# Memo

**STATE OF RHODE ISLAND**
**ENERGY EFFICIENCY &**
**RESOURCE MANAGEMENT COUNCIL**

**To:** EERMC
**From:** Sam Ross / C-Team
**CC:** Becca Trietch / OER

CONSULTANT TEAM

**Date:** June 5, 2020
**Subject:** Rhode Island Market Potential Study & BCR Model Mapping

## I.    INTRODUCTION

This memo summarizes the mapping tool and initial findings from the Energy Efficiency and Resource Management Council (EERMC) Consultant Team's work to integrate results from the Rhode Island Market Potential Study (MPS) into National Grid's 2021-2023 Three-Year Plan development process.

The memo begins, in Section II, by providing context around the appropriate use of MPS results in the program planning process. Section III follows with a review of the mapping tool that has been developed and a brief summary of initial findings, followed by Section IV, which reviews next steps in the process for leveraging MPS results in supporting the development of National Grid's Three-Year Plan. Initial findings are presented in graphical form in Section V.

## II.    USING POTENTIAL STUDY RESULTS IN PROGRAM PLANNING

Market Potential Studies' primary purpose is to quantify the *potential* for energy efficiency and other resources to be deployed over a fixed time horizon and geography. The analysis underlying these studies begins with engineering knowledge about available technologies and building stock (technical potential), subsequently applies market data related to costs, savings, and other non-energy impacts among other considerations (economic potential), and only then applies estimated impacts related to local market conditions, customer economics, and a few possible sets of typically very high-level program design considerations, generally heavily drawn from recent programs (max/mid/low program potential).

Because of the high-level, often qualitative, and tertiary position of the limited program design information that is utilized in market potential studies, **it is critical to highlight that Market Potential Studies are not program design studies**. While they are very useful for identifying pools of available savings (e.g. there is a sizeable opportunity to displace inefficient electric resistance heating), it is generally not the case that Market Potential Studies have been optimized to model a specific mix of measures that balances multiple policy priorities. It is also generally not the case that the mix of program design features (incentives, marketing, training and capacity building, other enabling strategies) have been critically examined for cost efficiency and optimized. Consequently, it is inappropriate to view a potential study as a prescriptive result or recommendation with respect to specific measures that must be offered, or specific delivery pathways that must be utilized. These questions are appropriately handled during program planning, which should rely on high-level, rather than highly-granular, results from market potential studies.

In addition, Market Potential Studies are inherently snapshots in time. They are derived from the best data available at the time they are conducted, and it is imperative that program planning activities account for and appropriately adapt to information that has been obtained in the time between the study's execution and the utilization of its results.

## III.    OVERVIEW OF MAPPING TOOL

The Market Potential Study & BCR Model Mapping Tool was conceived as a solution to the imperfect alignment between the granularity of National Grid's BCR Models and the measure list from the RI MPS. Since the Three-Year Plan development process consists of a number of parallel work streams with at times tight deadlines, it is critical that data from the MPS is readily available, and also being used correctly in multiple simultaneous settings.

The Consultant Team took the step of assembling a set of shared *measure categories*, roughly at the end-use level, and created a draft mapping that aligned both the BCR Model and the MPS results to these measure categories. This list was shared with National Grid's team and other stakeholders for feedback, while the Consultant Team used the draft mapping to develop comparisons between the 2020 BCR Model and the MPS maximum achievable results, the same data used to set National Grid's Three Year Savings Targets by the EERMC and approved by the Rhode Island Public Utility Commission.

These comparisons highlighted several measure categories where there is a particularly large gap between the planned 2020 savings reflected in the 2020 BCR Model, and the savings levels reflected by the MPS. For the purposes of this memo, we have highlighted several measure categories in each of electric and natural gas efficiency where this gap is particularly pronounced, while working closely with National Grid, the Rhode Island Office of Energy Resources, the Division of Public Utilities and Carriers, and other stakeholders to tackle the next steps discussed in Section IV.

**Table 1. Measure Categories with Largest Gaps between BCR Model and MPS 2021 Max Achievable Savings, Lifetime MWh**

| Electric Measure Categories | Natural Gas Measure Categories |
|---|---|
| C&I Compressed Air | Residential Hot Water |
| Residential Hot Water | Residential HVAC |
| Residential HVAC | Residential Whole Building |
| Residential Envelope | C&I Food Service |
| C&I Food Service | C&I HVAC |

*Note on Table 1: Graphs showing these measure categories and associated gaps are included in Section V. Within the MPS results, the electric categories cover 23% of max achievable potential, while for gas, the figure is 78%.*

## Caveats

The results presented in this memo are subject to a few important caveats, summarized below.

