential	EnergyWise and Income-Eligible Multifamily Impact Evaluation
Residential	RI-25-RX-ResQAQC	Process	Residential	Residential & Income-Eligible QA/QC Process Evaluation
Cross-Cutting	RI-25-XX-TMYx	Impact	All	TMY3 to TMYx Savings Review and Adjustments

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The evaluation pathway for pilots, demonstrations, and assessments is based on each effort's scale, budget, scope, and the availability of external data. The Company's EM&V team will provide guidance beginning at the Plan stage for all pilots, demonstrations, and assessments to ensure design and data collection are suitable to allow for effective evaluation. In cases where an independent evaluation is appropriate, the EM&V team will run the evaluation. For guidelines on the stakeholder review process and which pilots, demonstrations, and assessments will receive an independent evaluation, please see

Attachment 8. The evaluation will follow the same established evaluation framework used in evaluations of established programs. This includes management of the independent evaluation vendor by the Company's EM&V team in consultation with the EERMC and OER. See Attachment 8 for further details on pilots, demonstrations, and assessments.

The EM&V team will follow the Company's standard procurement policy that cuts across programs in order to achieve the lowest cost procurement of required external services while enabling the Company to minimize administrative costs, deliver on program commitments, and meet time-sensitive regulatory deadlines. The Company's standard procurement policy is supported and enforced by a stand-alone internal procurement function. Contract characteristics below certain thresholds are eligible for sole sourcing while contract characteristics above thresholds require competitive procurement - unless it can be demonstrated to the procurement organization that securing multiple bids is not possible or practical.

Final reports along with graphical executive summaries will be made publicly available upon completion of the evaluation studies. All complete graphical executive summaries will be provided as a handout at EERMC meetings and posted on the EERMC website.⁵

3.3 Commercial and Industrial Planned Studies

RI-234-CG-CustGasPY223 - Impact Evaluation of PY2023 Custom Gas Installations (Continuing)

The objective of this impact evaluation is to provide verification of natural gas energy savings estimates for a sample of custom gas projects through site-specific inspection, metering, and analysis. The results of this study will be used to determine the realization rates for custom gas energy efficiency offerings based on installations from 20223. This will continue 'rolling' evaluation efforts, where each year will evaluate roughly 1/3 of the number of sites needed for a full sample and results will be combined with results from the previous two years, which will keep the realization rates updated yearly. This study began in summer 20234 and will continue into 20254 at which time a new cohort from 20234 will be studied.

RI-234-CE-CustElecPY223 – Impact Evaluation of PY2023 Custom Electric Installations (Continuing)

The objective of this impact evaluation is to provide verification of electric energy savings estimates for a sample of non-lighting custom electric projects through site-specific inspection, metering, and analysis. The results of this study will be used to determine the realization rates for custom electric energy efficiency offerings based on installations from 20223. This will continue 'rolling' evaluation efforts, where each year will evaluate roughly 1/3 of the number of sites needed for a full sample and results will be combined with results from the previous two years, which will keep the realization rates updated

⁵ <https://rieermc.ri.gov/plans-reports/evaluation-studies/> <https://eec.ri.gov/data-and-publications/> scroll down to EM&V Studies

yearly. This study began in summer 2023⁴ and will continue into 2024⁵ at which time a new cohort from 2023⁴ will be studied.

RI-24-CE-Lighting - Impact Evaluation of C&I Lighting Controls (Continuing)

Lighting efficiency continues to be a significant contributor to savings in the C&I Electric portfolio, and it has been five years or more since C&I lighting was studied in an impact evaluation. This study focuses on lighting controls, which will continue to be an important part of the C&I portfolio even as incentives for luminaires ~~is~~^{are} phased out.

RI-24⁵-CX-ISPResearch - Commercial and Industrial Industry Standard Practice Research

The objective of this study is to better understand what the baseline or industry standard practice (ISP) is for certain technologies. There are ~~two~~^{a few} potential areas of investigation: One area is air compressors, where many projects use load/no load as the baseline but VFD (variable frequency drive) compressors are ever more common and could be standard practice. There may be an opportunity to study compressor ISP jointly with Massachusetts. The second potential area is a cannabis grow facility ISP study, particularly with regards to horticulture lighting. This is an emerging area in the state with great potential for efficiency. However, since it is emerging, there are varying views about what baseline practices are. These questions could be resolved with an ISP study. Other areas under consideration are variable frequency drives and changes related to adoption of the IECC 2024 building code. The Company will determine the specific area for investigation in late 2024³ or early 2025.

RI-25-CE-CommLighting - Commercial and Industrial Lighting

This study would be a ~~low-~~ to medium-rigor evaluation to look at lighting impacts. Even while lighting savings are diminishing, they still make up a significant portion of the Company's resource portfolio in ISO-New England's Forward Capacity Market. ISO-New England M&V guidelines express a preference for studies that are less than five years old. While ISO-NE allows justification for the use of older studies, the Company believes it would be preferable to update the lighting impacts.

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RI-25-CX-ExistCommissioning - Existing Building Commissioning Process Evaluation

The Company has been offering incentives for retrocommissioning of existing buildings for several years but has not seen a large amount of participation. It has also not been the focus of an evaluation study. This process evaluation would examine participation trends and barriers and identify areas to increase participation.

RI-25-CE-CIHeatPumps - Research for C&I Heat Pumps

The Company would focus this research on assessing the C&I Small Business Market to prepare for electric resistance heat to heat pump conversions. It may focus on assessing the size of the market,

identifying successful implementation efforts from other jurisdictions and creating modeling algorithms and tools to help predict savings for customers.

3.4 Residential and Income-Eligible Planned Studies

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RI-245-RX-MarketResearch – Residential Market Research

There are several areas of potential interest for additional market research to support delivery of Residential energy efficiency programs. The focus would be to identify opportunities for the RI team to improve program design and delivery to be inclusive of all customers, and also investigate the opportunities for leveraging outside funding for particular programs or measures. Research related to electrification will be carefully considered to make sure it is consistent with the Company's energy efficiency implementation efforts. The Company will determine the specific area for investigation in late 2023~~4~~ or early 2025.

