



# Task 1: Review of EM&V Processes

## *Summary Report*

Final February 2, 2021

Submitted to: Office of Energy Resources, State of Rhode Island

Submitted by:



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# Executive Summary

The Rhode Island Office of Energy Resources (OER) contracted with the BrightLine team (including subcontractors ILLUME Advising and DSA Analytics) to complete an independent evaluation of Rhode Island's evaluation, measurement, and verification (EM&V) efforts through this Energy Efficiency Programs Evaluation Study. EM&V is often seen as a critical component of a portfolio and program's lifecycle, using independent parties to verify and report on program impacts, processes, and opportunities for improvement. The overarching goal of this study is to understand whether there are improvements that can be made to the current EM&V process for National Grid's energy efficiency programs.

This report summarizes the findings from Task 1: Review of EM&V Processes, which intended to address the research topics listed below. The findings presented within this document are based on review of publicly available Rhode Island energy efficiency (EE) documentation and interviews with key stakeholders (National Grid, Energy Efficiency Resource Management Council (EERMC) consultants, OER, and National Grid evaluation vendors); interviews and surveys with Rhode Island EM&V and implementation vendors, and informal interviews with individuals that work with EM&V in other states.

This research is only a portion of the study, and focuses on EM&V planning, administration, and processes. Other tasks completed by the Brightline team delved into the effectiveness and accuracy of reported energy savings for commercial customers and benchmarked Rhode Island's Technical Reference Manual and impact evaluation activities with practices of similar jurisdictions.



*Does the current evaluation, measurement, and verification (EM&V) process in Rhode Island comply with national industry best practices for programs of its size and scope?*

The BrightLine team gathered information on:

- EM&V planning including frequency and level of investments in Rhode-Island-specific studies
- Decisions-making process on using Rhode Island-specific data for evaluation versus Massachusetts' EM&V results (covered in depth in Piggybacking Study)<sup>1</sup>
- Approach for applying results for quarterly and annual reporting and program and portfolio planning
- Effectiveness of the EM&V process for program administrators, EERMC, and evaluation and implementation vendors, including budgets and costs, timeliness of receiving results, and application of results

<sup>1</sup> DNV GL, "Rhode Island Piggybacking Diagnostic Study". Final January 14, 2020 (<http://rieermc.ri.gov/wp-content/uploads/2020/09/rhode-island-piggybacking-diagnostic-study-final-final-report-20200114.pdf>).

## OVERARCHING FINDINGS:

# Best Practice Assessment

There is no one definition of EM&V best practices. However, interviews and literature point to a common set of EM&V attributes that many jurisdictions constitute effective, if not best, practices for setting both EM&V and energy efficiency programming up for success.

National Grid Rhode Island follows many [EM&V best practices](#): Below highlights the BrightLine team's findings related to National Grid Rhode Island's activities related to the practices based on EM&V completed from recent programs years (approximately 2017 – 2019).

### PRACTICES

### BRIGHTLINE TEAM INSIGHT

#### Independent yet collaborative



**Assessment:** Accessible, responsive, and invested National Grid staff throughout the EM&V process with a collaborative stakeholder process, which interviewees believe strengthens the studies and confidence in results.

#### Strategically planned with flexibility



**Assessment:** New this 3-year (2018-2020) energy efficiency plan cycle, catalogued EM&V studies completed across time and used that assessment for planning to ensure each program is evaluated at least once a cycle.

**Opportunities:** Draft a strategic, preliminary three-year EM&V plan of studies within the three-year Energy Efficiency Plan. Document EM&V expectations for studies (e.g., rigor, confidence and precision, prioritization, funding levels, evaluation level and type within a 3-year cycle).

#### Prioritized activities



**Assessment:** National Grid and EERMC collaborate to prioritize EM&V to verify impacts of larger saving programs and measures based on customer-specific data (on-sites, billing analysis).

**Opportunities:** Integrate and sufficiently prioritize evaluations for pilot, assessment, and demonstration efforts (as illustrated in *2021 Pilots Demonstrations, and Assessments* filed as part of the Annual Energy Efficiency Plan for 2021<sup>2</sup>) to provide early insight and inform feasibility for expansion into the portfolio of approved energy efficiency programs.

<sup>2</sup> [rieermc.ri.gov/wp-content/uploads/2020/08/first-draft-2021-annual-energy-efficiency-plan.pdf](http://rieermc.ri.gov/wp-content/uploads/2020/08/first-draft-2021-annual-energy-efficiency-plan.pdf)

## PRACTICES

## BRIGHTLINE TEAM INSIGHT

### Balanced (process, impact, market)



**Assessment:** Conducts cross-cutting market-based research to inform baselines, naturally occurring activities, and program opportunities. Residential evaluations include process and impact evaluations.

**Opportunities:** However, C&I evaluations have been impact only; there has been no process evaluation of the C&I programs going back to 2013.

### Defensible approaches



**Assessment:** EM&V activities reference and follow industry-recognized guidance documents, such as publicly available evaluation protocols. EERMC provides critical oversight for further confidence in results and defensibility.

### Sufficiently funded to meet desired EM&V rigor



**Assessment:** From interviews and review of annual plans, EM&V funding is approximately 2% of program implementation budget and distributed across many studies. Piggy-backing made it possible to complete EM&V with this funding level.

**Opportunities:** Increasing Rhode Island samples and state-specific research may warrant additional EM&V funding as a percentage of implementation and/or additional trade-off analysis between number of studies, rigor, and cost. When setting EM&V funding, also consider reasonableness given Rhode Island's EM&V rigor standards and the fact that there is active EM&V oversight through the EERMC.

### Timely, with evaluation closely following program delivery



**Assessment:** Residential and market effects studies are integrated as soon as completed, sometimes within 4 months of contracting. Commercial impact evaluations have significant lag time.

**Opportunity:** Identify means to shift evaluation closer to project completion and use less time intensive activities to verify impacts where feasible and lower priority.

### Transparent reporting



**Assessment:** Review of EM&V reports show transparency in methodology and study limitations. The EERMC oversight also impresses and requires transparency through the review process.

**Opportunity:** Residential EM&V reports do not consistently report confidence and precision around impact evaluation point estimates, an area identified for improvement.

### Direct and expedient application of results



**Assessment:** Prospective, direct, and near real-time integration of EM&V results into annual program planning.

# Process-Related EM&V Challenges and Opportunities

This study identified the following **EM&V challenges** experienced in Rhode Island: These challenges raise **EM&V opportunities** for National Grid, OER, and stakeholder consideration. We present the challenges and opportunities below, structured by the following EM&V stages: planning and procurement, implementation, and reporting.

## Planning

**There is no formally documented expectation on level of EM&V rigor and precision across program-level evaluations.** Evaluators work with National Grid and EERMC consultants to establish expectations at the program level, and/or the level of rigor is set by expectations in Massachusetts (either where leveraging same approach or piggybacking on Massachusetts studies directly).

**Timeline and EM&V funding may not account for Rhode Island participant-specific studies (versus piggy-backing) as well as the oversight process.** As described earlier, any shift to additional Rhode Island-specific studies could require additional funding. Further, while, EERMC oversight is viewed positively from all perspectives, and their level of oversight is generally reasonable, this involvement, is not always fully accounted for in EM&V planning.

**EM&V needs to be closely integrated into program planning and implementation as National Grid efforts continue to innovate, evolve and expand their offerings.** To most effectively serve as a feedback loop and resource, evaluation should be integrated within these efforts, with level of effort and expectations varying by program/project activity and needs. EM&V funding levels should recognize these needs.

### OPPORTUNITIES RELATED TO PLANNING

- Continue to establish a multi-year strategic EM&V plan, allowing flexibility to revise annually
- Strategically prioritize high-impact and high program budget needs and identify where less expensive approaches can be taken
- Consider developing and documenting EM&V guidance to inform approaches and ensure consistency among vendors and programs
- Prioritize opportunities for early evaluation insights for pilots, assessments, and demonstrations (as documented in the *2021 Pilots, Demonstrations, and Assessments* section of the 2021 Annual Energy Efficiency Plan)



Procurement

**Annual EM&V contracting.** Unlike most states interviewed, National Grid Rhode Island contracted annually for EM&V, often with different EM&V vendors, and through a mix of sole source and competitive bid processes. This practice is inefficient and time consuming for National Grid staff, limits the ability to include EM&V vendor feedback into the planning and budgeting process, and limits flexibility gained through contracting with a team of contractors across multiple years. Recognizing these inefficiencies, National Grid recently solicited and awarded a single contract to provide EM&V for all residential programs across the next 3-year energy efficiency cycle (2021-2023).

OPPORTUNITIES RELATED TO PROCUREMENT

- Integrate EM&V vendors into the EM&V planning process
- Begin procurement or EM&V planning process earlier in the year, kicking off no later than January



EM&V  
Implementation

**EM&V implementation and reporting timeline is challenging, primarily affecting residential EM&V studies to-date.** EM&V implementation is often compressed into a short timeline, book-ended by bid and procurement processes and annual reporting needs. It is not unusual for a study to be contracted and completed (with results and reporting finalized) within four to five months. The timeframe is necessary as results directly and immediately inform planning, with planning and evaluation sometimes happening concurrently. While the timeframe is known and generally met by EM&V contractors, it puts strain on the EM&V process, particularly analysis and critical review process, as well as staff.

**C&I evaluation results are often applied multiple years after participation and exclude process evaluations.** Finalizing C&I program evaluations traditionally lagged considerably behind the relevant program year. Further, C&I program evaluations focused on impacts, with limited to no process evaluations, which may limit National Grid from more forward-looking prospective planning for this sector.

OPPORTUNITIES RELATED TO EM&V IMPLEMENTATION

- Allow sufficient time (recognizing studies take varying amounts of time) to complete EM&V studies that require process and impact evaluations.
- Identify how to narrow timeframe from participation to verification of results for C&I evaluations. For example, identify high-priority measures that require more extensive measurement and higher levels of rigor and establish specific plans for those measures so that they do not delay entire program reporting.
- Incorporate process evaluations for all programs, at least once per three-year cycle.



Reporting

**There can be considerable time and effort required from the review and feedback process.** There is a minimum three points of review and feedback from National Grid, EERMC, and OER. While recognized as valuable, and stakeholders attempt to make the review process as quick and efficient as possible, interviews note that this time may not be accounted for in the planning through implementation process.

OPPORTUNITIES RELATED TO REPORTING

- Recognize and build in sufficient time for review and feedback, integrating results presentations to make the reporting process more efficient and ensure stakeholders buy-in to streamline reporting.
- Prioritize feedback to methodological and finding-related concerns, recognizing that while feedback is valuable, overly extensive feedback can create delays as the evaluation teams strive to address each comment, big and small.

# 1 Introduction

The Rhode Island Office of Energy Resources (OER) contracted with BrightLine and their team of subcontractors (ILLUME Advising and DSA Analytics, “the BrightLine team” or “the team”) to complete an independent evaluation of Rhode Island’s evaluation, measurement and verification (EM&V) efforts through the Energy Efficiency Programs Evaluation Study. As described more fully in Section 3, EM&V intends to independently assess program activities and performance in terms of energy savings and processes. Research services provided through EM&V can also be used to provide insight into issues such as market conditions, future program opportunities, and potential response to new offerings.

The overarching goal of this study is to understand whether there are improvements that can be made to the current evaluation measurement and verification (EM&V) process for National Grid’s energy efficiency programs. The study is organized into three tasks, each with their own key objective:

- ▶ The key objective of Task 1 is to assess “Does the current Evaluation, Measurement, and Verification (EM&V) process in Rhode Island comply with national industry best practices for programs of its size and scope?”
- ▶ The key objective of Task 2 is to understand “Quantitatively, to what extent are National Grid’s claimed energy savings accurate?”.
- ▶ The key objective of Task 3 is to assess “Are there savings estimation and program implementation improvements that can be identified to help customers that have or are likely to experience a substantial difference in estimated gross energy savings versus installed gross energy savings and visible bill savings?”

This document provides summarizes results of **Task 1: Review of EM&V Processes** which characterized the current state of Rhode Island’s EM&V process through stakeholder interviews and review of Rhode Island’s EM&V documentation. We also reviewed EM&V processes throughout the country to identify practices that could be applied to improve Rhode Island’s EM&V process. The latter two tasks are ongoing and will be reported separate.

Note that this study is retrospective, primarily based on review of activities within the 2018 – 2020 Three Year Plan. At the time of this reporting, Rhode Island is finalizing their next three-year plan (2021 – 2023). Where relevant and publicly available, this report references EM&V processes that may be implemented in the next cycle.

## 1.1 Methodology

EM&V looks different across the nation. There are statewide EM&V models, statewide oversight with utility models, program administrators that separate process and impact evaluations, and those that

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prefer to comprehensively assess programs' evaluations by combining process, impact, and perhaps market evaluations in one study.

This task assessed Rhode Island (National Grid's) EM&V processes and outcomes with the intent of addressing the Rhode Island Offices of Energy Resources (OER)'s research question:

*"Does the current Evaluation, Measurement, and Verification (EM&V) process in Rhode Island comply with national industry best practices for programs of its size and scope?"*

Specifically, the BrightLine team used primary and secondary research to review:

- ▶ EM&V study specification approach including frequency and level of investments of Rhode Island-specific studies.
- ▶ Determination for which studies are based on Rhode Island versus Massachusetts' results and trade-offs of using results from other jurisdictions.
- ▶ Approach for applying results for quarterly and annual reporting and program and portfolio planning.
- ▶ Effectiveness of the EM&V process for program administrators and OER.
- ▶ Any concerns about the EM&V process and related costs or application of results including costs and timeliness of receiving preliminary and final results.
- ▶ Calculation of non-energy impacts and how they are incorporated in programming and reporting.

To better understand the Rhode Island's current EM&V process from all perspectives, the BrightLine team reviewed literature published within Rhode Island and other states, and conducted interviews with EM&V stakeholders, EM&V vendors, and EM&V representatives from other states, described below.

### 1.1.1 Documentation Review

The BrightLine team reviewed Rhode Island's program planning, reporting, and a sample of EM&V reports to better understand the existing EM&V process. Specifically, we reviewed the following, most of which are located on the EERMC website (<https://rieermc.ri.gov>):

- ▶ Energy Efficiency and Resource Management Council's (EERMC) quarterly and annual reports (2019 and 2020) (<https://rieermc.ri.gov/plans-reports/results-and-reporting/>)
- ▶ Energy Efficiency Program Plans (2019 and 2020) (<https://rieermc.ri.gov/plans-reports/ee-plans/>)
- ▶ 2018 – 2020 Energy Efficiency and System Reliability Procurement Plan (<https://rieermc.ri.gov/2018-2020-energy-efficiency-system-reliability-procurement-plan/>)

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- ▶ 2018 – 2020 Energy Efficiency Savings Targets (<https://rieermc.ri.gov/2018-2020-energy-efficiency-savings-targets/>)
- ▶ Results and Reporting (2019) (<https://rieermc.ri.gov/2019-results-and-reporting/>)
- ▶ Piggybacking Diagnostics Study (<https://rieermc.ri.gov/plans-reports/evaluation-studies/cross-cutting/>)

These documents provided insight into how EM&V results integrated into the various reports as well as three-year planning. The team also reviewed the reports to gain any insight into the strategic, 3-year EM&V planning process as discussed within the documents.

In addition, the team characterized the prior two years' EM&V efforts, targeting reports finalized within the prior two years. The review did not assess quality or accuracy; rather, type of research conducted and, to the extent possible, time lapse from program year and year finalized.

Finally, in preparation for the informal interviews with representatives from other states, the team culled the internet for information on EM&V and reporting approaches applied in other states and best practices. We leveraged our experience providing EM&V across the country, as well as publicly available resources such as the Environmental Protection Agency, regional energy efficiency organizations and American Council for an Energy Efficient Economy reports and websites, to identify states and gather this information. Through the review of publicly available information and primary in-depth interviews (discussed next), the BrightLine team assessed other states' EM&V practices to inform best – most effective – practices to provide context around Rhode Island's EM&V activities and inform opportunities for improvement.