- The 2020 BC model data was not modified to account for progress to date, or ensure alignment of measures offered (e.g. residential LED A lamp savings).
- Various '*custom*' measure categories in the BCR model were partially broken out based on recent evaluation data, but could not be fully parsed into other measure categories.
- The results in this memo reflect the Consultant Team's draft mappings, though our view is that forthcoming modifications will not significantly affect these results.
- The BCR Models are structurally oriented around program delivery pathways, while the Market Potential Study is structurally oriented around energy end uses and measures. This led to some judgements in the mapping that may be revisited, per the prior note.
- The BCR Models have generally less granularity with respect to the individual measures being offered, which also resulted in some judgements during the mapping process, and restricted the level of granularity available in the mapping process, especially for commercial & industrial measures.

## IV.    NEXT STEPS

The Consultant Team envisions the following key steps as the comparisons enabled by this mapping tool are finalized and then integrated into the Three-Year Plan development process. These steps do not need to be undertaken strictly sequentially, though they are presented in an order that we think is most logical.

- A) **Finalize measure-level mapping**, as discussed in the caveat section above.
- B) **Incorporate Three-Year Plan BCR Models** into mapping tool. This will enable a systematic review of gaps between the draft Three-Year Plan and the MPS results, and provide concrete, quantitative reference points that can be used to inform the explanation of these gaps, as well as the exploration of potential opportunities to reduce or eliminate them.
- C) **Continue expanding tool functionality.** This includes a range of improvements, but at minimum will include incorporating Mid and Low program achievable results from the MPS, as well as developing more granular comparisons between the MPS results and Three-Year Plan BCR Models as needed to inform planning processes. Importantly, any comparisons at levels below *measure category* will be subject to the 'potential study vs. program design study' caveat described in Section III. In addition, more granular comparisons will need to be assessed individually, due both to the limited granularity of C&I BCR Model data, as well as to the structural differences between the datasets which render more granular mappings less likely to be perfect 'apples to apples' comparisons.

## V.     GRAPHICAL FINDINGS

*Note: In all figures, the BC Model values for 2021-2023 and percent difference field are not yet populated because there is not yet any data available for National Grid's first draft 2021-2023 Three-Year Plan.*

### Top 5 Electric End Uses

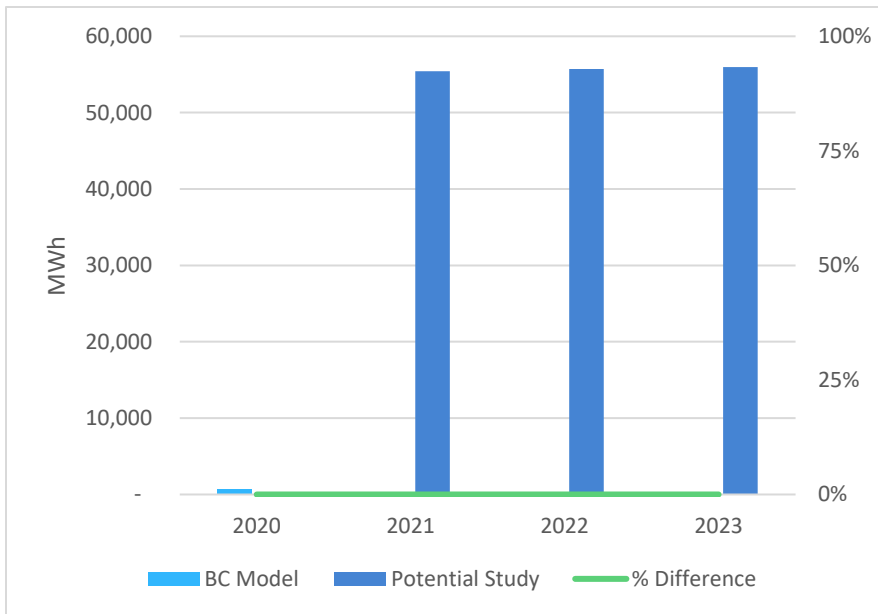Figure 1. C&I Food Service Electric Savings Comparison, 2021-2023 (MWh)