RI-25-RX-RASS – Residential Appliance Saturation SurveyStudy

An appliance saturation survey is the means by which the Company can learn about the penetration of certain types of equipment in customers' dwellings. The last time such a study was done in Rhode Island was 2018. Updating this information, particularly as the focus of the residential programs has moved away from efficient lighting, will provide valuable insights on emerging opportunities. The study would focus primarily on emerging measures and rely on a combination of virtual self-audit tools and a more limited number of onsite verification visits to balance study cost with the reliability of the resulting data.

RI-25-RE-Products – Residential Products Impact and Market Effects Evaluation

This study would focus on non-lighting / non-refrigeration recycling measures in the Residential Producets programs, which have not been the subject of an impact evaluation study for several years. These measures contribute a non-negligible amount of savings to the electric portfolio and there are sufficient non-lighting and non-refrigeration recycling savings to justify a study. The study would include a component to determine free-ridership and spillover rates for the covered measures.

Commented [GR7]: non-appliance recycling?

When have we recently looked at refrigerators and freezers?

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RI-25-RX-MFPresc – EnergyWise and Income-Eligible Multifamily Impact Evaluation

This study would evaluate the performance of prescriptive measures, in both the EnergyWise and Income Eligible Multifamily programs; these were last studied in 2019.

RI-25-RX-HeatPumps – Heat Pump Study Review and Application

This study is to obtain Rhode Island-specific useful information from the recently completed Massachusetts and Connecticut study. The MA/CT study covered many different types of baseline configurations and installations. The effort proposed here would be to work with that study's evaluator to leverage and analyze a subset of data for application to Rhode Island Energy's program offerings.

RI-25-RX-ResQAQC – Residential & Income-Eligible QA/QC Process Evaluation

The objective of this study is to understand the effectiveness of implementation QA/QC processes. Among other things, field-based QA/QC affects customer acceptance of energy efficiency, customer satisfaction, savings, and savings persistence. As a first step in this study, the independent evaluator will map out external QA/QC processes for residential programs and compliance with them; then determine if fuller investigation is warranted.

3.43.5 Cross-sector or Other Planned Studies

RI-25-XX-TMYx - TMY3 to TMYx Savings Review and Adjustments

Typical Meteorological Year (TMY) data that is the basis for the calculation of savings for many weather-sensitive measures has been updated. A new data set, TMYx, has been created, updating the prior data set, TMY3, which is about 20 years old. The new data set reflects the warmer climate. This study will review savings calculations in the Rhode Island TRM and identify those measures for which savings calculations may need to be updated. It will map out a process and timeline for updating the savings calculations and begin that process.

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4 Historic Evaluation Studies

This section contains a list of all historic studies still being used by the Company as the basis of claimed savings in the 2024 Program Plan and in the Technical Reference Manual. An at-a-glance summary in [Table 3](#) shows the studies by program, followed by the more detailed [Table 4](#) summarizing the relevant studies. [These studies are available through the EERMC, the PUC, and Rhode Island Energy.](#)

Table 3. Historic Evaluation Studies

The Narragansett Electric Company
d/b/a/ Rhode Island Energy
Docket No. 24-XX-EE
2025 Annual Plan Attachment 3
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Sector	Study type	Program	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025 Plan
Residential	Impact	EnergyWise SF										
		Income Eligible SF										
		EnergyWise MF									Custom	Prescriptive
		Income Eligible MF									Custom	Prescriptive
		Home Energy Reports										
		EnergyStar Products										
	Impact/Market	HVAC						Demo	HP			
		Heat Pumps										
		EnergyStar Lighting										
	Impact/Process	Connected Solutions										
		EnergyWise SF										
		EnergyWise MF										
	Market	HVAC										
		All										
		EnergyWise SF										
	Process	Income Eligible SF										
		EnergyWise MF										
		Income Eligible MF										
Cross-cutting/Special	Impact/Market	Home Energy Reports										
		EnergyStar Products										
		HVAC										
	Benefits	Avoided Cost										
		Economic Impacts										
		Lifetime										
	Impact	C&I NEIs										
		Gas Peak Demand										
		C&I Cooking										
	Impact/Market	Workforce										
		ES Homes/Codes&Standards										
		Potential Study										
	Market	Participation										
		Non-Participant										
		RASS										
	Process	Heat Pumps Study										
		Legislated M&V Study										
		Free Ridership/Spillover										
C&I Electric	Value	Piggybacking Study										
		All										
		Custom										
	Impact	HVAC										
		Industrial Process										
		CAIR										
		Refridgeration, Motors, Other										
		Custom Lighting										
		Street Lighting										
		CDA										
		CHP										
		Prescriptive Lighting										
		Upstream Lighting										
		Lighting Controls										
		Prescriptive HVAC										
C&I Gas	Impact	Prescriptive VSD										
		Prescriptive CAIR										
		Connected Solutions										
	Market	All										
		NTG										
		Upstream Lighting										
	Process	All										
		Heat Pumps										
		Custom										
	Impact/Process/Market	Prescriptive										
		All										
		NTG										
Small Business	Process	All										
		Lighting										
		Non-Lighting Electric										
	Impact	Heat Pumps										
		All										
		NTG										
	Market	All										
		Lighting										
		Non-Lighting Electric										
	Process	Heat Pumps										
		All										
		NTG										
	Impact	All										
		Lighting										
		Non-Lighting Electric										