### 1.1.1 In-depth Interviews

Below describe interviews with EM&V stakeholders, EM&V vendors, and EM&V representatives from other states completed as part of Task 1. In addition, the team leveraged current evaluation activities (e.g., staff interviews for the current EnergyWise Single-Family evaluation) to ask a few questions related to implementation vendors' interactions with the EM&V processes.

**EM&V stakeholders:** The BrightLine team spoke with eight individuals within the following stakeholder groups: National Grid staff, OER staff, and EERMC Consultants. Interviews explored the following issues:

- ▶ Structure of National Grid's Rhode Island energy efficiency programs and role of EM&V in the process and programming
- ▶ Frequency and level of investment of Rhode Island-specific EM&V studies;
- ▶ Trade-offs of conducting Rhode Island-specific research versus leveraging studies from other jurisdictions;
- ▶ Benefits and limitations of applying results from other jurisdictions;

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- ▶ How results are used in annual reporting and program/portfolio planning;
- ▶ Effectiveness of the EM&V process for stakeholders; and
- ▶ Concerns about the EM&V process, related costs, or application of results, including timeliness of receiving preliminary and final results.

**EM&V vendors:** National Grid contracts with a variety of vendors to provide EM&V services. The team spoke with five individuals from four firms, representing EM&V experiences from residential, non-residential, and cross-cutting studies. Interviews explored the following issues:

The interviews explored the following:

- ▶ Process, end-to-end, on working with National Grid Rhode Island on EM&V
- ▶ Communication with stakeholders and with implementation vendors
- ▶ Efficiency and timeliness across the various EM&V activities, including data receipt, review, and reporting
- ▶ Potential improvements in the Rhode Island EM&V process
- ▶ Any best practice experiences from outside of Rhode Island that could be valuable to include in the study

**EM&V representatives from other states:** The study included a benchmarking task, where the Brightline team identified and informally interviewed representatives from other states related to the EM&V practices within that state. Specifically, the interviews assessed the following types of issues, but not all interviews addressed all issues:

- ▶ Background on the state's EE/framework, and how EM&V is part of that framework
- ▶ Planning process for EM&V studies (e.g., annual, three-year)
- ▶ Reporting requirements for EM&V
- ▶ Application of EM&V results
- ▶ Stakeholder / oversight structure
- ▶ Integration of implementation contractors into EM&V
- ▶ Good/positive EM&V practices, and opportunities
- ▶ Total and percent of budget dedicated to EM&V

As seen from the list of research questions above, the interviews focused on broad, contextual issues, and to understand EM&V practices within that state's context. EM&V, its structure, and practices vary, therefore it was important to interview representatives from states with a range of EM&V experiences, and that also had some similarities to Rhode Island. Leveraging institutional knowledge and data

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collected through a number of sources, including Energy Information Administration (EIA), Consortium for Energy Efficiency (CEE), American Council for an Energy Efficient Economy (ACEEE), and regional energy efficiency organization, the BrightLine team identified states that appeared similar to Rhode Island in terms of one or several of the following characteristics:

- ▶ Total DSM spending
- ▶ DSM spending per customer
- ▶ Target or reported electric savings per capita
- ▶ Target or reported natural gas savings per capita
- ▶ Other issues such as state-specific models (e.g., statewide program administrator, engaged stakeholder oversight)
- ▶ Regional similarities including strength of DSM policies based on publicly available information from the American Council for an Energy Efficiency Economy (per their state ranking scorecards, where Rhode Island ranks third in the country<sup>3</sup>) and long-standing demand side management (DSM) history

We recognize that the data that informed the selection was not perfect and had many limitations, as documented within each of the sources. Recognizing the limitations, the data allowed the BrightLine team to identify states worth interviewing.

The BrightLine team interviewed representatives from the states listed in Table 1, which also lists the reasons those states were included. Representatives included program administrative staff, public utilities commission staff, and EM&V vendors that oversaw or closely worked with EM&V efforts within that state. The latter three states – Wisconsin, Illinois, and Oregon – were characteristically least similar to Rhode Island, but we felt valuable to include for some regional diversity.

**Table 1. States interviewed for benchmarking task**

State	Reason for Inclusion
Massachusetts	Northeast state Similarly strong DSM policies, ACEEE State Energy Efficiency Scorecard ranking #1 Similar DSM spending per customer Similar target electric savings per capita Similar target natural gas savings per capita Similar stakeholder oversight model (EM&V overseen by Energy Efficiency Advisory Council) <i>Total energy efficiency program funding is much higher than Rhode Island</i>

<sup>3</sup> <https://www.aceee.org/state-policy/scorecard>

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State	Reason for Inclusion
Vermont	<p>Northeast state</p> <p>Similarly strong DSM policies, ACEEE State Energy Efficiency Scorecard ranking #3 (tied with Rhode Island)</p> <p>Similar DSM spending per customer</p> <p>Similar target electric savings per capita</p> <p>Statewide program administrator</p> <p><i>Total energy efficiency program funding is lower than Rhode Island</i></p>
Maryland	<p>Northeast state</p> <p>Similarly strong DSM policies, ACEEE State Energy Efficiency Scorecard ranking #7</p> <p>Similar target electric savings per capita</p> <p><i>Total energy efficiency program funding is much higher than Rhode Island</i></p>
Connecticut	<p>Northeast state</p> <p>Similarly strong DSM policies, ACEEE State Energy Efficiency Scorecard ranking #6 on the scorecard</p> <p>Similar stakeholder oversight model (EM&amp;V overseen by Energy Efficiency Board)</p> <p><i>Total energy efficiency program funding is lower than Rhode Island</i></p>
Oregon	<p>Similarly strong DSM policies, ACEEE State Energy Efficiency Scorecard ranking #9</p> <p>Similar DSM spending per customer</p> <p>Historically strong DSM policies</p> <p>EM&amp;V primarily contracted and managed statewide</p>
Illinois	<p>Strengthening DSM policies, ACEEE State Energy Efficiency Scorecard ranking #11</p> <p>Similar target electric savings per capita</p> <p>Strong stakeholder oversight model (Statewide Advisory Group)</p>
Wisconsin	<p>Similar total DSM spending</p> <p>Statewide program administration</p>

## 2 Best Practices Defined

As described earlier, the overarching goal of this task was to address the question: *Does the current EM&V process comply with national industry best practices for programs in its size and scope?* Before being able to address that question, we need to articulate what it means to be a best practice EM&V.

A Google search of “energy efficiency evaluation best practices” brings up a host of links and resources, many of which are quite old (e.g., National Action Plan for Energy Efficiency) or state specific (e.g., California Energy Efficiency Evaluation Protocols, which is also old from 2006). The fact is, EM&V requirements are often established within rulemaking and policies, and the best practices fall within the nuances of how those requirements are implemented. Further, the best practice in one state might not work well in another depending on a host of factors<sup>4</sup>. We also recognize that, in many ways, best practices are subjective and based on the desired outcome from evaluation, which can be influenced by the position of policy, organization, or even person.

All these caveats aside, interviews completed for this study and publicly available literature identify the following areas that are considered best EM&V practices in our current energy efficiency program climate.

**Independent yet collaborative.** First and foremost, we cannot ignore the fundamental evaluation principal that evaluation needs to be independent. In years past, this led evaluators to take a very arms-length approach to evaluation, only communicating when necessary, for concern of bias. In more recent years, this perception has shifted, recognizing the importance of a more collaborative approach by program administrators and evaluators to maximize the value and relevance of

### Snapshot of Best Practices

Independent yet collaborative

Strategically and flexibly planned

Prioritized for maximum portfolio and ratepayer benefit

Balanced (process, market, impact)

Sufficiently funded to meet EM&V rigor

Defensible

Timely

Transparent reporting

Usable and used (applied results)

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<sup>4</sup> As described in the *National Energy Efficiency EM&V Standard: Scoping Study* sponsored by Lawrence Berkley National Laboratory in 2011: “what might be best practices in one states circumstances may not be appropriate for another state” (p.2). The report also warns that “application of best practices concepts in EM&V need to be applied with caution as differing evaluation objectives and budget levels may significantly influence characterization of best practices under varying circumstances” (p.21) (<https://emp.lbl.gov/sites/all/files/lbnl-4265e.pdf>).

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evaluation while still maintaining independence. Ideally the collaborative process integrates all those invested in program efforts, including policymakers, program administrators, implementation vendors, and working groups.

**Grounded in state-specific policies through longer-term EM&V contracting.** Energy efficiency programming is set and established in policies and rulemaking. It therefore behooves the evaluator, and evaluation processes, to plan for and complete evaluations with those specific policies and, if possible, provide guidance on where policies may need to be revised to the benefit of ratepayers. Longer-term contractual relationships with EM&V contractors (over more than one year, or across a single study) are often beneficial for that contractor fully understanding and integrating that knowledge within EM&V studies.

**Strategic EM&V planning with flexibility.** Evaluations should follow a similar cyclic planning cycle as program planning, starting with a longer-range multi-year strategic planning process that may be revised annually based on prior evaluation results, market research needs, and/or program and administrator-specific needs. The longer-term planning provides visibility into priorities and allows sufficient time for contracting and planning to implement EM&V activities. It should also coordinate with planning to ensure integration. Even the best laid plans need to change though, and flexibility is critical for ensuring responsiveness to program needs.

**Prioritized activities to optimize funding and meet research and program needs.** Regardless of funding levels, study designs and planning should be thoughtful, ensuring resources are directed to areas that have the greatest need for input, greatest uncertainty, and/or highest impact on the portfolio. Prioritization goes beyond simply high impact measures to include need for formative and process-related efforts to inform pilot, assessment, and demonstration project progress, critical for driving innovation and risk management throughout that innovation.

**Balanced, integrating process and impact evaluations within the context of market conditions.** Impact evaluation results (including cost-effectiveness) may be a result of process issues. Market conditions directly affect program impacts. And process evaluations are not complete without understanding program impacts. Evaluations ideally integrate process and impact activities and include market-related research to ensure baselines are accurately captured.

**Sufficiently funded to provide as rigorous EM&V possible to meet minimum EM&V requirements and address stakeholder needs.** EM&V funding is often allocated as percentage of program expenditures. Numerous sources, including ACEEE and the Consortium for Energy Efficiency (CEE) report that EM&V funding ranges. Historically, rule of thumb set funding to approximately 3- 5 percent of program or portfolio budgets<sup>5</sup>, although that range has been shifting downward with the most recent

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<sup>5</sup> <https://www.aceee.org/toolkit/2020/02/evaluation-measurement-verification>

CEE report<sup>6</sup> citing 2-4% in 2017, slightly down from 2-5% reported in 2016 (although with caveats, see the footnote below). There are levers that affect that percentage. Larger portfolio budgets, by virtue of their size, may not warrant as high of a portion allocated to evaluation. Conversely, it may be necessary to allocate a larger percentage of a portfolio budget to evaluation when those budgets are smaller. This is also true when evaluating emerging or pilot programs, where budgets tend to be low, yet research and evaluation is critical for assessing program performance, processes, and feasibility for continuation.

**Defensible, follows standard, approved, and proven approaches.** There are resources developed over the past decade (and more) to standardize, or at minimum provide detailed guidance, on EM&V practices. The resources include, but are not limited to, the International Performance Measurement and Verification Protocol (IPMVP), Uniform Methods Project (UMP), and guidance developed at the state or regional level.

**Results in as real-time...as possible.** Timely evaluations allow programs to course correct as needed, and before a program is too far along and/or evaluation results are provided too late to be useful. Much like “best practices”, the definition of “real-time” is variable and subject of much discussion. At the end of the day, conducting evaluations, and receiving results, as close to program delivery is the most valuable. This best practice applies to both process and impact evaluations Thoughtfully embedding research at the early stages of programs is incredibly valuable for informing processes and for the viability of new initiatives, demonstrations, and pilots. Further, identifying issues around impacts – as well as verifying accuracy – provides a safeguard against replicating errors and inaccurate reporting of energy savings.

## EM&V should do the following with regard to best practices:

Be integral to a typically cyclic planning-implementation-evaluation process.

Support the programs being evaluated...by providing appropriate documentation of progress toward goals, as well as feedback required...to continuously improve the programs and plan future efforts

Utilize industry-standard EM&V methods, analytical tools, and data-collection methods to the furthest extent possible

Be based on budgets and resources adequate to support – over the entire evaluation cycle – the evaluation goals and level of quality (certainty) expected in the evaluation results.

***SEE Action Guide for States: Evaluation, Measurement, and Verification Frameworks Guidance for Energy Efficiency Portfolios Funded by Utility Customers***

[https://www4.eere.energy.gov/seeaction/system/files/documents/EMV-Framework\\_Jan2018.pdf](https://www4.eere.energy.gov/seeaction/system/files/documents/EMV-Framework_Jan2018.pdf)

<sup>6</sup> [https://library.cee1.org/system/files/library/13981/CEE\\_2018\\_AnnualIndustryReport.pdf](https://library.cee1.org/system/files/library/13981/CEE_2018_AnnualIndustryReport.pdf). See page 46 for limitations on CEE’s analysis which includes incomplete data and inconsistent timeframes for reporting evaluation funds.

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**Usable and used, with clear application of EM&V results.** EM&V has clear purposes which include validating claimed savings and informing future program activities and changes. No one wants EM&V results to sit on a shelf and not be used. The most effective EM&V results are the ones where results are clearly and directly applied.

**Transparent reporting, recognizing shortfalls and limitations in approach.** There are many limitations in evaluation. These include biases introduced from sampling or data collection processes, data quality issues, and limited sample sizes, to name a few. Evaluations need to be transparent and recognize these issues where they occur.

In addition to the above, the following practices are also often discussed when determining best practices. How states implement these practices are different, and there could be varying opinions on whether or how these practices should be integrated depending on funding and state policy objectives, but worth calling out in this section.

**EM&V oversight by independent contractor(s).** Evaluating the evaluators: this is a model often employed by states where regulatory and other stakeholder organizations want to extend their staffing expertise via contract to ensure EM&V is defensible and accurate.

**Prospective application of results.** The industry continues to shift toward a prospective, versus a retrospective, application of EM&V results. Programs are planned with specific assumptions on-hand, which affect cost-effectiveness. Retrospective application theoretically programs the program team for issues that they may not have been aware of or known. Prospective evaluation allows the program team to react to and adjust for those results. The timing of applying results prospectively varies by state, but many jurisdictions that the BrightLine team works with allow for time to finalize evaluation results and integrate into the next program plan (e.g., 2019 evaluated programs, evaluated results in mid-2020, will be used for program year 2021 planning).

**Net-to-gross (NTG).** Net-to-gross (NTG) is always a discussion for debate, and as such likely not a useful metric to include as a best practice. What is a best practice is ensuring funding is used wisely and to the benefit of ratepayers, which includes ensuring that the dollars are not funding measures or behaviors that are naturally occurring in the market? With this, NTG research is in fact a way to ensure an evaluation is comprehensive and market focused.

**Confidence and precision targets.** Evaluation uses confidence and precision levels to quantify statistical error. It is standard to target a 90% +/- 10% confidence and precision when sampling for and implementing evaluation studies. In other words, within a 90% confidence interval the actual statistical value is no greater than plus or minus 10% of the estimate found through the study. More costly activities conducted as a subset of the evaluation, such as on-site visits, can target lower confidence and precision (e.g., 80/20) when planning studies. Not all states set out requirements for confidence and precision, and the frame of reference for which this target confidence and precision

## Summary Report

applies varies by state (such as expectations to meet confidence and precision levels at the measure or program level and annually or at the energy efficiency program cycle level).