Figure 2. Residential Envelope Electric Savings Comparison, 2021-2023 (MWh)
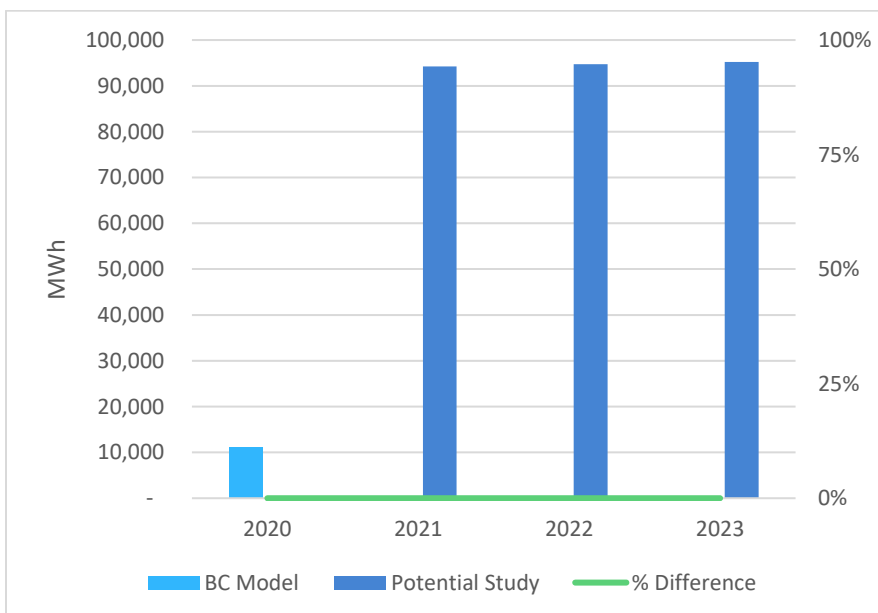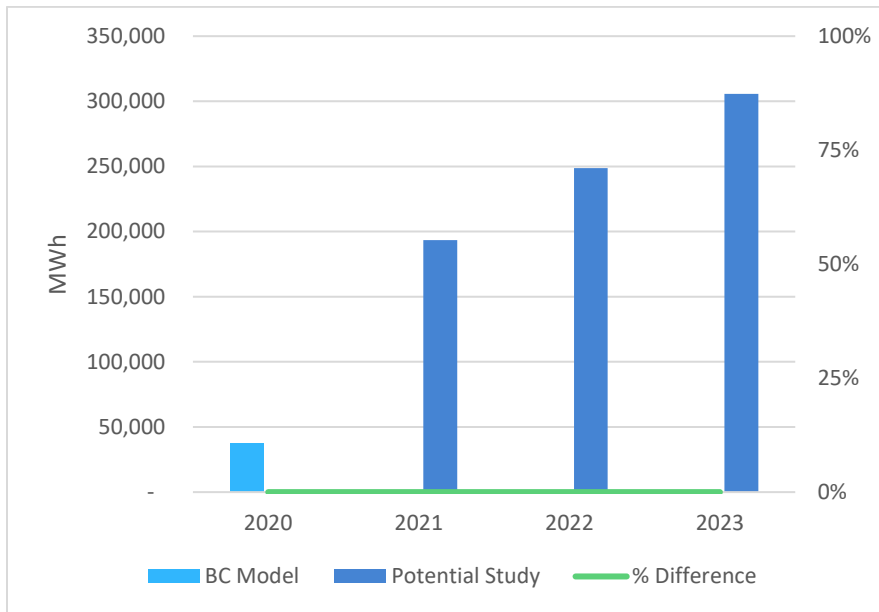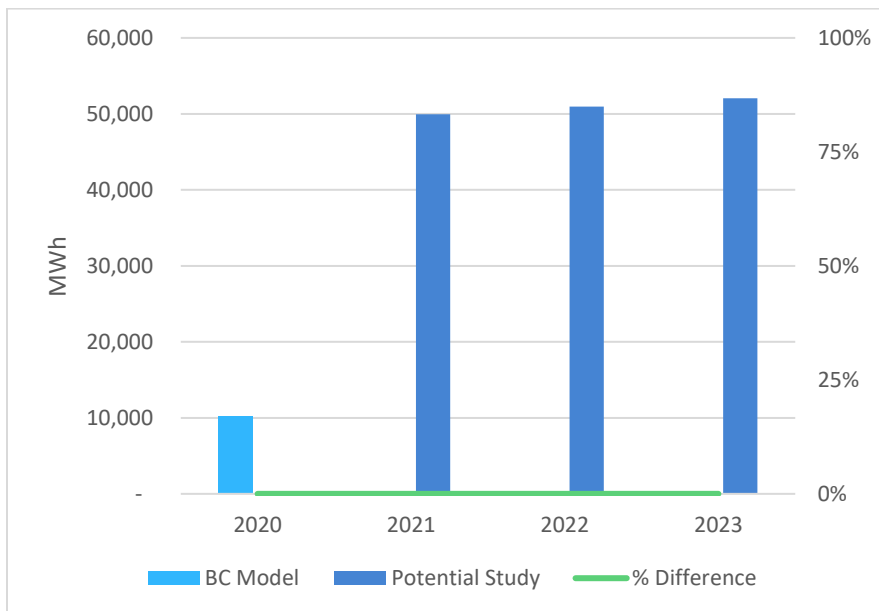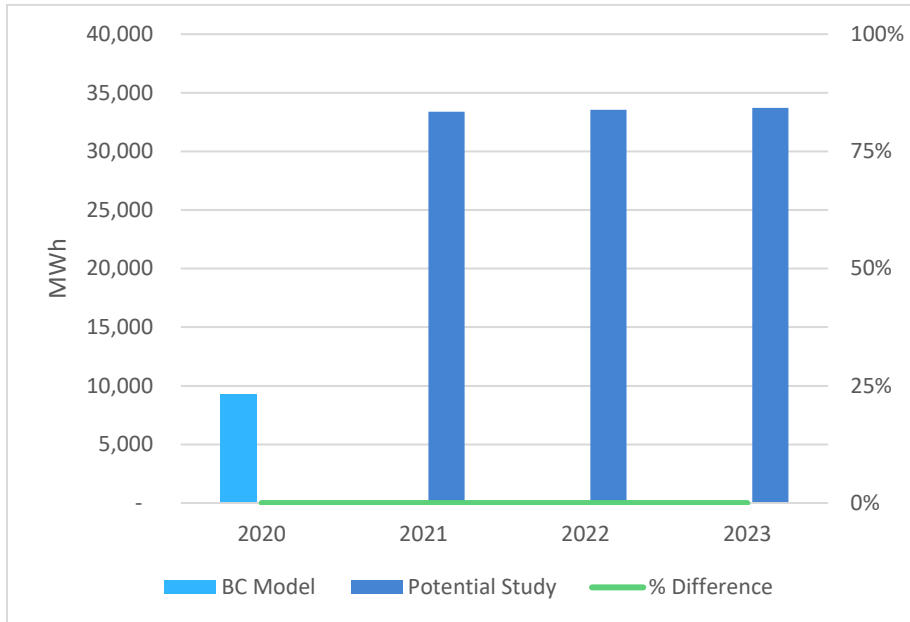
Figure 3. Residential HVAC Electric Savings Comparison, 2021-2023 (MWh)