The Narragansett Electric Company
d/b/a/ Rhode Island Energy
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Sector	Study type	Program	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024 Plan
Residential	Impact	EnergyWise SF										
		Income Eligible SF										
		EnergyWise MF										
		Income Eligible MF										
		Home Energy Reports										
		EnergyStar Products										
		HVAC										
	Impact/Market	EnergyStar Lighting										
	Impact/Process	Connected Solutions										
	Market	EnergyWise SF										
		EnergyWise MF										
	Process	EnergyWise SF										
		Income Eligible SF										
		EnergyWise MF										
		Income Eligible MF										
Cross-cutting/Special	Benefits	Avoided Cost										
		Economic Impacts										
	Impact	Lifetime										
		C&I NEIs										
		Gas Peak Demand										
		C&I Cooking										
	Impact/Market	Workforce										
		ES Homes/Codes&Standards										
	Market	Potential Study										
		Participation										
		Non-Participant										
		RASS										
C&I Electric	Impact	Heat Pumps Study										
		Legislated M&V Study										
		Free Ridership/Spillover										
		Piggybacking Study										
		Value										
		Custom										
		HVAC										
		Industrial Process										
		CAIR										
		Refridgeration, Motors, Other										
		Custom Lighting										
		Street Lighting										
		CDA										
		CHP										
C&I Gas	Impact	Prescriptive Lighting										
		Upstream Lighting										
		Prescriptive HVAC										
		Prescriptive VSD										
		Prescriptive CAIR										
		Connected Solutions										
		All										
		All										
		NTG										
		Upstream Lighting										
		All										
		Custom										
		Prescriptive										
		All										
Small Business	Impact	Lighting										
		Non-Lighting Electric										
		All										
		All										

These studies are available through the EERMC, the PUC, and Rhode Island Energy.

Table 4. Completed Evaluation Studies Applicable in 2025

2024

Commented [RIE8]: To be updated

Commented [RIE8R2]: Updated

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Study	Impact Descriptions	Sector
Cadeo, Comprehensive Measure Life Review <u>II, August-September 2024</u> ³	The study reviewed prescriptive measure life assumptions and ensured they aligned with recent research, Rhode Island evaluation studies, and industry best practices. The study also recommended measure life updates when appropriate.	<u>All</u>
Illume, Electric Resistance Heat Characterization Study (Draft)	<u>The study identified the needs of homeowners and landlords with electric resistance heat and ways to overcome barriers heat pump adoption</u>	<u>Res</u>
DNV, Rhode Island Swarm Thermostats – Technology Evaluation Pilot, March, 2024	<u>The evaluation calculated the impacts of installing the Swarm Logic control technology at four sites equipped with HVAC units controlled by Wi-Fi thermostats.</u>	<u>C&I</u>
Synapse Energy Economics, Avoided Energy Supply Components in New England 2024 ⁴ -Report, May 2024 ¹ ; February, 2024	<u>The study developed new estimates of avoided costs associated with energy efficiency measures for program administrators throughout New England States. Rhode Island used the avoided costs of energy, capacity, natural gas, fuel oil, environmental costs and demand reduction induced price effects resulting from this study for 2024⁵ program planning.</u>	All
<u>Tetra Tech, 2022 Commercial and Industrial Programs Free-Ridership and Spillover Study, January 2024</u>	<u>The study updated free-ridership and spillover rates for the C&I program.</u>	<u>C&I</u>
DNV, Impact Evaluation of PY2022 ⁴ Custom Gas Installations, August 2023 ⁴	<u>The study updated realization rates for custom electric projects, as part of a rolling effort that incorporated results from PY2020, PY2021, and PY2022.</u>	C&I
DNV, Impact Evaluation of PY2022 ⁴ Custom Electric Installations, August 2024 ²³	The study updated realization rates for custom gas projects, as part of a rolling effort that incorporated results from PY20 ¹⁹ 20, PY202 ¹⁹ 19, and PY2022 ⁴ .	C&I
<u>DNV, ISP Recommendations: Ultra Low Temperature Freezers, September 2023 (Leveraged from MA)</u>	<u>The study investigated industry standard practice for ultra-low temperature freezers and updated the baseline from the results.</u>	<u>C&I</u>
<u>Cadeo, Non-Residential Technical Reference Manual Review, October 2022 (Leveraged from MA)</u>	<u>The study performed a comprehensive review of the non-residential prescriptive measures in the MA TRM and recommended updates for key parameters.</u>	<u>C&I</u>
<u>Steam Traps and Boiler Efficiency Research Phase II, November 2022 (Leveraged from MA)</u>	<u>The study conducted research of steam trap projects practices and boiler plant efficiency measurements to improve project accuracy.</u>	<u>C&I</u>
<u>Guidehouse, MA Residential Building Use</u>	<u>The study collected saturation, characterization, and usage behavior data for major appliances, HVAC</u>	<u>Res</u>

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and Equipment Characterization – Phase 7, December 2023 (Leveraged from MA)	equipment, and electronics in MA homes. The study updated residential load shapes based on the findings.	
DNV, MA Impact Shape Final, February 2024 (Leveraged from MA)	The study updated commercial loadshapes for end uses such as, refrigeration, compressed air, food service, water heating, etc.	C&I
NMR Group, Residential Heat Pump NEIs Study, July 2023 (Leveraged from MA)	The study updated NEIs for heat pump related measures.	Res
2023		
Study	Impact Descriptions	Sector
Cadeo & NMR, Residential New Construction and Code Compliance Study, May 2023	The study updated the User Design Reference Home baseline measure level efficiencies, observed how building practices have changed over time, and identified the level of code compliance.	Res
Cadeo, Comprehensive Measure Life Review, August 2023	The study reviewed prescriptive measure life assumptions and ensured they aligned with recent research, Rhode Island evaluation studies, and industry best practices. The study also recommended measure life updates when appropriate.	Cross-Cutting
Cadeo, EnergyWise Single Family Weatherization Impact Evaluation, August 2023 (Draft)	The study updated the gross energy savings for EWSF's weatherization measures, for both primary and secondary heating and cooling. The evaluation accounted for energy savings associated with natural gas, electricity and/or delivered fuels (oil, propane, and wood).	Res
DNV, Impact Evaluation of PY2021 Custom Gas Installations, August 2023	The study updated realization rates for custom gas projects, as part of a rolling effort that incorporated results from PY2019, PY2020, and PY2021.	C&I
DNV, Impact Evaluation of PY2021 Custom Electric Installations, August 2023	The study updated realization rates for custom electric projects, as part of a rolling effort that incorporated results from PY2019, PY2020, and PY2021.	C&I
DNV, Rhode Island Commercial Food Service Equipment ISP, August 2023	The study characterized industry standard practice in RI for commercial kitchen equipment by incorporating the 2023 appliance standards and prevalence of used equipment in the marketplace.	C&I
Cadeo, Small Business Program Process Evaluation, August 2023	The study assessed program activities and identified opportunities for program enhancement for the small business program.	C&I
BW Research Partnership, Rhode Island Energy	The study quantified the current energy efficiency workforce in RI, identified needs and opportunities for the future, highlighted workforce development gaps	Cross-Cutting