## 3 Defining and Contextualizing EM&V

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*Synopsis. National Grid is the largest Program Administrator (PA) in Rhode Island, providing electric and natural gas services to over 90% of the state's population. They offer energy efficiency programs to their customers within three-year planning cycles, the most recent being 2018 – 2020. The Energy Efficiency Resource Management Council (EERMC) and Office of Energy Resources (OER) oversees the PA's efforts. National Grid hires independent program evaluators to provide **impact, process, and cross-cutting market** evaluation services for approved energy efficiency and **pilot, demonstration, and assessment** projects. They historically leveraged and applied results from studies completed in Massachusetts, as described in the recently completed **piggybacking** assessment completed by DNV GL. Doing so gives National Grid the flexibility to focus finite EM&V funds where most beneficial or necessary to gather Rhode Island specific data. The state and National Grid are revisiting when they piggyback Massachusetts studies looking into the next program cycle.*

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Before discussing evaluation processes, it is valuable to level set on evaluation terminology and provide overarching context related to Rhode Island EM&V. Below describes evaluation types, distinctions in pilots, demonstrations, and assessments, and piggybacking practices to-date (use of Massachusetts results in Rhode Island), followed by a list of EM&V studies completed up to 2019.

### 3.1 Evaluation Types

National Grid conducts EM&V studies, categorized by three types:

- **Impact**
- **Process**
- **Cross-cutting (which includes market evaluations)**

**Impact evaluations** generally strive to verify and measure savings at a measure or measure-group level (e.g., central air conditioning or electric HVAC), to be integrated into program planning and cost-effectiveness testing. The results feed directly into the technical reference manual (TRM)<sup>7</sup> which houses algorithms and input assumptions to calculate savings for measures offered by National Grid Rhode Island. National Grid also maintains a database that captures all measures and related savings

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<sup>7</sup> As a reference, the 2020 TRM can be found at <http://rieermc.ri.gov/wp-content/uploads/2019/11/ngrid-ri-2020-trm.pdf> (referenced on 9/8/2020)

(electric, natural gas, and oil) which they update with the new and/or final savings values. These resources capture savings and impact adjustment factors, such as:

- **In-service rates (portion of efficient units installed)**
- **Persistence factors (portion of first year savings expected to persist the life of the measure)**
- **Realization rate (portion of measure savings verified through the impact evaluation activities)**
- **Net-to-gross (NTG) (portion of savings attributable to the program, removing savings from free-riders, or those who would have completed the work absent National Grid's program efforts, and adding savings for spillover, or additional energy saving actions not claimed through National Grid programs)**

Impact evaluation results are prospective, meaning they are applied for the next year's annual planning process. For example, impacts finalized by late summer 2019 will be applied to program year 2020 planning. Impacts finalized in late 2020 will be applied to the next 3-year plan (2021-2023) as well as set annual plan targets for program year 2021 (planning is discussed in the next section).

There is no stated requirement or expectations related to rigor of impact evaluations. As one interviewee noted, rigor comes into play in the methods, thoughtfulness of results, and transparency in planning and reporting related to study limitations. Stakeholders, through their technical oversight, and EM&V contractors typically recommend level of rigor, as feasible within budget and timeline constraints. That said, there are some general consistencies related to EM&V expectations and rigor:

- **Plan at the measure level; therefore, need to evaluate at the measure-level**
- **Target a minimum level of precision of 90% +/- 10% where practicable based on population size**
- **Use primary data, including metered results, where possible**

**Process evaluations** research and document program-related process issues. Process issues can be defined very narrowly, focusing on very specific areas of interest, or broadly, assessing program processes from all perspectives (e.g., internal program operations and processes as well as external customer, market, and contractor experiences). Types of process issues that may be investigated include program design effectiveness, participation barriers, satisfaction, tracking data accuracy, resource constraints or needs, marketing effectiveness, training needs, communication effectiveness, and so on.

**Cross-cutting research and evaluation:** In Rhode Island, this category typically captures market-related studies, such as residential appliance saturation surveys and lighting stocking studies. The

results inform program design, baselines, and market practices, but do not directly measure savings and processes.

### 3.2 EM&V for Pilots, Demonstrations, and Assessments

In 2019 National Grid RI established the Customer Energy Management Growth team as part of their commitment to foster and drive energy efficiency innovation within the state. Through this group, National Grid designs and implements pilots, demonstrations, and assessments. National Grid proposed approximately 14 pilots, demonstrations, and assessments for the 2020 plan year<sup>8</sup>.

Prior to 2018, all new offerings were through pilots. Since then, the Public Utilities Commission along with OER and National Grid further differentiated these groups into pilots, demonstrations, and assessments (see right for definition).

There are currently three stages for pilots, demonstrations, and assessments; evaluation integrates with the latter two of these three stages:

1. **Ideation: concept idea is researched and savings and cost potential assessed for viability;**
2. **Design: idea becomes a pilot, demonstration, or assessment for implementation, integrating feedback from the evaluation team;**
3. **Early implementation and evaluation: deployment and evaluated and, if deemed viable based on early delivery, idea is further developed using insights from evaluation**

Within this framework, EM&V is highly **developmental** and **embedded** within program offerings. Meaning, it informs programs throughout development stage and is integrated into programs for quick, real-time feedback.

This is a relatively new framework. Several stakeholders interviewed described the collaboration process between OER, EERMC consultants, and National Grid to determine how and when to evaluate

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## Pilots, Demonstrations, and Assessments Defined

**Pilots:** A small scale, targeted program designed to test the feasibility of a future program or rate design. Explores technologies or approaches not included in the core energy efficiency programs.

**Demonstrations:** Tests a new technology or solution delivered as part of an existing program where technical analysis estimated savings and determined the technology or solution to be cost effective.

**Assessments:** Measure, bundle of measures, or solution where savings are unknown but can be explored through integration with an existing program.

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<sup>8</sup> 2020 Pilots, Demonstrations, and Assessments, drafted as part of National Grid's 2020 Energy Efficiency Plan (<http://rieermc.ri.gov/wp-content/uploads/2019/09/2020-eepp-attachment-8-pilots-third-draft.pdf>)

these new offerings, although interviews were not yet able to comment on its effectiveness to-date. However, as described earlier, using evaluation in this way is a best practice.

### 3.3 Piggybacking

Rhode Island is unique from other jurisdictions in the following ways:

1. **One Investor-Owned Utility – National Grid – provides natural gas and electric service to the majority (at least 95%) of the state and is the only utility in Rhode Island that conducts evaluation for their energy efficiency programs.**
2. **Their neighboring state is Massachusetts, which by program administration size has significant budget for EM&V (up to eight times that of Rhode Island), where National Grid is incidentally one of the largest program administrators**
3. **National Grid, operating across multiple states including Massachusetts, contracts with many of the same organizations to deliver their programs, resulting some similarities in Rhode Island’s program designs and delivery.**

All these points lead to extensive leveraging of Massachusetts studies and, to some extent, applying the results to Rhode Island programs, referred to as “piggybacking.” As described in the recently completed Piggybacking Diagnostics Study (the Piggybacking Study), Rhode Island takes one of five approaches to estimating and applying verified impacts to their programs:

Approach	Application
1. Direct Proxy	Use Massachusetts Results directly for Rhode Island
2. Shared Algorithm	Calculate savings using data collection results from MA, applied to an independent RI sample using similar formulas
3. Pooled Sample	Combine sample and collect data from RI and MA sites so that sample is large enough to meet precision requirements in RI
4. Independent Sample	Conduct data collection and analysis on an independent RI sample, using the same approach and tools as MA
5. Independent Study	Conduct a study completely independent from MA

Source: Rhode Island Piggybacking Diagnostic Study

Per interviews, Rhode Island historically leverages Massachusetts studies where: 1) the Massachusetts study timing is favorable for Rhode Island reporting needs; 2) Massachusetts markets are demonstrably similar to Rhode Island, and/or 3) vendors and program delivery are the same across states. While National Grid and stakeholders (including EERMC Consultants) coordinate regularly on when and how to use the Massachusetts results, the process for determining how and when to piggyback on Massachusetts studies, and implications for doing so, had not previously been systematically reviewed prior to 2019. The Piggybacking Diagnostic Study did just this, detailing when and how Rhode Island piggybacks on Massachusetts results and provided recommendations around that practice.

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Historically, National Grid Rhode Island meets with the EERMC consultants, many of whom also serve in a similar role within Massachusetts, to discuss upcoming studies. They will identify Massachusetts studies underway or soon to be underway and determine if it is possible, or most cost-effective, to use the results of that study. Doing so frees up evaluation funds for other studies. The types of considerations made to determine if piggybacking should be done are:

- **Vendors the same**
- **Programs are designed and delivered the same (including measure mix)**
- **Populations served the same or similar**
- **Codes and baselines are the same or similar**
- **National Grid Rhode Island's EM&V budget is insufficient to produce Rhode Island specific point estimates with desired confidence and precision**

To-date, most of the residential program evaluations used independent samples or independent studies, and the C&I program evaluations, and many of the market evaluations, used a pooled sample approach. According to the Piggybacking Study, using the pooled sample approach saved approximately 50% to 75% of evaluations costs for those studies, reducing National Grid's overall EM&V budget needs and allowing them to direct funds to other Rhode Island specific studies.

The Piggybacking Study recommended National Grid Rhode Island move toward independent samples or independent studies approach for most programs, which National Grid had begun implementing prior to the finalization of the study. This shift would likely necessitate an increase in EM&V funding as well as additional prioritization and strategic planning of what and how to estimate measure-level and program-level impacts.

The Piggybacking Study goes into considerable analysis and detail on the considerations, benefits and drawbacks, and recommendations for using Massachusetts studies in Rhode Island. While an important component in the EM&V processes, for brevity and focus this report does not go into any further analysis or discussion on the ins and outs related to piggybacking. The reader is referred to that study for more details on this topic<sup>9</sup>.

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<sup>9</sup> <https://rieermc.ri.gov/plans-reports/evaluation-studies/>

### 3.4 Studies Completed

Prior two years’ studies (2018 and 2019) include the following, represented in Table 2. A few things to note, some of which will be further highlighted in the following sections:

- **National Grid hires a variety of contractors to complete the work**
- **The studies represent a mix of impact, process, and market studies, with lighting market studies comprising a majority of the studies**
- **In the case of C&I programs, there is considerable lag between evaluated year and when the report was finalized.**

Table 2. National Grid Rhode Island Specific Studies Completed in 2018 and 2019

Sector	Study	Evaluated Year	Date Finalized	Contractor	Impact Eval	Process Eval	Market Eval
Cross-sector	Workforce Assessment Associated with National Grid’s 2018 EE Programs	2018	5/3/19	Peregrine Energy			x
Cross-sector	City of Providence Building Energy Code Compliance Process Review	N/A	5/15/2019	Slipstream			x
Cross-sector	Analysis of Job Creation from 2017 National Grid Rhode Island Energy Efficiency Programs	2017 2016	4/25/18 4/24/17	Peregrine Energy			x
Residential	Shelf Stocking Study	2018	8/7/19	NMR			x
Residential	Lighting Sales Data Analysis (2017)	2017	4/23/19	NMR			x
Residential	Lighting Sales Data Analysis (2018)	2018	9/18/19	NMR			X

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Sector	Study	Evaluated Year	Date Finalized	Contractor	Impact Eval	Process Eval	Market Eval
Residential	Baseline Study of SF New Construction	N/A	1/16/18	NMR			X
Residential	HEAT Loan Assessment	2014 – 2017	11/19/18	Research Into Action		x	
Residential	Seasonal Savings Evaluation <sup>1</sup>	2017	3/9/18	Navigant	X		
Residential	Residential Wi-Fi Thermostat DR Evaluation	2017	3/3/18	Navigant	x		
Residential	Lighting Market Assessment	2018	7/27/18	NMR			x
Residential	Residential Appliance Saturation Survey	N2017 - 2018	10/11/18	NMR			x
Low Income	Income Eligible Process Evaluation	2018	8/20/19	Cadeo		x	
Low Income	Income Eligible Services Impact Evaluation	2015 - 2016	8/30/18	Cadeo	x		
Residential	Behavioral Persistence Lit Review	N/A	2018	ILLUME	x		
C&I	C&I Custom Comprehensive Design Approach	2013 - 2015	1/25/19	DNV GL	X		
C&I	C&I Custom Gas Installations	2016	12/9/19	DNV GL	X		
C&I	C&I Small Business Initiative	2016	6/17/19	DNV GL	x		
C&I	C&I Upstream Lighting Initiative	2015	9/5/18	DNV GL	x		

<sup>1</sup>Study conducted in collaboration with Massachusetts

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As described later, National Grid began documenting study history by program as a means for strategic EM&V planning. The following table documents the historic studies, and planned studies for 2020 per the 2020 Annual Plan.

This planning table shows that National Grid evaluated most programs at least once within a cycle. (The exception is Prescriptive Lighting, which has not received an evaluation since 2013.) **Residential** programs had both process and impact evaluation completed, with lighting receiving specific attention with market evaluations. **C&I** evaluations were almost exclusively focused on impact evaluations. While there were market studies completed for the C&I sector, there were no process-related studies completed. **Pilots, demonstrations, and assessments** are called out and began to receive EM&V more systematically in 2019 and 2020.

Table 3. National Grid Rhode Island Study Tracker

Sector	Program	Study type	2013	2014	2015	2016	2017	2018	2019	2020 Plan
Residential	EnergyWise SF	Impact								
	EnergyWise SF	Process						HEAT Loan		
	Income Eligible SF	Impact								
	Income Eligible SF	Process								
	EnergyWise MF	Impact								
	EnergyWise MF	Process								
	Income Eligible MF	Impact								
	Income Eligible MF	Process								
	Home Energy Reports	Impact								
	Home Energy Reports	Process								
	EnergyStar Lighting	Impact/Market								
	EnergyStar Products	Impact								
	HVAC	Impact								
HVAC	Process									
Market Studies	Potential Study	Market								
	Job Impact	Jobs								
	Avoided Cost	Benefits								
	REMI	Benefits								
	Participation	Market								
	RASS	Market								
	Gas Peak Demand Savings Study	Impact								
	Piggybacking Study	Process								
	Heat Pumps Study	Market								
	Codes & Standards	Impact/Market								
Legislated M&V Study	Market									
Pilots/Demos/ Assessments	Demand Response	Impact								
	Home Energy Monitoring	Impact/Process								
	SEM Demonstration	Impact								
	Small Business HP Demo	Impact/Process								
C&I Electric	Custom	Impact								
	HVAC	Impact								
	Industrial Process	Impact								
	CAIR	Impact								
	Refrigeration, Motors, Other	Impact								
	Custom Lighting	Impact								
	Street Lighting	Impact								
	CDA	Impact								
	CHP	Impact								
	Prescriptive Lighting	Impact								
	Upstream Lighting	Impact								
	Upstream Lighting	Process								
	Prescriptive HVAC	Impact				chillers				
	Prescriptive VSD	Impact								
Prescriptive CAIR	Impact									
All	NTG									
C&I Gas	Custom	Impact								
	Prescriptive	Impact			steam traps					
	All	NTG								
Small Business	Lighting	Impact			prescriptive					
	Non-Lighting Electric	Impact								
	All	NTG								

Historical Evaluation Studies (<http://rieermc.ri.gov/wp-content/uploads/2019/11/ngrid-ri-2020-annual-ee-plan.pdf>, page 430)

## 4 Rhode Island EM&V Structure and Processes

This section describes the EM&V structure and processes as identified through documentation review and interviews within the following areas.



Key Players and Responsibilities with EM&V

Energy Efficiency Program and EM&V Planning

Procurement of EM&V vendor(s)

EM&V Implementation

Reporting

Before delving into the details of the EM&V structure, we provide a synopsis of the standard EM&V process (next page). While the illustration is linear – as is the general processes in terms of a timeline – EM&V is, in reality, quite cyclical, with evaluation activities, findings, and reports informing planning and EM&V activities in the next year and/or cycle.