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Workforce Development, August 2023	and potential solutions, and identified potential roles for RI Energy in supporting energy efficiency workforce development in RI.	
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2022		
Study	Impact Descriptions	Sector
DNV, C&I Lighting Market Characterization and Adjusted Measure Life Study, August 2022	The study calculated adjusted measure lives for non-residential custom and prescriptive lighting measures for RI.	C&I
DNV, Impact Evaluation of PY2020 Custom Gas Installations, August 2022	The study updated realization rates for custom gas projects, as part of a rolling effort that incorporated results from PY2018, PY2019, and PY2020.	C&I
DNV, Impact Evaluation of PY2020 Custom Electric Installations, August 2022	The study updated realization rates for custom electric projects, as part of a rolling effort that incorporated results from PY2018, PY2019, and PY2020.	C&I
DNV, Rhode Island Cannabis Industry Standard Practice, August 2022	The study identified industry standard practices for the medical market cannabis industry with a focus on horticultural lighting, lighting controls, cultivation area HVAC, HVAC controls, and dehumidification.	Cross- Cutting
Cadeo, Nonparticipant Market Barriers Study, June 2022	The study characterized the customer groups not participating in Rhode Island Energy's energy efficiency programs, determined barriers to participation, and identified opportunities to engage nonparticipants.	Cross- Cutting
Cadeo, Participation and Multifamily Census Study, June 2022	The study identified trends and drivers in participation and the likelihood of nonparticipants opting into a residential program in the future. The study also developed an algorithm to identify multifamily buildings suitable for RIE's multifamily programs.	Cross- Cutting
Guidehouse, Rhode Island 2021 Energy Efficiency Workforce Analysis – Final Report, May 2022	This study quantified the workforce that was involved in delivering The Narragansett Electric Company's Rhode Island programs in 2021. The workforce analysis reported the number of jobs associated with the programs, compared them to past years, and provided narrative context for those findings and observations.	Cross-Cutting
DNV, O&M and Non-O&M NEI Study (MA20X10-B-CIOMNEI), October 2021	This study developed O&M and non-O&M non-energy impacts (NEIs) across all C&I measures and programs.	C&I
2021		
Study	Impact Descriptions	Sector

DNV, Impact Evaluation of PY2019 Upstream Lighting Program, July 2021	This study updated prospective realization rates and impact factors for the C&I Upstream lighting program. The values reflect decreasing ISR values for Screw-in products and increasing ISRs for linear products. These will be applicable for 2022, 2023, and beyond.	C&I
NMR, Appliance Recycling Impact Factor Update, June 2021	This study updated the gross kWh savings, realization rates and NTG factors for refrigerator and freezer recycling measures.	Res
DNV, Franchise Controls Deemed Savings Study, March 2021 (Leveraged study from MA)	This study recommended a deemed savings value of 5,344 kWh for a building automation system (BAS) measure that controls small individual food service appliances.	C&I
DNV, Upstream Lighting NTG, June 2021 (Leveraged study from MA)	This study updated NTG values for upstream lighting technologies and adjusted the values down significantly due to heavy free ridership.	C&I
DNV, Ground Source Heat Pump eTRM Measure Review, March 2021 (Leveraged study from MA)	This study recommended that GSHPs be broken out from ASHPs into their own category offering in order to allow the program to attribute savings, baselines, and lifetimes in a more defensible way. It also recommended the GSHP lifetime be updated to 25 years.	C&I
DNV, NRNC Market Characterization Study, June 2021 (Leveraged study from MA)	This study produced factors to be applied to IECC 2015-based code LPD to determine baseline LPD requirements.	C&I
DNV, Energy Management System ISP Study, 2021 (Leveraged study from MA)	This study identified industry standard practices for energy management systems, with a particular focus on criteria for determining when an existing system should be considered failed.	C&I
DNV, C&I HVAC NTG & Market Effects Measurement, 2021 (Leveraged study from MA)	This study established Net to Gross Ratios for six technologies supported by the Upstream HVAC Initiative.	C&I
Guidehouse, RCD Virtual Assessment Study, March 2021 (Leveraged study from MA)	This study found that in-service rates are lower for self-installed measures. Rhode Island leveraged results from this study to update the in-service rates for instant savings measures in the EnergyWise Single Family program.	Res
Guidehouse, Comprehensive TRM Review, April 2021 (Leveraged study from MA)	This study updated savings assumptions and effective useful lives (EUL) of several residential measures in MA. Rhode Island adopted the results from this study to update savings and EUL assumptions for several measures in the residential programs.	Res
NMR, Low Income Multifamily Health NEI (TXC 50), July 2021	This study produced NEI values associated with energy efficiency programs in Income Eligible, Multifamily buildings. A total of 4 health and safety NEIs were monetized as part of	Res