<p>1</p>	<h2>INITIAL PLANNING</h2> <p>As part of the annual planning process, <b>National Grid</b> collaborates with the <b>OER</b> and <b>EERMC Consultants</b> to prioritize, identify, and establish studies and allocate budgets for EM&amp;V activities, which informs study-specific scopes of work. <b>National Grid</b> then procures EM&amp;V vendors (competitive or sole sourced).</p>	
<p>2</p>	<h2>KICK OFF MEETING(S)</h2> <p>The selected <b>EM&amp;V vendor</b> meets with <b>National Grid</b> and potentially the <b>OER</b> and <b>EERMC Consultants</b> to kick-off the project. They use this meeting to discuss and come to consensus on study needs, priorities, and research objectives using the initial planning and procurement response (if applicable) a starting point. The kick-off meeting is also an opportunity to present and discuss methodological approaches.</p>	
<p>3</p>	<h2>DETAILED PLANNING</h2> <p>The <b>EM&amp;V vendor</b> drafts a detailed EM&amp;V plan. The detailed plan typically builds off the scope of work developed in the initial planning phase, and integrates feedback from the kick-off meeting. The <b>EM&amp;V vendor</b> may present the plan via conference call(s). <b>National Grid</b> and <b>OER</b> and <b>EERMC Consultants</b> review and provide feedback on the plan, which the <b>EM&amp;V vendor</b> incorporates into a final draft (for final review) and then final plan. Follow-up meeting(s) may be held to discuss feedback.</p>	
<p>4</p>	<h2>EM&amp;V IMPLEMENTATION</h2> <p>The <b>EM&amp;V vendor</b> completes the activities as laid out in the final detailed EM&amp;V plan. The activities vary by study, but include activities such as:</p> <ul style="list-style-type: none"> <li><b>Data acquisition:</b> Request, receive, and organize data (program, customer, project)</li> <li><b>Analysis planning:</b> Establish draft analysis plan, deliver and potentially present to <b>National Grid</b>, <b>EERMC Consultants</b>, and <b>OER</b>, revise, and finalize</li> <li><b>Data collection:</b> Including designing data collection instruments (draft, revised draft final draft, final) and implementing data collection (on-sites, surveys, interviews, etc.)</li> </ul>	
<p>5</p>	<h2>EM&amp;V REPORTING</h2> <p>The EM&amp;V vendor documents the findings within a number of deliverables, which <b>National Grid</b> and the <b>OER</b> and <b>EERMC Consultants</b>, at minimum review. The types of deliverables include, but are not limited to:</p> <ul style="list-style-type: none"> <li><b>Presentation(s) of results</b>, including interim findings as well as final, comprehensive findings and recommendations</li> <li><b>Draft, revised draft, final draft reports</b>, with additional revisions or draft deliverables (such as interim, task-focused reports) as needed</li> <li><b>Final report</b> to upload to the <b>EERMC</b> website</li> </ul>	
<p>6</p>	<h2>EM&amp;V APPLICATION</h2> <p><b>National Grid</b> and program stakeholders apply EM&amp;V results prospectively, integrating findings into the next Annual Energy Efficiency Plan. The program team may communicate results with implementation vendors to provide feedback and inform program design opportunities.</p>	

## 4.1 Key Players and Responsibility with EM&V

Key players that interact with EM&V in Rhode Island can be organized into the following groups: National Grid team, stakeholders, and vendors. Below briefly summarizes their roles with program planning and EM&V.

### 4.1.1 National Grid Team

Various groups within the National Grid team work with Rhode Island’s energy efficiency programs. Below are the key groups within National Grid that interact with and their roles related to EM&V. Each group informs the other within the energy efficiency system. Strategy and policy set the goals. Implementation (including account managers, program managers, and the technical (engineering) groups) provides the inputs, including savings and costs. EM&V informs the inputs through research and verification. And procurement and data team support all processes by enabling the implementation and EM&V teams to do their jobs.

### Key National Grid Groups and Roles Related to EM&V

#### Strategy and policy team

Leads annual planning, annual reporting, and three-year planning process  
 Runs cost-effectiveness tests using inputs developed in conjunction with program managers (implementation team) and inputs developed by the EM&V team  
 Identifies National Grid’s strategies for implementing energy efficiency programs

#### Implementation team

Informs studies by communicating program needs  
 Participates in EM&V activities (interviews)  
 Reviews deliverables

#### EM&V team

Collaborates with policy/strategy team and program implementation to identify program needs  
 Leads the evaluation planning process (including study prioritization and scope development) with inputs from OER and EERMC.  
 Leads procurement of evaluation vendor(s)  
 Manages EM&V contractors including review of all relevant deliverables  
 Facilitates data requests with data teams  
 Coordinates study progress and review of deliverables with OER and EERMC  
 Meets regularly with OER and EERMC consultants  
 Integrates impact results and process improvements in the EE Annual Plans

**Data team**

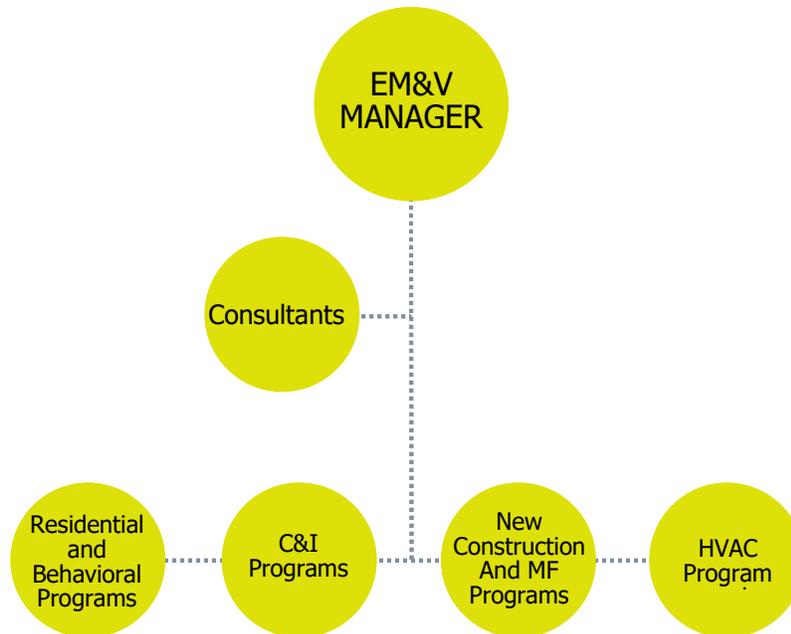
Develops Technical Reference Manuals to document savings assumptions  
QC of program savings in Annual Year End Reports

**Procurement**

Responds to data requests  
Maintains measure and impacts database  
Maintains customer data  
Works with EM&V team to develop and distribute RFP  
Contracts with selected vendors

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There are five core members of National Grid's EM&V team. The EM&V manager leads the team, providing support and guidance to the EM&V team through regular meetings and participation in stakeholder discussions. As of this reporting, four EM&V team staff are responsible for individual program EM&V, organized by topic, as shown below. All staff oversee EM&V activities across multiple states, including Massachusetts and New York. National Grid also contracts with independent consultants who bring institutional knowledge and understanding of EM&V to consult with the National Grid EM&V team.



Each EM&V member has experience in policy, program implementation, and/or evaluation, and several came to National Grid with EM&V practitioner backgrounds. National Grid's consultants provide decades of expertise in program planning, implementation, and EM&V oversight.

#### 4.1.2 Stakeholders

There are a host of stakeholders engaged in Rhode Island’s energy efficiency efforts, including the Public Utilities Commission and environmental advocates. Below highlights stakeholders most actively involved in EM&V activities: Office of Energy Resources and the Rhode Island Energy Efficiency and Resource Management Council (EERMC) and their consultants.

### Key Stakeholder Groups and Roles Related to EM&V

#### Office of Energy Resources (OER)

Connect program and policies with stakeholders; translate and communicate results for stakeholder consumption (including general public, environmental advocates, municipalities, etc.)

Provide oversight of National Grid energy efficiency evaluations

Manage and coordinate with EERMC consultants on behalf of the EERMC (referred throughout at EERMC consultants)

Review National Grid energy efficiency activities with an eye to policy, existing and emerging (e.g., electrification)

Meet twice a month with National Grid EM&V team and the EERMC consultants (separate for residential and C&I teams)

Meet bi-weekly with National Grid implementation team and EERMC consultants

Provide input to EM&V scope of work

Review and provide feedback on project deliverables and work products, including interim and full study EM&V reports

#### Energy Efficiency and Resource Management Council and Consultants (EERMC)

Provide oversight of National Grid energy efficiency planning, implementation, and evaluation activities

Develop and publish annual reports documenting progress toward goals

Provide input to EM&V scope of work

Review and provide feedback on EM&V reports

Meets twice a month with National Grid EM&V team and OER (per above)

Review and approve TRM updates and cost-effectiveness models

Involvement and integration of the EERMC Consultants in EM&V evolved over the years.

The EERMC consultants are a team, currently inclusive of four contractors: a contract lead and three contractors responsible for specific areas of oversight (shown right).

According to interviews with EERMC consultants, the EERMC continue to improve EM&V coordination and, subsequently, quality throughout the process. As an example, they instituted processes to improve EM&V study transparency, from planning to reporting. The EERMC consultants worked with National Grid, OER, and EERMC to establish a process that integrated the EERMC at all stages of EM&V. They also created a study tracker which continues to evolve annually. The tracker includes detailed study notes including dates and key results of meetings to keep everyone accountable for action items. The tracker also provides a historic record of comments, issues, and decisions.

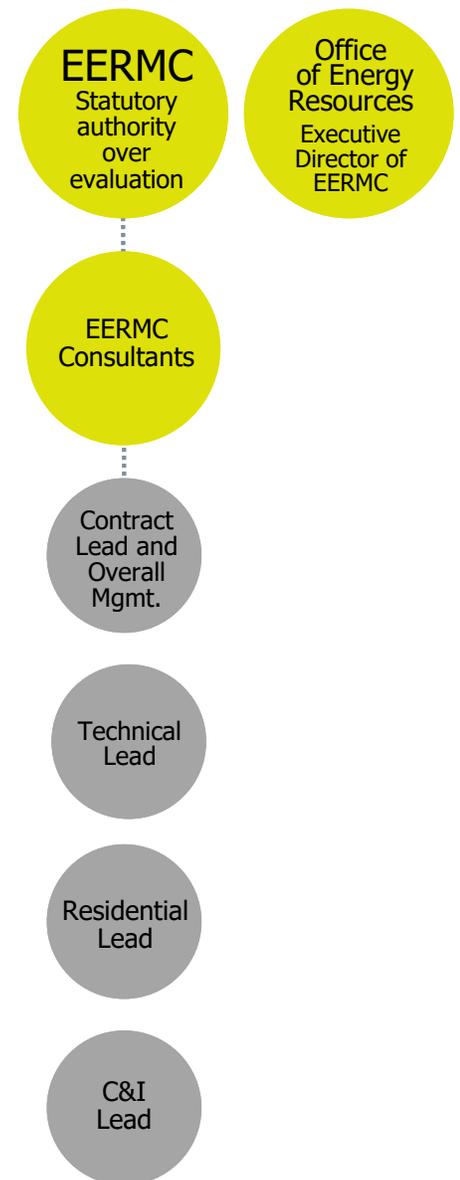
Interviewees describe the stakeholder engagement process as:

- **Efficient**
- **Risk mitigating, addressing issues early on so there are fewer later in the study**
- **Confirming and reassuring**
- **Of great value**

At the same time, they describe the cost to a study, both in terms of total dollars but perhaps as importantly in terms of time. The latter is especially important when evaluations are on a short timeline and the evaluation team is faced with responding to not one set, but sometimes up to three or four sets of individuals' comments at multiple points throughout the study.

Interviews with the EERMC consultant team reveal they are cognizant of this issue, and Optimal Energy in their coordination role continues to attempt to improve on this issue by managing and consolidating feedback and scheduling meetings as needed to attempt to resolve issues efficiently.

Evaluators interviewed also recognized the benefits often outweigh these costs and discussed various strategies to working with stakeholders when resource constrained, including: sharing detailed



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methodologies for approval prior to implementation of the studies and providing early (and if needed mid-project) presentations to identify and circumvent any methodological or quality issues EERMC consultants may see.

*Stakeholder integration within the EM&V process, while on the whole positive, is a challenge insofar as EM&V study timelines and budgets are constrained. It is important to right-size all of the above (timelines, budgets, and level of stakeholder integration and feedback) based on study importance.*

### 4.1.3 Vendors

National Grid contracts with vendors to deliver, and vendors to evaluate, their energy efficiency programs. Table 4 below lists the EM&V vendors they contract with (as of this reporting) and example of the studies they conducted as part of the EM&V process over the past three to four years.

#### 4.1.3.1 EM&V Vendors

National Grid Rhode Island tends to contract with EM&V vendors that conduct EM&V of similar programs in Massachusetts. **DNV GL** completed all C&I-related impact evaluations (historically piggybacking on Massachusetts work). **NMR** completed many residential lighting market assessment studies, which is a role they also have in Massachusetts. **Cadeo** led evaluations of the Income Eligible and Energy Wise programs, again programs they are familiar with from leading these evaluations in Massachusetts. Finally, **ILLUME** provided all Behavioral program evaluations and, for many years under a separate contract, led the Behavioral EM&V in Massachusetts.

**Table 4. EM&V Vendors and Study Examples**

Vendors	Study Examples
DNV GL	All C&I impact evaluations (coordinated with MA) Rhode Island Commercial and Industrial Market Characterization Data Collection Study Rhode Island Piggybacking Diagnostic Study
Tetra Tech	Commercial and Industrial Programs Free-Ridership and Spillover Studies
Cadeo	Impact Evaluation of Income Eligible Services Single Family Program Process Evaluation of Income Eligible Services Single Family Program Process and Impact Evaluation of Single-Family EnergyWise, Multifamily EnergyWise, and Income Eligible Services Multifamily Program Impact Evaluation of Home Energy Reports Program
NMR	National Grid Rhode Island Lighting Market Assessment - LED Saturation Survey National Grid Rhode Island Appliance Saturation Survey Report Rhode Island Baseline Study of Single-Family Residential New Construction Final 2017 UDRH Inputs for the Rhode Island Residential New Construction Program National Grid Rhode Island Lighting Market Assessment - 2017-2018 Sales Data Analysis National Grid Rhode Island Lighting Market Assessment - 2018 Shelf Survey Analysis Appliance Recycling Savings Update

Vendors	Study Examples
Research Into Action	HEAT Loan Assessment
ICF	Rhode Island 2017 Code vs. UDRH Study
Illume	Rhode Island Home Energy Report Program Impact and Process Evaluation Rhode Island Statewide Behavioral Evaluation: Savings Persistence Literature Review
Guidehouse (previously Navigant)	Rhode Island Customer Participation Study 2017 Residential Wi-Fi Thermostat DR Evaluation (coordinated with MA)
Cadmus	Heat Pump Study

#### 4.1.3.2 Implementation Vendors

National Grid contracts with many of the same implementation vendors in Rhode Island that they work with in Massachusetts. From interviews with National Grid staff, implementation vendors play a fairly passive role in evaluation. Specifically, they:

- **Participate in interviews as needed**
- **Respond to EM&V team questions related to program tracking data and details**
- **Integrate revised savings provided to them by the National Grid implementation team (from impact evaluations) to integrate into their planning assumptions**

Table 5. Implementation Vendors and Associate Program(s) (as of August 2020)

Implementation Vendors	Program
CLEARresult	Energy Star Homes/RNC Energy Star Homes/HEHE SF – Appliance Management C&I Upstream Lighting
RISE	EnergyWise SF EnergyWise MF Income Eligible MF C&I Small Business Initiative
Oracle (formerly OPower)	Behavior/Feedback Program
Lockheed Martin Services/TRC	Energy Star Lighting
ARCA	Energy Star Products
Energy Federation Inc.	Energy Star Products
Energy Solutions	C&I Electric and Gas HVAC
Leidos Inc.	C&I
Energy Source	LCI Retrofit

## 4.2 Energy Efficiency Program and EM&V Planning Process

Energy efficiency planning and implementation and EM&V are on a three-year cycle, and EM&V integrates in those planning cycles.