(Leveraged study from MA)	this study. Arthritis, Thermal Stress (cold), Home Productivity, and reduced fire risk were all found to have Annual Per unit values of \$49, \$1,426, \$49, and \$13, respectively, totaling \$1536. These values are allocated to all applicable air sealing, insulation, and heating measures.	
NMR, Residential New Construction Quick Hit NEI Study (MA20X14-RNCNEI), September 2021 (Leveraged study from MA)	The study produced updated NEI values for heating related measures offered through the Residential New Construction program. The total Heating NEIs for RNC went from an Annual Per Unit value of \$117 to \$142.33 due to increases in thermal comfort and noise reduction related impacts.	Res
NMR, Residential Downstream/Upstream Products Net-to-Gross Study, June 2021 (Leveraged study from MA)	This study yielded prospective net-to-gross ratios and retrospective and prospective in-service rates for products supported by the Residential Retail or Residential Coordinated Delivery Initiatives. Rhode Island adopted the results from this study to update 2022 planning assumptions for ENERGY STAR Products program.	Res
NMR, Low-rise Residential New Construction Net-to-Gross Study, July 2021 (Leveraged study from MA)	This study yielded prospective and retrospective net-to-gross ratios for measures supported by the Low Rise Residential New Construction offering. Rhode Island adopted the results from this study to update 2022 planning assumptions.	Res
NMR, Renovations and Additions Net-to-Gross Study, July 2021 (Leveraged study from MA)	This study yielded prospective and retrospective net-to-gross ratios for measures supported by the Renovations and Additions Residential New Construction offering. Rhode Island adopted the results from this study to update 2022 planning assumptions.	Res
Guidehouse, Impact Analysis of Residential Wi-Fi Thermostats, September 2021 (Leveraged study from MA)	This study updated savings assumptions for programmable and Wi-Fi thermostats delivered through retail and direct install channels. Rhode Island adopted the draft results from this study to update savings for programmable and Wi-Fi thermostat measures in the residential HVAC and retrofit programs.	Res
Net-to-Gross Research of RCD and Select Products Measures (MA20R28)	For RI, the study applied new NTG results for the residential gas and electric HVAC programs.	Res
Synapse Energy Economics, Avoided Energy Supply Components in New England 2021 Report, May 2021.	This study developed new estimates of avoided costs associated with energy efficiency measures for program administrators throughout New England States. Rhode Island used the avoided costs of energy, capacity, natural gas, fuel oil, environmental costs and demand reduction induced price effects resulting from this study for 2022 program planning.	All
2020		
Study	Impact Descriptions	Sector
Cadeo, Impact and Process Evaluation of	This study updated gross savings, in-service rates, and net-to-gross ratios for the EnergyWise Single Family program.	Res

EnergyWise Single Family Program, September 2020.		
Cadeo, Impact and Process Evaluation of EnergyWise Multi Family Program, September 2020.	This study updated gross savings, realization rates, in-service rates, and net-to-gross ratios for the EnergyWise Multi Family program.	Res
Cadeo, Impact and Process Evaluation of Income Eligible Multi Family Program, September 2020.	This study updated gross savings, realization rates and in-service rates for the Income-Eligible Multi Family program.	Res
Cadeo, Impact Evaluation of Home Energy Reports Program 2017-2019, September 2020.	This study updated realization rates for the Home Energy Reports program.	Res
NMR, Lighting Hours of Use Study, March 2020. (Leveraged study from MA)	This study reviewed and updated the HOU used to calculate the lighting savings measures in MA. Rhode Island adopted the results to update savings assumptions for the lighting measures in RI.	Res
DNV GL, Impact Evaluation of 2017 Small Business Electric Installations, March 2020.	The study updated electric non-lighting impact factors for the Small Business initiative. RI leveraged the MA study of this initiative.	C&I
DNV GL, C&I Measure Life Study, March 2020.	This study informed Effective Useful Lives and Remaining Useful Lives for key C&I energy efficiency measures, updating the commercial boiler EUL. RI leveraged the MA study of this initiative.	C&I
The Brattle Group, The Road to 100% Renewable Energy by 2030 in Rhode Island, December 2020.	This study provided a high-level economic analysis of the key factors that will guide RI to meet 100% of the state's electricity demand by 2030 through renewable generation and efficiency. The study updated economic impact multipliers to quantify the benefits of future EE programs in the Rhode Island economy.	All
2019		
Study	Impact Descriptions	Sector
NMR, RLPNC 17-3 Advanced Power Strip Metering Study (Revised). March 2019. (Leveraged study from MA)	This study yielded recommended gross electric savings and realization rates from advanced power strips offered through the Home Energy Services and upstream programs. Rhode Island adopted the result from this study to inform savings for Tier 1 and Tier 2 advanced power strips offered through its Retail Products program.	Res
Navigant, Wi-Fi Thermostat Impact Evaluation Secondary	This study recommended annual savings values of 31 therms for combustion heating, 97 kWh for electric resistance heating, and 64 kWh for central air conditioning for Wi-Fi	Res

Research Study. September 2018. (Leveraged study from MA)	thermostats. Rhode Island adopted these results to update savings assumptions for Wi-Fi thermostats in HVAC and residential retrofit programs.	
2018		
Study	Impact Descriptions	Sector
Energy & Resource Solutions, Two-Tier Steam Trap Savings Study, April 2018.	This MA study recommends a two-tier approach for prescriptive steam traps. It calculates deemed savings to be 8.4 MMBtu/yr. for system operating pressure ≤15 psig, and 35.6 MMBtu/yr. for system operating pressure is >15 psig.	C&I
DNV GL, Impact Evaluation of PY 2015 Rhode Island Commercial and Industrial Upstream Lighting Initiative. September 2018.	The study updated impact factors for the Upstream Lighting initiative. The RI study leveraged the MA study of the same initiative.	C&I
DNV GL, Rhode Island Commercial & Industrial Impact Evaluation of 2013-2015 Custom Comprehensive Design Approach. October 2018.	The study updated the realization rate for the CDA initiative. The RI study leveraged the MA study of the same initiative.	C&I
DNV GL, Impact Evaluation of PY2016 RI C&I Small Business Initiative: Phase I. June 2019.	The study updated impact factors for the Small Business initiative. The RI study leveraged the MA study of the same initiative.	C&I
DNV GL, Prescriptive C&I Loadshapes of Savings. March 2018.	This MA study pooled known sources of 8,760 savings loadshapes in an interactive tool to estimate general prescriptive measure loadshapes over customizable time periods.	C&I
NMR, Rhode Island Residential Appliance Saturation Survey. October 2018	This study developed an inventory of residential end-uses, including appliances, consumer electronics, heating and cooling equipment, thermostats, water heating, and building characteristics. Findings from this study will be used to inform program planning and support future potential studies in Rhode Island.	Res
Cadeo, Rhode Island Impact Evaluation of Income Eligible Services Single Family Program, August 2018	This study produced deemed savings values and realization rates for electric and gas participants using billing and engineering analysis. The Company adopted the deemed savings values in the 2019 program plan.	Res
Navigant, MA Residential Electric Loadshape and Baseline Study (Heating and Cooling Season report). July 2018.	This study collected saturation, penetration, and usage behavior data for all major electric and gas appliances in Massachusetts. Rhode Island adopted the end use load shapes determined by this study.	Res