- **Three-year plan: Set three-year target and provides impact-related inputs for the benefit-cost model. Goals are **not** legally binding.**
- **Annual Program Plan: Establishes how will meet target for that year, adjusting for findings in subsequent years. Goals **are** legally binding.**
- **EM&V Planning Resides within the annual planning process, informing future Energy Efficiency plans. Savings targets for the next annual plan integrate impact evaluation results, and studies completed in 2020 will be used for the next three-year planning cycle (2021-2023).**

EM&V is an integral component to the Energy Efficiency planning process, both the annual and three-year plan. To illustrate using the 2019 annual Energy Efficiency Plan, EM&V activities from 2018 (and prior) needed to be finalized in sufficient time to be integrated into the 2019 Energy Efficiency Plan, submitted to the Rhode Island Public Utilities Commission on October 15, 2018. This means that those results needed to be vetted and finalized by August 2018. National Grid also uses the EM&V results to revise the TRM, submitted shortly after the Energy Efficiency Plan (October 22, 2018).

All the prior cycle's work culminates and feeds into the next three-year plan. The 2018-2020 cycle activities (including evaluation findings) will be used for the 2021-2023 evaluation plan. In prior years', National Grid submitted their three-year Energy Efficiency Plan in August prior to the beginning of the plan year. The timeline shifted back slightly for the 2021-2023 planning process, with the three year plan due in October 2020, along with the 2021 annual plan (see <http://rieermc.ri.gov/wp-content/uploads/2020/07/adjusted-timeline-for-eermc.pdf> for the detailed timeline).

### 4.2.1 EM&V Planning (and Implementation) Snapshot

EM&V Planning has evolved over recent years. What has remained consistent is that EM&V planning coordinates program planning, completed as part of the three-year and annual planning process. Below provides a snapshot of the general EM&V and implementation process. As a reminder, this study reviews processes retrospectively; any modifications to this process within the next cycle may not be captured in this summary.

**Multi-year strategic EM&V planning.** In the past years, National Grid worked with the OER and EERMC to determine EM&V needs annually. There did not seem to be a consistent approach for determining evaluation needs. More recently, National Grid began systemically reviewing EM&V activities by program across time to ensure all programs are being evaluated. The multi-year planning process

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also allows the team to prepare for procurement and funding. The goal is to evaluate every major program once in a cycle and evaluate the Custom program every year on a rolling basis (one-third completed each year). Measures where markets are rapidly shifting (such as lighting) or of interest (such as heat pumps) received heightened focus, requiring market studies and evaluations.

**Annual EM&V planning (and implementation).** In the spring and summer of each year, National Grid meets internally with their team as well as stakeholders to plan for EM&V studies in the following year. They specify the studies to be completed in that year, yet leave room for EM&V vendors to modify the plan as needed.

Steps National Grid goes through as part of the annual EM&V planning process are as follows:

- **Identify programs / measures that have not been evaluated. Also identify where Rhode Island could collaborate with Massachusetts studies.**
- **Work with strategy and implementation teams to determine program needs, studies to be completed, and budget allocations. In planning studies, they consider:**
  - **Proportion of savings represented in the portfolio of programs**
  - **Time since last evaluation completed**
  - **Evaluation budget, which is relatively low given Rhode Island is a small stage (with lower implementation budgets)**
  - **Uncertainty on savings values (want planning to be as accurate as possible, especially when moving into the 3-year planning process)**
  - **Major program changes**
- **Scope studies at a high-level, sufficient for engaging EM&V contractors**
- **Discuss with the oversight team (ERMC consultants and OER) on study specifications**
- **Finalize list of studies and associated budgets**

Below is a general snapshot of the EM&V scoping and implementation process, primarily reflecting how a residential study might operate.

### Annual EM&V Process: General Snapshot

January – February Procure and contract with EM&V contractor

February 2019 Submit EM&V workplan

March 2019 Finalize EM&V plan

April 2019 – June 2019 Conduct impact evaluation

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April 2019 – July 2019	Conduct process evaluation
July 15, 2019	Submit impact evaluation reports
July 31, 2019	Submit process evaluation reports
August 30, 2019	Finalize impact and process evaluation reports
September	Integrate findings in annual plan Update measure impacts for cost-effectiveness tests Integrate impacts into TRM

Many studies will deviate from this timeline, some significantly, primarily on the C&I side. C&I studies experience significant lags from program implementation to evaluation and reporting. At the time of the interviews there was one program where the evaluation team just finished completing site visits from customers from program year 2016.

### 4.2.2 Budgeting EM&V

National Grid determines a target budget for each study planned for that year. The sum of those study budgets determine the annual EM&V budget. Budgets dedicated to EM&V, according to interviews, averages 2%, which equates to about \$2M-\$3M annually.

The budget for 2020 EM&V activities were higher than other years as there were considerably more studies completed compared to prior years in an effort to plan for the next cycle. The 2020 Evaluation, Measurement, and Verification Plan, filed as part of the 2020 Energy Efficiency Program Plan, estimated dedicating \$3.2 million to complete evaluations in 2020, accounting for approximately 2% of the total portfolio budget. In total, this budget included about 23 evaluations, some of which could be coordinated (i.e., EnergyWise process and impact evaluations). Of these, only three studies were to be coordinated with Massachusetts (C&I Custom Impact, C&I Upstream Lighting Impact, and Residential Upstream Lighting Market Assessment, <http://rieermc.ri.gov/wp-content/uploads/2019/11/ngrid-ri-2020-annual-ee-plan.pdf>, page 78)

Lower budget allocations were feasible given decisions to leverage Massachusetts studies, as described below.

## 4.3 EM&V Procurement

EM&V vendors are procured in three ways:

- 1) **through Massachusetts contract relationships**
- 2) **sole sourced based on prior experience with EM&V vendor**
- 3) **competitive bid and selection**

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Review of studies completed and discussions with National Grid and evaluation staff identified the following procurement patterns:

- **Residential evaluations are typically procured through a competitive solicitation process**
- **Market-related studies (also referred to in documentation as cross-cutting) are a mix between sole sourced, piggy-backed with Massachusetts, or procured through a competitive solicitation process**

Several interviewees outside of National Grid staff noted that there is lack of clarity on how and when studies are competitively bid out versus sole sourced. Interviews completed throughout this process did not uncover a systematic process for these decisions either.

EM&V budgets are tied to the annual plan. As a result of the annual planning, there were studies where the procurement process does not start until January. The process took time, pushing back EM&V kick-off to well into the spring, and limiting the time for implementing EM&V activities.

Interviews with National Grid and EM&V vendors identified that it would be ideal to find a process where EM&V can kick-off early January rather than starting to procure contracts at that point. As of this reporting, National Grid is addressing this workflow need by contracting with a vendor to provide residential program EM&V services throughout the next three-year energy efficiency plan cycle (2021-2023). Having this vendor onboard across multiple years will allow the vendor to engage in the EM&V process year-round, allowing the vendor to begin the EM&V process earlier and elongate the time available to complete evaluation.

### 4.4 EM&V Implementation

At the completion and approval of detailed plans, EM&V contractors implement the study, following the structure, timeline, and deliverables outlined within the approved plan. General activities completed as part of EM&V implementation include the following. This section also includes observations related to C&I studies and integration of implementation vendors in EM&V.

**Interviews with National Grid staff and implementation vendors.** With some exceptions, evaluations generally kick off with interviews with the program team. This could take place before or after planning, and typically include a discussion about program activities, priorities, and nuances, and investigate specific issues that could affect the evaluation process.

**Information and data request and review.** All evaluation studies leverage some type of data, including customer data, participant records, vendor information, and data from past market and research studies. Evaluation studies may also heavily reference materials useful for review, such as application materials, project documentation, and program and marketing collateral. The EM&V team requests, organizes, reviews, and reports back on the sufficiency and need for additional data, often working

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with National Grid staff and implementation vendors. National Grid takes data security seriously, and their EM&V contractors have to go through a rigorous data security clearance check as part of the contracting process.

**Data collection.** Depending on the study, data collection can take many forms, and studies can include multiple forms of data collection. The types of data collection can include, but are not limited to surveys, interviews, on-site measurement and/or verification, as well as data collected through secondary research. For most primary research, the evaluation team takes the following steps:

- ▶ Develops sampling plan and completes sampling
- ▶ Develops instruments and supporting documentation (e.g., advanced notifications, information for the call center)
- ▶ Conduct research and gather data
- ▶ Clean and organize information for analysis

Because of the importance of data collection for the study, and ensuring the right questions are asked of the right individuals, the right way to most validly represent program activities, this stage of the process requires considerable review and oversight. Specifically, National Grid will most likely review materials first, followed by EERMC and potentially OER review and approval.

**Analysis.** The final step in EM&V study implementation (outside of reporting) is analysis. Data collection and research studies may include an analysis plan that lays out how the analysis would be conducted. The plan may lay out: how data will be integrated, weighted, and consolidated for analysis and reporting; how specific survey data are used to calculate critical impact values (such as net-to-gross) and data verification procedures.

The interviews and surveys revealed challenges to C&I studies, and opportunities for implementation vendor engagement in the EM&V process. Below describes these two issues.

### 4.4.1 Implementation challenges identified related to C&I studies

Interviews across many stakeholders, and review of C&I EM&V report timelines, identified the following challenges relates to C&I studies.

#### Cost and Limited Sample for On-sites

Following Massachusetts' model, high rigor dictates that impact evaluations are primarily completed through on-site visits. On-site visits are most accurate at the site-level, but expensive. They also take time and, for some programs, require longer-term metering, which delays finalization of results.

Rhode Island is a much smaller state than Massachusetts and has significantly lower energy efficiency program budgets and, relatedly, fewer participants in a given year. This translates to fewer on-site

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visits which may not be sufficient to meet an appropriate level of precision for the evaluation results, given current expectations for the level of rigor.

As Rhode Island moves toward a model where they are moving toward Rhode Island specific data (versus piggybacking on Massachusetts), it may be necessary to consider prioritizing measures or programs that rely on on-site visits, and use alternate methods (e.g., engineering analysis) for non-prioritized measures or programs. National Grid plans to increase the number of on-sites for RI and conduct these on-sites through a rolling sampling approach, determining realization rates using a three year rolling average of site results. Doing so grants less granular results in a given year, but is balanced by the benefit of being Rhode Island specific.

### Timeliness of EM&V and Reporting

Also following the Massachusetts model, and a result of piggybacking of that EM&V framework, C&I study results can lag considerably from participation to EM&V reporting. According to interviews with the C&I evaluators and National Grid staff, delays are primarily driven by two things: 1) needing to wait for full year participation and finalized reported energy savings for data to be available for sampling (typically by June of the following year) and 2) weather-sensitive measures that warrant cross-seasonal and longer-term measurement.

*In this model, there can be up to a three-year lag from participation to final reporting, and significant lag in planning application of results, to illustrate:*

- **Program year: 2018**
- **Participation data available for EM&V: June 2019**
- **Sample planning, recruiting, on-site measurement, analysis and reporting (approximately six months to one year): July 2019 – July 2020**
- **Program year application: 2021 National Grid also needs to identify and reconcile the delayed C&I impact results. Prospectively applying participant impacts many years prior – as far back as the prior three-year cycle - is not a timely application and may result in less accurate planning.**

Rhode Island is moving toward a higher incidence of independent measurement and verification of C&I projects within Rhode Island. Specifically, the state is moving toward developing samples independent of Massachusetts. For C&I projects, National Grid plans to use a rolling sampling and data collection process, where they will sample, collect data annually, and analyze results annually, but present results (including confidence and precision) within a three-year rolling period (basing final impacts on a 3-year period versus one-year period), or within a shorter rolling period if the target confidence and precision is achieved (e.g., achieved within two years, then using a two-year rolling average).

#### 4.4.2 Implementation Vendors' Experiences with EM&V

Implementation vendors contracted by National Grid to implement the programs have energy saving and cost-effectiveness targets. They are also fundamentally responsible for successful delivery of National Grid's programs. For these reasons, they are an important stakeholder in the process.

Implementers report varying levels of engagement with and exposure to the evaluation process. Below describes their engagement with the various stages of evaluation.

**EM&V planning:** some implementers reported being asked about what they perceive to be important research needs for the evaluation, whereas others were not tapped for this information. (However, implementers report participating in interviews with the EM&V team, which may capture their needs and perspectives when completing detailed planning.)

**Data and information request.** All implementers said they respond to data and information requests, and that the requests are reasonable, both in terms of information and timeline.

**Data collection.** Implementers may be engaged in reviewing data collection. As part of data collection, many implementers reported connecting evaluators with customers as needed.

**Reporting.** All implementation vendors, except one, report meeting with National Grid staff to discuss the evaluation results. The evaluation vendors are not typically included in those meetings, and results are often shared when final.

**Application of results.** Most implementers, while fairly removed from the evaluation process, do report working collaboratively with National Grid to update the savings for program measures, which then directly feed into their next annual planning process.

Implementation vendors saw value from the evaluations, specifically:

- 1) **Third party review is important to monitor savings and examine how programs are operating and customers are served to ensure rate payer funds are being used appropriately.**
- 2) **There is value to receiving feedback and recommendations to inform future project design.**

Implementation vendors also offered up the following suggestions for consideration related to the evaluation process. Note that many of these comments are singular, mentioned by individual vendors.

- **Provide impact evaluation results before finalizing plans of the upcoming program year.**
- **Increase transparency and information related to customer feedback (referenced in general, but could include feedback related to their performance).**

- **Accelerate the timeframe for receiving evaluation results so that program adjustments can be made in a timely manner. This respondent noted that evaluations often take 24 months from planning to reporting, if not more.**
- **Continue to involve implementation vendors at every stage of the evaluation process, including the development and review of draft findings. This can be done without compromising the independence of the evaluation. Several implementation vendors mentioned wanting increased engagement, one of whom mentioned that it would help them support evaluation better.**

Integration and collaboration with key stakeholders engaged in energy efficiency is a best practice. Our team finds it is not uncommon for implementation vendors to be brought into the review process, or in direct communication with evaluators throughout the reporting stage. Cases where the BrightLine team has more interaction with vendors are often utilities and states where vendors have a more active role in the programs, are responsible end-to-end for program planning and design as well as delivery. Unlike some of these other states, National Grid Rhode Island heavily relies on their internal implementation team to do this work, hiring implementation vendors to carry out their plan (versus providing turnkey services), so the same level of vendor feedback, though important may be less valuable.

## 4.5 Reporting

Fundamentally, reporting for each study is critical for the next year's planning efforts. Impacts are applied prospectively. Savings values used in the B/C model will be the same as those used in estimating impacts. And process recommendations are, to the extent possible, integrated through program design or delivery changes.

The reporting process is iterative. Because it involves stakeholders, it is not uncommon to have multiple (as many as three to four as outlined below) drafts and can take a minimum of a month to go through the review process. Note that while this illustration focuses on reporting, the review process of most other work products (or deliverables) follows a similar process, albeit within a potentially shorter timeline depending on the length or complexity of the deliverable.

- ▶ **Draft 1:** Send to National Grid for review and feedback
- ▶ **Draft 2:** Respond to National Grid feedback and send to EERMC consultants and OER for review and feedback
- ▶ **Draft 3:** Respond to EERMC consultants and OER feedback for final review
- ▶ **Final Draft:** For final review
- ▶ **Final Report Delivered and Publicly Available on EERMC website**

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The level of scrutiny on the EM&V reports and results is high. This leads to a report review process that some state is extensive, thorough, and detailed. Depending on the report, it often includes perspectives of multiple EERMC consultants, organized by the EERMC consultant team lead. While this level of scrutiny improves quality and rigor, it is not necessarily accounted for in the budget or amount of time available to complete the studies.

Evaluation reports are traditionally very lengthy as it is necessary to not only draw out the key conclusions and recommendations, but also provide sufficient supporting details and evidence to support those points. National Grid Rhode Island's EM&V reports are no exception, commonly exceeding 100 pages in length between the executive summary, key findings, site reports and any necessary appendices.