(Leveraged study from MA)		
NMR/DNV GL, TXC29 Market-Rate Rental Property NEI Study (Phase 1), March 2018	This study identified and analyzed NEIs associated with market-rate multifamily properties.	Res
2017		
Study	Impact Descriptions	Sector
ICF, 2017 Rhode Island Residential Code Savings Analysis	This study found that the average Rhode Island home could attain annual electric savings of 3,690 kWh and gas savings of 10 MMBtu if it fully complied with the state's building energy code.	Res
NMR, 2017 Rhode Island Code Compliance Enhancement Initiative Attribution and Savings Study	The study found residential and commercial attribution factors of 23% and 46%, respectively, which were used along with study results on average savings as well as construction activity projections to calculate the CCEI's projected savings from 2018-2020.	C&I
DNV-GL, MA C&I Steam Trap Evaluation Phase 2, Feb, 2017	This study updated steam trap savings estimates.	C&I
DNV-GL, Gas Boiler Market Characterization Study Phase II: Final Report, March 2017	This study updated C&I condensing boiler savings estimates.	C&I
DNV-GL, MA45 Prescriptive Programmable Thermostats, March 2017	This study updated programmable thermostat deemed gas savings for C&I programs.	C&I
2016		
Study	Impact Descriptions	Sector
DNV-GL, Impact Evaluation of 2014 RI Prescriptive Compressed Air Installations Final Report, July 2016	This study yielded an energy realization rate for prescriptive compressed air compressors, dryers, and EE accessories.	C&I
DNV-GL, Impact Evaluation of 2012 National Grid-Rhode Island Prescriptive Chiller Program Final Report, July 2016	This study yielded an energy realization rate for prescriptive chillers.	C&I
Cadmus Group; Large Commercial and Industrial On-Bill Repayment Program Evaluation, September, 2016	National Grid commissioned this study to evaluate the financing component of the large commercial and industrial (LCI) energy efficiency program. Cadmus evaluated the program design, performance, and sustainability; the overall market for the program; and the program's penetration of that market to date.	C&I

DNV GL, Stage 2 Results—Commercial and Industrial New Construction Non-Energy Impacts Study—Final Report, prepared for the Massachusetts Program Administrators, March 2016	The purpose of this study was to quantify the dollar value of participant NEIs for C&I NC projects completed in 2013, and to estimate gross NEIs per unit of energy savings resulting from NC electric and gas measures separately.	C&I
2015		
Study	Impact Descriptions	Sector
DNV-GL, Massachusetts 2013 Prescriptive Gas Impact Evaluation; Steam Trap Evaluation Phase 1, March 2015	The study concluded that there should continue to be both prescriptive and custom pathways for steam trap retrofit incentives, and further recommended that a group convene to review and revise the deemed savings estimate for steam traps. The study also recommended the use of a six-year lifetime for steam traps.	C&I
2014		
Study	Impact Descriptions	Sector
DNV GL, 2014, Impact Evaluation of National Grid Rhode Island C&I Prescriptive Gas Pre-Rinse Spray Valve Measure	The evaluation examined the gas and water savings associated with the installation of reduced-flow pre-rinse spray valves. The results are based on site measurements from MA and RI facilities. The final gross gas and water savings are 11.4 MMBtu and 6,410 gallons per spray valve respectively.	C&I
2012		
Study	Impact Descriptions	Sector
TetraTech, Final Report – Commercial and Industrial Non-Energy Impacts Study, (prepared for Massachusetts Program Administrators), June 29, 2012	This report provides a comprehensive set of statistically reliable non-energy impact (NEI) estimates across the range of C&I prescriptive and custom retrofit programs offered by the MA electric and gas Program Administrators (PAs). The analytical methods used allow this report’s findings to be applicable to RI.	C&I
2011		
Study	Impact Descriptions	Sector
KEMA, Inc., C&I Unitary HVAC Loadshape Project Final Report, Prepared for the Regional Evaluation, Measurement, and Verification Forum, June 2011.	This study produced updated diversity and equivalent full load hours for unitary HVAC measures using end use metering.	C&I
NMR/TetraTech, MA Special and Cross Sectors	This study quantified NEIs that apply to residential and low-income programs.	Res

Studies Area, Residential and Low-Income NEI Evaluation, August 2011		
2010		
Study	Impact Descriptions	Sector
ADM Associates, Inc., Residential Central AC Regional Evaluation, Final Report, October 2009	kWh and kW savings figures for the installation of efficient residential CAC systems.	Res

5 2024 Evaluation Study Findings

5.1 Rhode Island-Specific studies

RI-23-CX-FRSO – 2022 Commercial and Industrial Programs Free-Ridership and Spillover Study

Type of Study: Impact Evaluation

Conducted by: Tetra Tech

Date Evaluation Conducted: January 2024

Evaluation Objective and High-Level Findings:

The primary objective of this study was to quantify the net impacts of Rhode Island Energy's 2022 commercial and industrial electric and natural gas upstream and downstream energy efficiency programs. The study conducted surveys with a sample of 2022 program participants, market actors, and distributors within the gas and electric commercial and industrial programs to determine the free-rider and spillover participants.

The following table presents the results of the study: Table X. C&I Free-Ridership and Spillover Results Summary

Program Type and Delivery	Free-Ridership	Participant Spillover	Non-Participant Spillover	Net to Gross Ratio
Large C&I Upstream Prescriptive Measures	32.9%	7.7%	0.0%	74.8%
Large C&I Downstream Prescriptive Measures	17.4%	4.3%	2.6%	89.6%
Large C&I Custom Measures	18.6%	7.5%	0.0%	88.9%
Small Business	19.9%	1.5%	1.0%	82.5%
Overall	24.4%	4.7%	0.7%	81.0%

Programs to which the Results of the Study Apply:

The results of this study are applicable to the C&I programs.

Evaluation Recommendations included in the Study:

The study recommends adopting the NTG ratios in Table X for the electric and gas C&I programs.

Explain Whether or Not Rhode Island Energy (RIE) Decided to Adopt Recommendations from the Study:

RI Energy is adopting the recommendations from this study.

Savings Impact: The adoption of the NTG ratios from the study will impact the net savings for the C&I programs.

Commented [RIE9]: Example from 2024 Plan, will be updated for recently completed studies and studies adopted from MA.

Commented [RIE9R2]: No updates for this draft.

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RI-23-CX-SwarmLogic Rhode Island Swarm Thermostats – Technology Evaluation Pilot

Type of Study: Impact

Evaluation Conducted by: DNV

Date Evaluation Conducted: March 2024

Evaluation Objective and High-Level Findings:

The study calculated the impacts of installing Swarm Logic control technology at four sites equipped with HVAC units controlled by Wi-Fi thermostats. The study modeled baseline and as-built technology scenarios to estimate the annual heating and cooling impact by Swarm Logic technology.

The study found that Swarm Logic technology reduced energy consumption by an average of 5.9% during the cooling season and 13.2% during the heating season. One site had large heating savings and removing this site reduces the average heating savings to 4.2%. The heating savings were not directly metered like the cooling energy. The Swarm Logic technology reduced operating hours during moderate outdoor air temperatures, but the technology's impact diminishes in extreme cold or hot weather.

Programs to which the Results of the Study Apply:

The results of the study are applicable to the Small Business Direct Install and Large C&I Retrofit programs.

Evaluation Recommendations included in the Study:

The study did not have any recommendations.

Explain Whether or Not Rhode Island Energy (RI Energy) Decided to Adopt Recommendations from the Study:

The study determined the estimated savings from Swarm Logic technology. Based on the results, RI Energy is adopting the Swarm Logic technology as a measure offering in 2025 in the Small Business Direct Install and Large C&I Retrofit programs.

Savings Impact:

There are no savings impacts from this study.

RI 24-RE-ElecResHeatCharacterization—Electric Resistance Heat Characterization Study

Type of Study: Market

Evaluation Conducted by: Illume

Date Evaluation Conducted: Draft

Evaluation Objective and High Level Findings:

The primary objective of this study was to help RI Energy better understand the needs of homeowners and landlords with electric resistance heating (ERH) and ways to overcome barriers to heat pump adoption.

The study found that ERH customers are mostly satisfied with their heating systems and are often driven by a desire to be energy efficient and nearly half would explore additional RI Energy resources if they could receive more energy-efficient equipment. ERH users are hesitant to commit to heat pumps due to worries about installation costs and future electric bills. Landlords

Programs to which the Results of the Study Apply:

The results of the study are applicable to the Residential HVAC Program.

Evaluation Recommendations included in the Study:

The study recommends the following to encourage the switch from electric baseboard resistance heating to heat pump adoption:

- In marketing materials, emphasize how heat pumps align with ERH users' desire for energy-efficient heating systems.
- Promote heat pumps as a cost and energy saving alternative to older ERH systems and explore ways to gather additional information about customers' heating system for more targeted marketing campaigns.
- Streamline the rebate application process and provide comprehensive information on the website.
- Improve the program website by providing additional information on heat pump savings to encourage more applications.

Explain Whether or Not Rhode Island Energy (RI Energy) Decided to Adopt Recommendations from the Study:

RI Energy will consider the recommendations from the study in future program implementation.

Savings Impact:

There are no savings impacts from this study.

RI-23-CX-NRNCISP—Rhode Island Non-Residential New Construction Industry Standard Practice Study

Type of Study: ISP

Evaluation Conducted by: DNV

Date Evaluation Conducted: Draft

Evaluation Objective and High-Level Findings:

The primary objective of this study was to assess and inform Industry Standard Practices (ISPs) for RI Energy's Non-Residential New Construction programs. The study also assessed energy code compliance for select code measures and researched potential program redesign.

The study found that current standard practice is better than code for many of the measures reviewed in the study including interior LPD, exterior LPD, above-grade wall insulation, boilers, air conditioning, and heat pump heating. The study also found that heat pump cooling and warm air furnaces are often installed above code.

Programs to which the Results of the Study Apply:

The results of the study are applicable to the Large Commercial New Construction Program.

Evaluation Recommendations included in the Study:

The study recommends the adoption of ISP values for the equipment identified in Table X. The study also recommends focusing energy code training on targeting code provisions that are not readily compiled with and/or require proper installation to capture energy benefits. Other recommendations include considering targeted studies to further investigate building envelope practices and expanding RIE program participation database to include more detailed information about program participation.

Table X: Recommended ISP code adjustment factors

Equipment type	Recommended code adjustment factor
Above-grade wall insulation	1.14
Interior lighting	0.45
Exterior lighting	0.27
Hot water boilers	1.20
Heat pumps – heating	1.03
Air conditioning	1.05

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Explain Whether or Not Rhode Island Energy (RI Energy) Decided to Adopt Recommendations from the Study:

RI Energy will determine what recommendations to adopt once the study is complete.

Savings Impact:

The measures identified in Table X will have savings impacts once adopted.

5.2 Massachusetts Study Summaries

MA23C02-B-ISP/REPOS – ISP Recommendations: Ultra-Low Temperature Freezers

Type of Study: Impact

Evaluation Conducted by: DNV

Date Evaluation Conducted: September 2023

Evaluation Objective and High-Level Findings:

The primary objective of this study was to investigate the industry standard practice for the purchase of ultra-low temperature freezers. The ISP study found that the Energy Star ratings assumed a freezer operating at -75°C whereas the most common freezer operating temperature is -80°C. Thus, the savings should be adjusted to account for the most common freezer operating temperature.

Programs to which the Results of the Study Apply:

The results of this study are applicable to the Large C&I New Construction Ultra Low Temperature Freezer measure.

Evaluation Recommendations included in the Study:

The ISP study recommends updating the savings for the ultra low temperature freezer measure based on the different freezer temperatures that are the basis for the ISP and Energy Star performance. The ISP study also recommends that the minimum performance threshold for the ultra low temperature freezer measure to follow the new Energy Star threshold once it is finalized in 2024. Once that is updated, it is recommended to update the ISP baseline performance to the current Energy Star threshold of 0.55 kWh/day/ft³.