At a time when internal and external stakeholders (including consumers) are faced with increasing demands and level of information and messaging, there is a movement within and outside the industry to convey information more succinctly and visually. Following this trend, in recent years, stakeholders including the OER have requested abbreviated and visual one-to-two-page executive summaries accompany EM&V reports. One EM&V vendor interviewed said they went through this process at the time of this study, noting that going through that process was valuable to ensure the information conveyed was on-point and focused to what was most important.

Based on our experiences, the Brightline team will note that it does take time and technical capabilities to be able to do graphical executive summaries well, ensuring it conveys the right level of information to describe and contextualize results. Further, it requires that everyone aligns on the most critical key take-aways prior to the development of the summary, oftentimes requiring additional rounds of reviews. But from our perspective, with the right resources having abbreviated visual summaries is an effective and important means for imparting information to varying stakeholders.

### 4.6 Working Well and Challenges

Interviews, on conclusion, dug into two questions of high interest to the study: *What is working well?* and *Where can the evaluation process be improved?* The point discussed below highlights the specific responses to these questions. Note that these are not the only areas identified throughout this study; rather, specific areas that were on top of minds for those stakeholders interviewed.

Related to working well, stakeholder engagement, oversight, and the collaborative relationships were high points within Rhode Island's EM&V structure. Comments provided include:

- **"Evaluators are very receptive for feedback. We know that a lot of times we provide a lot of feedback. And National Grid as well, they do a good job being responsive to the feedback"**
- **"Stakeholder engagement is efficient."**

- **“There’s a good collaborative process.”**

Quality and confidence in results, and application of those results to planning, was also an area that received positive feedback.

- **“Honestly, the rigor of evaluation that has been done has been really good.”**
- **“[I think] updating [impacts] annually [is] increasing reporting accuracy, especially for lighting where market transformation is taking place.”**

Areas for improvement centered around two areas: communication and timelines for evaluation and reporting. Several items arose related to communication, both one-off comments yet worthwhile to include in this report. The first is highlighting to external stakeholders (those not closely involved in planning or EM&V) how EM&V results are important and have been applied. Doing so impresses the value and importance of EM&V throughout the lifecycle of energy efficient programs.

Second is when evaluation results are integrated into the benefit-cost model. Several interviewees raised the concern that National Grid seems to hold on running benefit-cost models for the end of the evaluation period, feeling there could be opportunities to update those models earlier. These interviewees feel that there is opportunity to run those models and communicate results earlier to engage in conversations earlier *“so we’re not debating [the results or values] at the time of the plan.”*

Finally, many interviewed noted the EM&V timeline is not ideal. Either it is taking too much time to finalize results (as in the case for C&I) or they feel there is not enough time to complete the research. From the perspective of National Grid staff, the need to plan and evaluate concurrently spreads the team thin. Absent refining the application of EM&V results (such as having them lag a year), the only solution is finding means to extend the timeline for implementing evaluation, which as reported throughout National Grid is working to achieve through revised contracting (specifically, with the residential EM&V vendor).

## 5 Lessons Learned from Other States

The BrightLine team interviewed representatives from seven states outside of Rhode Island. These interviews were informal and focused on gathering interviewee perspectives on their EM&V process in the following areas:

- ▶ Planning cycle (programming and EM&V)
- ▶ EM&V structure, including procurement and stakeholder integration
- ▶ What works well they would consider a best practice
- ▶ Challenges they encounter that could inform better or best practices

The following sections provides brief summaries for each state interviewed. Note that these interviews (and, subsequently, the summaries) were not all-encompassing; meaning, there are a host of EM&V issues – contextual, process, and otherwise – that did not bear out in the interviews. Further, the views represent a single interviewee, and may not be reflective of all perspectives related to the EM&V processes in that state. However, they provide some insight into unique state-level issues to provide some comparison with Rhode Island activities.

Rhode Island is unique from other states interviewed in a number of ways, most notably how they contract evaluation, plan for evaluation, and integrate evaluation results. Table 1 provides a snapshot of current evaluation practices for each of the stakeholders we interviewed. In most states, stakeholders create multi-year plans, ranging from two to four years and conduct evaluations throughout that period following a fairly prescribed multi-year EM&V plan. Some states conduct annual portfolio-level impact evaluations with set evaluation contractors, while others conduct impact evaluations on an ad-hoc basis depending on the goals laid out in their multi-year plan.

Based on our assessment of these interviews, a portfolio-level impact evaluation with pre-determined evaluation contractors is a successful model when annual impact evaluations are required by the state. Other evaluation and planning models can work well when annual impact evaluations are not required by certain dates or when stakeholders have different goals for their evaluations.

Table 1. Summary of Statewide Evaluation Processes

State	Planning cycle	Reporting Savings Results	Evaluator Selection and Contracting	Use of evaluation results	Relevant notes
Massachusetts	3-year	Ad hoc when evaluations are completed, but ideally aligning with annual plan	Selected vendors contracted for multiple years by "sector" or study type	Retrospective for all impact evaluation results except NTG, which is prospective for the next three-year plan	Highly integrated and collaborative, set roles and structure for scoping and reporting
Wisconsin	4-year	Portfolio-level annually	Selected vendor contracted for multiple years	Prospective	Highly integrated and collaborative, set roles and structure for scoping and reporting
Maryland	3-year	Ad hoc when evaluations are completed	Selected vendor contracted for multiple years	Prospective	Streamlined reporting, established evaluator helps facilitate scoping.
Vermont	3-year	Portfolio-level annually	Selected by DPS, different contractors for different programs	Retrospective	Impact evaluations are simple and fast desk reviews and not based on longer term metering or data collection
Illinois	4-year	Portfolio-level annually	Pre-selected by each utility, contracted for 4 years	Prospective	Compressed timeline limits scope, pre-selected evaluator helps limit ramp up period
Oregon	2-year	Ad hoc when evaluations are completed	Selected by RFP for each evaluation	Prospective	Using contractors for each evaluation expands timeline, projects are scoped to be deep evaluations
Connecticut	3-year	Ad hoc when evaluations are completed	Selected by evaluation coordinator for each evaluation	Prospective	Evaluation coordinator manages complexity, if timelines are missed plans cannot be updated

## 5.1 Massachusetts

**What they do.** MA program administrators use a 3-year plan where they choose EM&V contractors for that 3-year plan. Contractors scope studies described in the three-year plan or scope individual studies as requested by the program administrators. When conducting impact studies, timing and use of the results depend on the rigor of the study. Massachusetts attempts to complete impact related studies to integrate results within the annual reporting process, although oftentimes – and especially for C&I research – studies are not completed in time to be integrated in annual planning. Massachusetts and their oversight group (Energy Efficiency Advisory Council, EEAC) have been working toward timelier C&I evaluations as MA does have filing deadlines that are the point of no return for studies to be used in the subsequent annual plan. MA program administrators are invested and engaged in the EM&V studies, which means contractors can expect a high level of engagement and quick turn arounds on questions and access to data. The high level of engagement and need for review across multiple PAs and EM&V oversight does mean that there are many people that need to give approval for a project, and buy-in across all PAs can, at times, be challenging.

**What works.** Overall, MA is able to get studies scoped, conducted and filed fairly fluidly across the three-year cycle using pre-approved contractors and high engagement across all stakeholders. MA PAs have established a system of scoping, conducting and reviewing evaluations that allows for input of stakeholders while still maintaining adherence to the roles of each stakeholder.

**Challenges.** MA has many stakeholders reviewing and approving each project, and while the system they have set up works well and results in high-rigor research, the extensive review and approval process can take time and lead to inefficiencies.

## 5.2 Wisconsin

**What they do.** Wisconsin uses a four-year planning cycle where they put together a strategic plan that maps out their priorities, goals, teams, staff and implementers. Evaluators are included in the planning process as well to identify trends that planners should be aware of. Annually, they create a business plan showing progress towards strategic goals and what program will be implemented and what the budgets will be for that year. These plans are shared with the evaluator to kickstart the evaluation planning process. For this process, planners will put together information about the programs. In response, evaluators create proposals of how they would evaluate that program. This process is open and iterative, and as such, if program staff are unsure whether an evaluation activity would help improve the program, program and evaluation staff discuss what would be helpful. Final evaluation results tend to be available after the first quarter of the year and are therefore not used by program planners until the subsequent year. However, once the reports are published, implementers are required to complete evaluation response plans where they respond to key findings.

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Impacts are updated annually, and implementers take the information from the evaluation and update energy savings achievements and potential achievement prospectively for the following year. The timeline is functional but can feel busy before an evaluation is published. To ease implementation of changes, evaluators deliver an impact workbook that provides granular information on the measures evaluated, so all stakeholders can see how the evaluation findings impact savings.

They have been able to cultivate very good relationships across staff, implementers, and evaluators that fosters open discussion. Having a strategic evaluation plan has helped foster these relationships.

**What works.** Wisconsin uses a known evaluation contractor during their quadrennial cycle, and by using a strategic plan, has created a system that integrates feedback from staff, implementers and evaluators. Annual impact evaluations are finished by the end of April to ensure results inform the subsequent year's planning estimates.

**Challenges.** To finalize evaluations by the end of April, evaluators have found there is a time crunch prior to finalizing the results. However, Wisconsin has stuck to the end of April deadline because impact results require changes in the data systems, the TRM, and planning around measures already in the field and current contracts. This deadline allows for a reprieve so they can plan for the next year based on the evaluation results.

### 5.3 Maryland

**What they do.** Maryland uses a three-year planning and evaluation cycle. Maryland utilities work together to contract out the evaluations and have a set portfolio evaluator for that planning cycle. They require certain evaluation activities to be conducted to be compliant with the state evaluation guidance. Outside of those required activities, Maryland utilities start by prioritizing a list of special studies per planning cycle. This process is not formalized, and any stakeholder can raise a topic for study. Ultimately, in a highly collaborative fashion, the utilities and the evaluator decide what will be done that year. While Maryland has an evaluation oversight consultant that helps ensure quality evaluations and answers to the commission, utilities and evaluators drive the decisions on what gets evaluated that year.

Maryland has created a streamlined reporting structure with each evaluation consisting of 10 pages or less, including results, recommendations, and any deviations from the methods outlined in the planning documents. They also allow special reports when more detail is needed.

**What works.** There is a high degree of trust between the evaluators and Maryland utilities, that allows for a free exchange of ideas that facilitates prioritizing which evaluations will be conducted during that cycle. Because the evaluation team is set, they work with the utilities and oversight consultant to scope evaluations efficiently.

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**Challenges.** It would be helpful to clarify roles on who can provide input and the timing of that input, to help draw clear boundaries for each stakeholder.

In order to enable deeper studies while ensuring that all programs are evaluated, some stakeholders would like to match the level of rigor with the level of importance of a program or measure. This would allow all programs and measures to be evaluated, but also allow more focus on important programs and measures.

### 5.4 Vermont

**What they do.** Vermont uses a 3-year planning cycle with annual evaluations kicking off in February of that year. Evaluations are typically only savings verifications using engineering reviews but there are a few broader projects, like market characterizations or deeper impact evaluations for new or uncertain measures. As evaluations are finalized, findings are rolled directly into the program, and savings are applied usually in that year - retrospectively. However, for prescriptive measures in the TRM, where the evaluation results are very different from those assumed in the TRM, the utility will generate a new set of assumptions and use them prospectively. Vermont's Department of Public Service (DPS) manages all evaluation work for the utilities. Utilities can review RFPs, scoping documents, and goals. Vermont utilities work collaboratively with DPS and evaluators but expect evaluators to be independent. Utilities do have regular meetings with evaluators and are able to ask questions and communicate what they want to get out of the evaluations. Vermont uses different evaluation contractors for different projects and activities and interacting with the various contractors can sometimes lead to confusion. Stakeholders often must clarify roles and scope because one firm conducts the evaluation while another firm discusses how to apply the evaluation results. Vermont does not have a large evaluation budget, so they are aware that there are some things they cannot do when they compare themselves to other states like MA, but they do take note of what others do.

**What works.** Simple, less rigorous evaluations allow for Vermont to implement results retrospectively for most of their evaluations. Stakeholders have fostered an environment of collaboration so utilities feel they can bring forward ideas and suggestions.

**Challenges.** Different evaluation contractors can lead to confusion over roles and scope. Smaller budgets mean they cannot always match methods with states like MA.

### 5.5 Illinois

**What they do.** Evaluation contracts run on a four-year cycle, as do implementation contracts. All evaluation reports must be delivered by April 30<sup>th</sup>. Evaluators conduct impact evaluations on all programs annually and NTG process evaluations run bi-annually or once a cycle in the fall. Each utility selects their own evaluators for the duration of the cycle. All communications from the evaluator to the implementation contractor must go through the utility. Evaluators never talk independently with implementation contractors as Illinois wants to keep evaluation independent. Evaluation results are

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applied prospectively to help utilities plan accurately. The timeframe for the evaluations is aggressive, usually running from January to April.

**What works.** Illinois' collaborative environment helps ensure that stakeholders agree on evaluation topics. Having a set evaluation contractor for the cycle allows the contractor to start evaluations as soon as the new year begins.

**Challenges.** Even with a set evaluation contractor, the timeline for evaluations is compressed. Annual impact evaluations for every program restricts funds for deeper, more thoughtful evaluations.

### 5.6 Oregon

**What they do.** Oregon state energy efficiency programs are run through either Energy Trust of Oregon, focusing on resource acquisition programs, the Northwest Energy Efficiency Alliance, focusing on market transformation initiatives, or the Bonneville Power Authority, focusing on market-level research. As such, Oregon's efficiency programs and the resulting evaluations are different from other states. Energy Trust of Oregon's evaluation practices are most relevant for comparison for this study.

Energy Trust of Oregon has a two-year cycle and bids out work by program rather than at the portfolio level. This leads to a known ramp up period getting the evaluator up to speed on the programs and process. Energy Trust chooses certain programs to be evaluated during the year based on the needs they identify in the two-year plan or as they come up during program implementation. Stakeholders work collaboratively to choose which programs to evaluate. Using this approach, Energy Trust works to avoid widget counting and conducting evaluations that are not useful to stakeholders.

**What works.** Collaborative approach helps prioritize programs for evaluation and focus evaluations so they are useful.

**Challenges.** Using individual evaluation contractors for each program leads to a known ramp up period for the contractor.

### 5.7 Connecticut

**What they do.** Connecticut has a three-year planning cycle. Connecticut uses a statewide evaluation administrator that creates the evaluation plan for the three-year cycle and coordinates the evaluation consultants, running the RFP and hiring process. Connecticut DEEP also has someone who oversees the evaluation administrator. The three-year evaluation plans, RFPs, and hiring must be approved by an advisory board. Each utility in Connecticut submits a three-year plan and updates it annually for approval by the board. Impact evaluations typically have cut off dates where they can be used in an updated plan, but there are times when evaluations do not meet the cutoff date. According to the interviewee, Connecticut is trying to align more with MA but are limited by a smaller evaluation

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budget. There are some programs that run in Connecticut that are very similar to those in MA which may allow for joint evaluations.

**What works.** A coordinated evaluation administrator attempts to streamline the planning, RFP and hiring process and integrate feedback.

**Challenges.** Coordinated evaluations also have the potential to create inefficiencies and inhibit timely evaluations. Additionally, when evaluators cannot make the cutoff date for evaluation results, utilities cannot update their annual plans, leading to frustration.

### 5.8 Conclusion / Summary

Each state interviewed is unique and has their own structures and policies that work. Like Rhode Island, many states have an oversight group, which they recognize is valuable for strengthening the results and ensuring results are defensible. Also, much like Rhode Island, states are often working against annual plans to inform savings and processes for future program years, which can feel limiting and result in surface-level insights when strictly adhered to. Unlike Rhode Island, most of these states contract with evaluation teams across multiple years. The states that do not do this (e.g., Oregon) note that the EM&V contracting process is not ideal.

## 6 Summary and Conclusions

Following presents the key conclusions by key research question topic:

- 1) **Does Rhode Island’s current EM&V process comply with best practices for programs in its size and scope?**
- 2) **What process-related EM&V challenges does Rhode Island experience?**
- 3) **What opportunities exist to improve the EM&V process?**

### 6.1 Does Rhode Island’s current EM&V process comply with national industry best practices for programs in its size and scope?

There is no one definition of EM&V best practices. However, interviews and literature point to a common set of EM&V attributes that many jurisdictions constitute effective, if not best, practices for setting both EM&V and energy efficiency programming up for success. These include:

- ▶ Independent yet collaborative
- ▶ Direct and expedient application of results
- ▶ Timely, with evaluation activities and reporting, closely following (or even embedded throughout) program delivery
- ▶ Strategic planning with flexibility to be responsive to program and stakeholder needs
- ▶ Sufficiently funded to meet EM&V requirements and rigor
- ▶ Transparent reporting
- ▶ Comprehensive (collectively considers effective program processes, resulting impacts on energy use, and market analysis)
- ▶ Defensible approaches such as those defined in the Uniform Methods Project and International Performance Measurement and Verification Protocols

National Grid Rhode Island follows many [EM&V best practices](#): Below highlights many of the best practices identified and BrightLine team’s findings related to National Grid Rhode Island’s activities related to the practices.

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**PRACTICES**

**BRIGHTLINE TEAM INSIGHT**

**Independent yet collaborative**

**Exhibit best practice; EM&V practices are independent yet highly collaborative.** Accessible, responsive, and invested National Grid staff throughout the EM&V process. There’s a collaborative stakeholder process, including active EM&V oversight through independent Energy Efficiency Resource Management Council (EERMC) consultants, which interviewees believe strengthens the studies and confidence in results.

**Strategically planned with flexibility**

**Exhibit best practice, with opportunities for continued refinement.** New this cycle, National Grid developed a longitudinally focused matrix of EM&V studies and used that to plan EM&V studies to ensure each program is evaluated at least once within a three-year energy efficiency plan cycle with a focus on high-interest and high-impact measures. Flexibility is realized through the annual EM&V process where priorities and perspectives of primary stakeholders (OER, EERMC, National Grid program managers) may shift the plan. *There is value to drafting a preliminary three-year EM&V plan of studies within the three-year Energy Efficiency Plan.*

**Prioritized activities**

**Exhibits best practice with opportunities for “right-sizing” and embedded research.** Concerted effort to verify savings of larger saving programs and measures based on primary, facility-specific data through onsite visits (primarily C&I) or billing analysis. Continue ongoing efforts to differentiate and codify evaluation needs for pilot, assessment, and demonstration efforts which may require prioritization and resources to inform program design and feasibility for expansion into the portfolio of approved energy efficiency programs (as documented in *2021 Pilots Demonstrations, and Assessments* filed as part of the Annual Energy Efficiency Plan for 2021<sup>10</sup>).

**Balanced (process, impact, market)**

**Exhibits best practice with residential programs, with opportunities to be more comprehensive with C&I initiatives.** Inclusion of cross-cutting market-based research to inform baselines, naturally occurring activities, and program opportunities. Residential evaluations include process and impact evaluations. However, C&I evaluations have been impact only; there has been no process evaluation of the C&I programs.

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<sup>10</sup> [rieermc.ri.gov/wp-content/uploads/2020/08/first-draft-2021-annual-energy-efficiency-plan.pdf](http://rieermc.ri.gov/wp-content/uploads/2020/08/first-draft-2021-annual-energy-efficiency-plan.pdf)

**PRACTICES**

**BRIGHTLINE TEAM INSIGHT**

**Defensible approaches**

**Exhibits best practices.** EM&V activities reference and follow industry-recognized guidance documents, such as State and Local Energy Efficiency Action Network impact evaluation protocols and International Performance Measurement and Verification Protocols. EERMC Consultants and OER provide additional layer of oversight and guidance to safeguard methodologies and results are defensible.

**Sufficiently funded to meet desired EM&V rigor**

**Exhibits with opportunities given desired rigor, level of EM&V oversight, market-focused studies, and program expenditures.** Funding is from \$2M-\$3M annually, which represents approximately 2% of program implementation budget. To-date, this level of funding has been sufficient as National Grid Rhode Island piggybacked on Massachusetts studies. Increasing number of Rhode Island specific samples, and reducing level of piggy-backing efforts, may require more strategic planning and potentially funding.

**Timely, with evaluation activities closely following program delivery**

**Exhibits best practice for residential and cross-cutting studies, with opportunities for improvement for C&I.** Residential and market effects studies are integrated into the planning process as soon as completed, sometimes within 4 months of contracting. Commercial impact evaluations have significant lag time, where these evaluation studies typically wait for full program year to be completed to begin sampling, and primarily rely on time intensive on-sites to verify impacts. *There is opportunity to consider shifting evaluation closer to project completion and using other less time intensive methods to verify impacts, especially for C&I evaluations which delay considerably.*

**Transparent reporting**

**Exhibits best practice with opportunities.** Review of EM&V reports show transparency in methodology and study limitations. The EERMC oversight also impresses and requires transparency through the review process. The BrightLine team only identified one area for possible improvement: residential EM&V reports do not consistently report confidence and precision around impact evaluation point estimates, an area identified for improvement.

**Direct and expedient application of results**

**Exhibits best practice; there is direct and quick application of results once finalized.** With the prospective, direct, and near real-time integration of EM&V results into annual program planning. With that said, C&I evaluation results are considerably delayed and provide results for program planning up to several years after implementation.

## 6.2 What process-related EM&V challenges does Rhode Island experience?

Rhode Island experiences the following *process-related EM&V challenges*:

- ▶ **Annual EM&V contracting.** Unlike most states interviewed, National Grid Rhode Island contracts annually for some EM&V studies, contracting with different EM&V vendors, and through a mix of sole source and competitive bid processes. This practice was inefficient and time consuming for National Grid staff, limits the ability to include EM&V vendor feedback into the planning and budgeting process, and limits flexibility gained through contracting with a team of contractors across multiple years. National Grid is working to reduce this workflow issue, and moving to multi-year contracts, as evidenced with their recent residential program EM&V contract which will be in effect for the 2021 – 2023 energy efficiency plan cycle.
- ▶ **EM&V implementation and reporting timeline is challenging, primarily affecting some residential EM&V studies to-date.** When contracted in the same year, EM&V implementation is often compressed into a short timeline, book-ended by bid and procurement processes and annual reporting needs. It is not unusual for a residential study to be contracted and completed (with results and reporting finalized) within four to five months. While the timeframe is known and generally met by EM&V contractors, it puts strain on the EM&V process, particularly analysis and critical review process, as well as on staff.
- ▶ **C&I impact results are often applied multiple years after participation.** On the other end of the spectrum, finalizing C&I program evaluations traditionally lagged considerably behind the relevant program year. As one example, a C&I custom evaluation report, based on 2016 projects, was finalized in 2019 and integrated in 2020 planning.
- ▶ **National Grid EM&V staff are often spread thin.** They provide critical EM&V oversight across multiple states which alone can be challenging. However, their nearly concurrent and overlapping responsibilities for EM&V review and rigorous annual program planning process is resource intense, often requiring extensive working hours.
- ▶ **Timeline and EM&V funding may not account for the oversight process.** EERMC consultant oversight is a positive from all perspectives, and their level of oversight is generally reasonable. Interviewees noted that the structure of oversight evolved (and in many ways) improved over the past few years. However, extensive feedback and proactive stakeholder integration into the EM&V process, which is important, is not always accounted for in the EM&V timeline and budget.

### 6.3 What opportunities exist to improve the EM&V process?

All of the above factors combined raise the following higher priority *EM&V opportunities* for National Grid, OER, and stakeholder consideration:

**EM&V Planning:** The following opportunities exist for EM&V planning.

- ▶ Draft a strategic, preliminary three-year EM&V plan of studies within the three-year Energy Efficiency Plan. Document EM&V expectations for studies (e.g., rigor, confidence and precision, prioritization, funding levels, evaluation level and type within a 3-year cycle). Build from the systems in place (primarily the EM&V study tracker developed by National Grid) to document, at minimum, when the study will be completed and level of effort or rigor (such as through a dollar allocation range). Because this is a strategic plan it should be flexible based on changing needs and priorities.
- ▶ Make sure to build in budget for ad-hoc market or other studies.
- ▶ In annual planning, continue to strategically consider high-priority high-impact high-budget needs and, conversely, where less costly approaches can be taken. Not all measures require high-impact approaches (on-site visits).
- ▶ When setting EM&V funding, consider reasonableness given Rhode Island's EM&V rigor standards and the fact that there is active EM&V oversight through the EERMC. Increasing Rhode Island samples and state-specific research may warrant additional EM&V funding as a percentage of implementation and/or additional trade-off analysis between number of studies, rigor, and cost.

**EM&V Implementation:** The study found the following opportunities for EM&V implementation.

- ▶ Allow sufficient time (from kick off to completion) to complete EM&V studies that require process and impact evaluations and need to be integrated into program planning, recognizing studies take varying amounts of time.
- ▶ Identify strategies to narrow the timeframe between program participation and verification of results for C&I impact evaluations. This may mean any combination of the following: a) more real-time sampling and evaluation, after verification but prior to year-end reporting; b) multi-method EM&V approach, including engineering reviews, focusing on-sites on the highest priority measures where on-sites are warranted. National Grid is currently implementing studies with rolling samples to address this.
- ▶ Incorporate process-related evaluation activities for all programs at least once a cycle, focusing on areas that could provide the greatest benefit and insight related to program delivery and effectiveness. Continue to build in opportunities for evaluations to provide early insights into new program initiatives, pilots, assessments, demonstrations, and even new

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elements to existing programs, following strategies outlined in the 2021 Energy Efficiency Plan<sup>11</sup>.

- ▶ Continue to integrate the EERMC Consultants in critical points of the review process to identify unforeseen issues, receive and discuss their methodological guidance, and gain buy-in on the approach. Critical points include planning, sample planning, and data collection instrumentation.
- ▶ Consider closer coordination between the EM&V team and implementation team, whether it be with National Grid implementation staff and/or vendors. Doing so could continue to impress the need for EM&V to effectively inform and integrate into implementation processes and fosters a collaborative relationship to help both parties identify how they can work together to improve energy efficiency program design and implementation.

**EM&V Reporting:** The following relates to process-related opportunities at the reporting stage.

- ▶ Ensure all reports provide sufficient data to understand confidence, precision, and any caveats related to the representativeness of the population (this is done most of the time, with some minor areas for improvement in residential reporting).
- ▶ Based on Rhode Island's current structure, recognize and build in sufficient time for at minimum three points of review and feedback including from National Grid staff, the EERMC Consultants, and OER. As a standard practice, integrate results presentations to help make the reporting process more efficient.
- ▶ Related to stakeholder review process, primarily EERMC Consultant efforts, continue to streamline, coordinate, and synthesize feedback for the evaluation team. Further, attempt to prioritize feedback to methodological and finding-related concerns, recognizing that while feedback is valuable, overly extensive can create delays as the evaluation teams strive to address each comment, big and small.

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<sup>11</sup> [rieermc.ri.gov/wp-content/uploads/2020/08/first-draft-2021-annual-energy-efficiency-plan.pdf](http://rieermc.ri.gov/wp-content/uploads/2020/08/first-draft-2021-annual-energy-efficiency-plan.pdf)



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# Appendix A. Data Collection Instruments

1. Stakeholder Interview Guide
2. EM&V Vendor Interview Guide
3. Implementation Vendor Introduction Email and Questions

## TASK 1 – REVIEW OF RHODE ISLAND’S EM&V PROCESS STAKEHOLDER INTERVIEW GUIDE

### RESEARCH OVERVIEW

To better understand the Rhode Island’s current EM&V process from all perspectives, the BrightLine team will conduct up to eight phone interviews with EM&V stakeholders. These interviews will also focus on how EM&V findings and recommendations are applied to Rhode Island programs, both retrospectively and prospectively, as well as any potential pain points in the current EM&V process. Interviews will focus on the prior two years’ evaluations. Interviewers will reference EM&V reports from the prior two years to use as a basis to discuss the EM&V process and the use and application of EM&V results.

Three stakeholder groups will be interviewed using this guide: 1) National Grid staff; 2) OER staff and 3) EERMC Consultants (also referred to as C-team members). The questions asked of each group will vary and deviate from this guide based on the actual discussion. This guide is to be used as a reference for the interviewer in exploring topics. .

### RESEARCH FOCUS

The interviews will explore the following:

- the structure of National Grid’s Rhode Island energy efficiency programs and role of EM&V in the process and programming
- the frequency and level of investment of Rhode Island-specific EM&V studies;
- trade-offs of conducting Rhode Island-specific research versus leveraging studies from other jurisdictions;
- benefits and limitations of applying results from other jurisdictions;
- how results are used in annual reporting and program/portfolio planning;
- the effectiveness of the EM&V process for stakeholders;
- concerns about the EM&V process, related costs, or application of results, including timeliness of receiving preliminary and final results; and
- calculation and use of non-energy impacts

## INTRODUCTION

Thank you for agreeing to speak with us today. We expect the interview to last about [one hour / one and a half hours depending on interview]. This discussion will focus on the EM&V process in Rhode Island, specifically how findings and recommendations from studies are used and where pain points or opportunities for improvement exist in the process.

Do you have any questions before we begin?

For note-taking purposes, it's helpful for me to record the conversation so that I can replay it in case I miss anything. Everything you say will be kept confidential and we will report our findings in aggregate only. We won't attach your name or any other identifying information to any of our results or findings.

Would it be okay for me to record this conversation? [IF YES: Begin recording, if not, do not record]

## ROLES AND RESPONSIBILITIES

1. What is your overarching role at <ORGANIZATION>?
2. What is your role in the Rhode Island EM&V process?
  - a. How long have you been in this role?
  - b. How have things changed, if at all, since you have been in this role?
3. Who do you typically interact with related to EM&V as well as implementation? Consider internal and external individuals or parties.

## REVIEW OF NATIONAL GRID RHODE ISLAND PROGRAMS

(ASK THE FOLLOWING TWO QUESTIONS ONLY ONCE, AND IN NATIONAL GRID STAFF INTERVIEW ONLY)

Briefly discuss / cover each initiative offered in 2017 and 2018 that you are involved with, specifically (but not exclusive to) the following topics:

1. Vendors engaged in the initiative (e.g., implementors, other vendors)
2. Whether those vendors provide services for similar programs in Massachusetts
3. Any major program changes from recent prior years (2015 or 2016)

## EM&V PROCESS

1. Could you talk me through, at a high-level, the current EM&V process for Rhode Island from your perspective? Specifically:
  - a. How does National Grid contract for EM&V services? (*National Grid only*)
  - b. How does National Grid determine *when* to contract for EM&V for specific Initiatives and sub-Initiatives? What are those decision-points? How does this vary by initiative? (*National Grid only*)
  - c. Are there deadlines imposed on studies? If so, what drives those deadlines, and what are the consequences for not meeting deadlines?

2. When are you brought into the EM&V process? How are you brought into the EM&V process (by whom and for what purpose)?
  - a. What feedback are you asked to provide and generally in what timeline?
  - b. Do you have any feedback related to how you integrate into the EM&V process?
3. How and when do you consider which EM&V studies should be conducted? What types of studies are prioritized? (Probe by traditional EM&V, market characterization, NEBS, etc.)
4. (If not mentioned) How does the EM&V planning and studies align with the three-year plan as well as annual plans? frequency, number, and timing of EM&V studies)?
  - a. How has this changed over the years, if at all?
  - b. Does this vary by sector/EM&V contractor/type of study?
  - c. What is the rationale for this cadence?
  - d. Do you have any feedback on cadence of EM&V studies? Are they enough? Any areas for improvement? Please describe.
5. What is the process for prioritizing EM&V activities?
  - a. Who do you engage or consult with when considering EM&V priorities?
  - b. What considerations do you have as you are prioritizing EM&V activities?
  - c. To-date, which types of technologies or programs have been prioritized for EM&V and why?
  - d. Do you see that changing in the next few years, and if so how?
  - e. What are *your* priorities, and how do they differ from what has been implemented or initiated, if at all?
6. We have the list of EM&V reports completed. Does National Grid complete any EM&V activities outside of those represented in publicly available reports, such as ad-hoc studies that may not be published? Describe.
7. *(IF NOT ADDRESSED ABOVE)* How do you / [ORGANIZATION] determine when to focus on:
  - a. Baseline studies
  - b. Other general market studies / market assessments
  - c. Impact evaluations (verification of savings)
  - d. Process evaluations
  - e. Other specialty studies (e.g., code, hours of use, etc.)