Explain Whether or Not Rhode Island Energy (RI Energy) Decided to Adopt Recommendations from the Study:

RI Energy is adopting the savings update for the Ultra Low Temperature Freezer measure. RI Energy will continue review the updated Energy Star standard once it is finalized and update the savings accordingly.^[1]

Savings Impact:

The measure savings for the Ultra Low Temperature Freezer will decrease by approximately 10%.

^[1] [ENERGY STAR Version 2.0 Laboratory Grade Refrigerators and Freezers Draft 2 Specification](#)

Commented [RE10]: Example from 2024 Plan, will be updated for recently completed studies and studies adopted from MA.

Commented [RIE10R2]: One study added, MA Heat Pump NEIs Study

MA22C01-B TRM-Review - Non-Residential Technical Reference Manual Review

Type of Study: Impact

Evaluation Conducted by: Cadeo

Date Evaluation Conducted: October 2022

Evaluation Objective and High-Level Findings:

The primary objective of this study was to perform a comprehensive review of the non-residential prescriptive measures in the Massachusetts Technical Reference Manual and to recommend updates for key measure parameters.

Programs to which the Results of the Study Apply:

The results of this study are applicable to measures in the Small Business Direct Install, Large C&I New Construction, and Large C&I Retrofit Programs.

Evaluation Recommendations included in the Study:

The study recommends updates to the savings and calculations for commercial and industrial measures related to HVAC, hot water, and lighting.

Explain Whether or Not Rhode Island Energy (RI Energy) Decided to Adopt Recommendations from the Study:

RI Energy is adopting the savings and/or calculation updates for the following measures:

- Combo Condensing Boiler/Water Heaters
- Pre-rinse spray valves
- Electric hot water spray valves
- Indirect water heater
- Boiler Reset Control
- Dual Enthalpy Economizer Control
- Fan control
- Performance Lighting
- Lighting controls

Savings Impact:

Depending on the measure, the savings will increase or decrease.

MA20C02-G-ST – Steam Traps and Boiler Efficiency Research Phase II

Type of Study: Impact/Process

Evaluation Conducted by: DNV

Date Evaluation Conducted: November 2022

Evaluation Objective and High-Level Findings:

The primary objective of this study was to conduct additional research of steam trap projects practices and boiler plant efficiency measurements to improve project accuracy.

Programs to which the Results of the Study Apply:

The results of this study are applicable to custom and prescriptive steam trap measures in the C&I programs.

Evaluation Recommendations included in the Study:

The study recommends using an adjusted measure life (AML) of 3 years and updating the net-to-gross ratio to 1.0 for the steam trap measures. The study recommends using the updated steam trap tool from the study. RI Energy is currently in the process of getting the updated steam trap tool. If RI Energy is unable to retrieve the steam trap tool, then the current steam trap tool will be updated with the AML and net-to-gross.

Explain Whether or Not Rhode Island Energy (RI Energy) Decided to Adopt Recommendations from the Study:

RI Energy is adopting the adjusted measure life and net-to-gross ratio for the steam trap measures.

Savings Impact:

The lifetime savings of the steam trap measures will decrease.

Massachusetts Residential Building Use and Equipment Characterization Study – Phase 7

Type of Study: Impact

Evaluation Conducted by: Guidehouse

Date Evaluation Conducted: December 2023

Evaluation Objective and High-Level Findings:

The primary objective of this study was to collect saturation, characterization, and usage behavior data for all major electric and gas appliances, heating and cooling equipment, and electronics in Massachusetts homes.

Programs to which the Results of the Study Apply:

The results of this study are applicable to the Residential Programs.

Evaluation Recommendations included in the Study:

The study recommends updating the loadshape results for the following end uses:

- Water Heaters
- Refrigeration
- Clothes Washers and Dryers
- HVAC
- Dehumidifiers
- Pool Pumps
- TV and peripherals
- Lighting

Explain Whether or Not Rhode Island Energy (RI Energy) Decided to Adopt Recommendations from the Study:

RI Energy is adopting the updated residential load shapes developed from the study.

Savings Impact:

The updated loadshapes will impact the residential summer and winter demand savings.

Massachusetts Impact Shape Final

Type of Study: Impacts

Evaluation Conducted by: DNV

Date Evaluation Conducted: February 2024

Evaluation Objective and High-Level Findings:

The primary objective of this study was to update the commercial loadshapes. DNV collected new data from internal and external sources such as the National Renewable Energy Laboratory and Cadeo's Massachusetts Commercial Energy Optimization Model.

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Programs to which the Results of the Study Apply:

The results of this study are applicable to the commercial and industrial programs.

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Evaluation Recommendations included in the Study:

The study recommends updating the loadshape results for the following end uses:

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- Cooling
- Compressed Air
- Refrigeration
- Food Service
- Water Heating
- Process
- Exterior Lighting
- Interior Lighting
- Controls
- Heat Pumps

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Explain Whether or Not Rhode Island Energy (RI Energy) Decided to Adopt Recommendations from the Study:

RI Energy is adopting the commercial load shapes from the study.

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Savings Impact:

The updated loadshapes will impact the commercial summer and winter demand savings.

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Residential Heat Pump NEIs Study (MA21X21-E-RHPNEI)

Type of Study: Impact

Evaluation Conducted by: NMR Group, Inc., Three3, Inc., DNV

Date Evaluation Conducted: July 2023

Evaluation Objective and High-Level Findings:

The primary objective of this study was to update the non-energy impacts for heat pump measures.

Programs to which the Results of the Study Apply:

The results of this study are applicable to residential heat pump related measures.

Evaluation Recommendations included in the Study:

The study recommends updating NEIs associated with heat pump installations as provided in the report Tables 2 and 3.

Explain Whether or Not Rhode Island Energy (RI Energy) Decided to Adopt Recommendations from the Study:

RI Energy is adopting the heat pump NEIs for non-fuel switching measures and the NEI values provided for residential boilers and furnaces.

Savings Impact:

The added NEIs will increase non-resource benefits.

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