## RHODE ISLAND-SPECIFIC STUDIES

1. How is it decided whether a study will be Rhode Island-specific or done in collaboration with other jurisdictions (e.g., Massachusetts)?
2. How are study results from other jurisdictions applied to Rhode Island-specific programs? Are the implementation vendors evaluated in these other jurisdictions the same, or different, from Rhode Island's vendors? [Probe on who if different.]

3. What are the trade-offs to completing studies specifically related to Rhode Island versus using collaborative studies (pooling results) and/or results from other states? Where have the benefits outweighed the drawbacks of using studies from other states, and visa-versa?
4. Are there any unique challenges facing Rhode Island in regard to EM&V or energy efficiency in general?
5. Are there EM&V or EM&V-specific reporting processes from outside of Rhode Island that could benefit Rhode Island EM&V? [PROBE: Other states that are similar. do they have experience in other state's EM&V? Is Rhode Island following similar standards? If not why?] *(This question should be asked of all but high priority for interviewees that work across states, including Ralph, Mark, and Dave)*

## REPORTING AND APPLICATION OF RESULTS

1. Please confirm the specific EM&V requirements and what you are required to measure and report (from a regulatory standpoint). (Probe on):
  - a. Confidence and precision required, and at what level (e.g., portfolio annually, program, measure, etc.)
  - b. Impact evaluation requirements
  - c. Net savings (and what is included as part of net savings)
  - d. Process evaluation requirements
  - e. Market evaluation requirements
  - f. Baseline requirements
  - g. Cost-effectiveness (is it part of EM&V, planning, or both)?
  - h. Anything else?
2. Please walk me through the reporting and approval process for individual studies.
  - a. What parties are involved in the EM&V report review process?
  - b. When are those parties engaged?
  - c. How are conflicts reconciled?
3. We recognize each study varies, but what is the range in length (in number of months) for completing EM&V studies from initiation to final approval?
  - a. How does this timeline vary by study type?
  - b. Is the time from start to finish generally ideal and/or reasonable? (If not) Why not?
  - c. Does this timeline meet your needs? Why or why not?
4. Related to non-energy impacts:
  - a. How often are non-energy impacts assessed and reported?
  - b. Which non-energy impacts are measured and reported? Of these, which are required?
  - c. How are these non-energy impacts determined? Such as, based on primary Rhode Island data, using secondary data sources, etc.?
  - d. How are non-energy impacts incorporated in cost-effectiveness testing and reporting?
  - e. Are there any non-energy impacts that you think should be included in cost-effectiveness testing and reporting? If so, which impacts should be included?

- f. Do you have any concerns with the process of calculating and/or integrating non-energy impacts? Explain.
5. How are results from studies used in annual reporting and program/portfolio planning?
- a. Are results used in any specific ways? If so, how?

## EM&V PROCESS FLOWCHART

*NOTE: The following questions are based on the EM&V process flowchart. These questions will be asked as they are relevant to the stakeholder's role in the EM&V process. Some of the following questions may be addressed from the general discussion above. Where this is the case, just confirm understanding.*

1. What are the primary input sources for identifying and scoping EM&V studies? [PROBE: EM&V team, program managers, regulators, OER, past studies, current market conditions, anticipated changes]
2. How are EM&V budgets set? [PROBE at both the study level and overall annual budget]
  - a. From your perspective, are EM&V study budgets sufficient to meet the needs of the study?
  - b. From your perspective, is the overall budget allocated to EM&V sufficient to meet Rhode Island's research and evaluation needs? Please explain. [PROBE: is anything overlooked?]
  - c. What would be valuable to if additional funding were available?
3. How is it determined which studies need to be updated or need follow-up research?
  - a. Are any specific criteria used in this determination? If so, what criteria?
4. How is the master list compiled for the Annual Plan?
  - a. Who is responsible for compiling study ideas?
  - b. How are studies prioritized?
  - c. How many studies are typically included in the master list?
  - d. How many are typically cut from the master list? Why don't they make the list?
5. What is the process for approving the EM&V activities documented in the Annual Plan?
  - a. How long does the approval process typically last?
  - b. Are there any pain points or opportunities for improvement to this process?
6. How is it determined whether a study needs an RFP?
  - a. What does "evaluation team manages customer relationship during RFP process" mean? Who is the customer in this scenario?
  - b. What factors does the evaluation team consider when selecting/reviewing a bid?
7. If an RFP is not used:
  - a. How does National Grid select an EM&V contractor?
  - b. What other parties outside of National Grid, if any, need to approve the selection?
8. What is the process for fulfilling an EM&V study related data request?
  - a. How long does this process typically take?

- b. Are there any pain points in receiving the data request from the consultant? [PROBE: consultants completing the request inaccurately; identifying available data; identifying what data is needed]
  - c. What questions or pain points typically emerge at this stage? How are they resolved?
- 9. Once the study has begun, what is your role in the study?
  - a. Are there any pain points or opportunities for improvement at this stage of the process?
- 10. What is your role in reviewing study drafts?
  - a. Are there any pain points or opportunities for improvement at this stage of the process?
- 11. About what percentage of your time does do you spend working with Rhode Island's EM&V studies?
  - a. At one time, about how many studies could you be working with, both in Rhode Island and elsewhere?
  - b. Do you feel you have sufficient time to do what you need to do?
- 12. Who is the final draft circulated to internally?
  - a. What types of feedback or questions emerge from an internal review of the final draft?
- 13. How do your implementation vendors integrate within the EM&V process? (Specifically probe on):
  - a. Study design
  - b. Interviews
  - c. Data requests
  - d. Reporting
- 14. What information, if any, is shared with vendors once EM&V is complete, and how?
- 15. Are vendors held accountable for EM&V results? If so, how?
- 16. [IF VENDORS RECEIVE EM&V RESULTS] How does National Grid require vendors to respond and/or revise programming in response to EM&V recommendations and findings, if at all?

## CLOSING

- 1. How effective do you think the current Rhode Island EM&V process is?
  - a. Are there any processes that work particularly well?
  - b. Are there any other processes that present pain points or opportunities for improvement that we haven't discussed today?  
[PROBE: pain points related to cost; application of study results; timeliness of receiving the preliminary and final results; meeting study deadlines]
  - c. What recommendations do you have to improve the Rhode Island EM&V process?
- 2. Do you have any other thoughts that you would like to share with us?

Thank you so much for talking the time to speak with us today. As we continue this research, would it be ok for us to email you about any follow-up questions?

## TASK 1 – REVIEW OF RHODE ISLAND’S EM&V PROCESS EM&V VENDOR INTERVIEW GUIDE

### RESEARCH OVERVIEW

To better understand the Rhode Island’s current EM&V process from all perspectives, the BrightLine team will conduct up to 3 interviews with EM&V Evaluators. These interviews will also focus on how EM&V findings and recommendations are applied to Rhode Island programs, both retrospectively and prospectively, as well as any potential pain points in the current EM&V process. Interviews will focus on the prior two years’ evaluations. Interviewers will reference EM&V reports from the prior two years to use as a basis to discuss the EM&V process and the use and application of EM&V results.

This guide is not intended to be read verbatim but rather used as a guide for the interviewer in exploring topics and may change based on the actual discussion.

### RESEARCH FOCUS

The interviews will explore the following:

- Process, end-to-end, on working with National Grid Rhode Island on EM&V
- How do they conduct evaluations;
- How was/is communication with stakeholders and with Implementors;
- How efficient and timely was the data transfer process, and were there any other analysis issues;
- How the evaluation process in Rhode Island could be improved;
- Their experiences with evaluation outside of Rhode Island, and how these experiences compare to evaluation in Rhode Island;

### INTRODUCTION

Thank you for agreeing to speak with us today. We expect the interview to last about an hour. This discussion will focus on the EM&V process in Rhode Island, specifically how findings and recommendations from studies are used and where pain points or opportunities for improvement exist in the process.

Do you have any questions before we begin?

For note-taking purposes, it’s helpful for me to record the conversation so that I can replay it in case I miss anything. Everything you say will be kept confidential and we will report our findings in aggregate only. We won’t attach your name or any other identifying information to any of our results or findings.

Would it be okay for me to record this conversation? [IF YES: Begin recording]

### ROLES AND RESPONSIBILITIES

1. What is your overarching role at <ORGANIZATION>?
  - a. How long have you been in this role?

2. What was your role in the <INITIATIVE NAME> that <ORGANIZATION> evaluated in Rhode Island in <YEAR>?
  - a. Have you overseen EM&V outside of Rhode Island?
  - b. Overall, how has your experience been with the Rhode Island EM&V process?

## EM&V PROCESS

1. I'd like to talk to you about EM&V projects in Rhode Island. [IF MULTIPLE STUDIES, READ: I'm going to ground us in a specific initiative-level evaluation, but let me know if your experience differed for other studies] Could you walk me through, at a high level about the evaluation of <INITIATIVE>. What was the focus?
2. What organizations, or stakeholders, do you typically interact with throughout the EM&V process? (Probe for National Grid, OER, EERMC, implementers, other evaluators). ASK BELOW FOR EACH INDIVIDUAL/GROUP MENTIONED:
  - a. How do they/this person/engage in the EM&V process?
  - b. At what point in the process do you interact with these groups?
  - c. Did they/does this person have reasonable expectations?

I have a few questions about the processes you went through as part of this study.

3. Please tell me about how you were selected as the EM&V vendor (RFP? Sole Sourced?)
4. Had you completed a similar, or the same, study for National Grid Rhode Island in the past? If so, is it a recurring study? Describe.
5. Please describe the planning process.
  - a. Did you have the information you needed to sufficiently plan?
  - b. Did you interview individuals prior to planning? If so, who did you interview?
  - c. Which individuals or organizations were engaged in the planning process? [IF ADDRESSED IN Q2 ABOVE, SIMPLY CONFIRM]
  - d. Was their feedback reasonable?
  - e. About how long did it take from kick-off to approval of the plan?
  - f. Do you have any feedback on the planning process?
6. Please describe, at a high level, what you did as part of conducting the EM&V.
  - a. How was the data transfer process? [PROBE: Were there data transfer issues? Data quality issues?]
  - b. Who, or what organizations, engaged with you throughout the evaluation process? [IF ADDRESSED IN Q2 ABOVE, SIMPLY CONFIRM.] How did they/he/she engage?
  - c. Was there anything that hindered you from completing evaluation activities planned? Please explain, including whether the issue was rectified.
  - d. Do you have any feedback on the evaluation process?
7. Finally, on this topic of EM&V processes, I'd like to understand reporting.
  - a. How long did you have from project initiation to draft, then final, report delivery? [PROBE: how does this compare to other experiences? Was the length of time allotted difficult to meet?]

- b. How were expectations on reporting identified and discussed? And with whom?
  - c. Who, and/or what organizations, engaged with you throughout the reporting process, including the review process? [IF ADDRESSED IN Q2 ABOVE, SIMPLY CONFIRM.] How so?
  - d. How extensive were the comments and feedback received? I know this is a subjective, open-ended question, but your characterization would be helpful given your experience.
  - e. Were the comments and feedback received reasonable?
  - f. About how long did it take from plan approval to final deliverable?
  - g. Any other feedback on the reporting process?
8. Are non-energy impacts, within scope for the projects you have done in Rhode Island?
- a. If so, How are non-energy impacts calculated?
    - i. What types of non-energy impacts were/are considered?
9. From **your perspective**, are EM&V study budgets sufficient to meet the needs of the study?
- a. If not, why not? And if yes, why?
  - b. How does Rhode Island's EM&V budget for studies such as this compare to other jurisdictions where you work? Please explain.
  - c. Are there areas of research and evaluation that you think should be completed if additional funding were available?
10. How, if at all, have you seen the typical process for evaluation in Rhode Island differ from other states where you work?
- a. Are there any good practices from other states that you feel Rhode Island would benefit from implementing?
11. In your opinion how effective is the current Rhode Island EM&V process?
- a. Are there any processes that work particularly well?
  - b. Are there any processes that present pain points or opportunities for improvement?  
[PROBE: pain points related to evaluation activities, feedback, or communication]
12. What other recommendations, if any, do you have to improve the Rhode Island EM&V process?

## EM&V INTERACTIONS

1. We've discussed this quite a bit above, but do you have any feedback on the interactions regarding EM&V with National Grid in Rhode Island? Other stakeholders?
2. [IF IMPLEMENTERS WERE NOT MENTIONED ABOVE] You did not mention having interactions with implementers. Would having those interactions have been useful? Explain.

## CLOSING

1. Do you have any other thoughts about the Rhode Island EM&V process that you would like to share with us?

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2. Thank you so much for taking the time to speak with us today. As we continue this research, would it be ok for us to email you about any follow-up questions?

## TASK 1 – REVIEW OF RHODE ISLAND’S EM&V PROCESS IMPLEMENTOR EMAIL AND PRIORITY QUESTIONS

Good morning,

I am working with the Rhode Island Office of Energy Resources (OER) to understand how different organizations interact with National Grid Rhode Island’s energy efficiency programs. Specifically, we are interested in how, if at all, your organization interacts with their evaluation activities, where they hire contractors to verify reported energy savings and assess program processes. As a key player within the state’s energy efficiency offerings, it is important we include any experiences and perspectives you have related to the process. Please be assured we will keep your feedback confidential; information you provide will remain anonymous, not directly associated with you or your organization.

We realize you and your team are exceptionally busy at this moment. Rather than request an interview, I am asking that you take a few moments to answer just a few high-priority questions for us. If easier, I would be very happy to set up a call to discuss. We anticipate it will take 10-15 minutes to address our questions. Alternately, feel free to just reach out directly to me at 608-445-8006.

We are hoping to receive responses to these questions no later than Friday, August 21. Please let me know if that is possible.

Again, I recognize how very busy you are and really appreciate your time to answer these questions. Your feedback will be highly insightful for our study.

### QUESTIONS

1. What is your organization responsible for as part of your contract with National Grid Rhode Island’s [INSERT PROGRAM NAME(S)]?
2. How, if at all, does your organization contribute to program planning?
3. Does your organization have contracted performance metrics with National Grid tied to evaluation results?? If so, please describe.

4. Please use the below table to describe how, if at all, your organization participates in and experiences the evaluation process. For each activity please note whether someone from your organization participates in that activity and, if so, describe to the extent possible the interaction with evaluation as well as perception of experiences (positive and challenges).

Activity	Yes/No	(If yes) Describe your experience. Include positive experiences and challenges.
Provides input to what research needs you have that could be included in National Grid's evaluation activities		
Participate in interviews with evaluators		
Review data collection materials (e.g., data collection instruments, letters)		
Respond to data requests for evaluation		
Review draft or final evaluation reports		
Meet with evaluation vendors about evaluation results		
Meet with National Grid Rhode Island and/or other stakeholders about evaluation results		
Update energy savings assumptions and/or program delivery in response to evaluation results		
Support evaluators in connecting with participating customers		
Something else (please describe):		

5. **[ONLY ANSWER IF YOU SAID YES TO ANY OF THE ABOVE]** Do you feel National Grid's evaluation efforts are valuable, and why or why not?
6. What about National Grid's evaluation process would you like to change, if anything?
7. Do you have other feedback for me related to the evaluation process in Rhode Island?

Thank you for your time!