Figure 4. Residential Hot Water Electric Savings Comparison, 2021-2023 (MWh)

Figure 5. C&I Compressed Air Electric Savings Comparison, 2021-2023 (MWh)



## Top 5 Gas End Uses

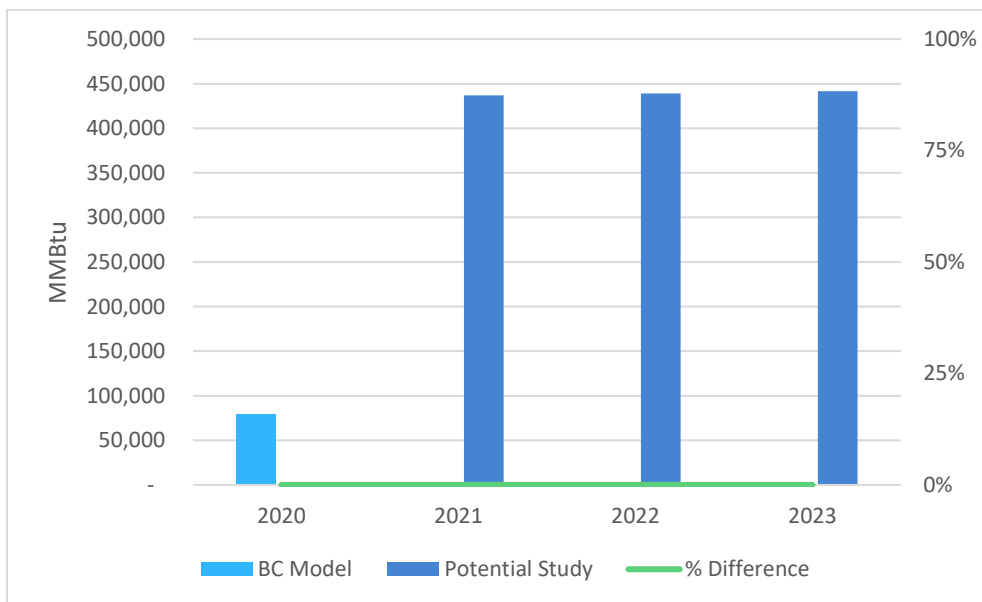Figure 6. Residential Hot Water Natural Gas Savings Comparison, 2021-2023 (MMBtu)

Figure 7. Residential HVAC Natural Gas Savings Comparison, 2021-2023 (MMBtu)
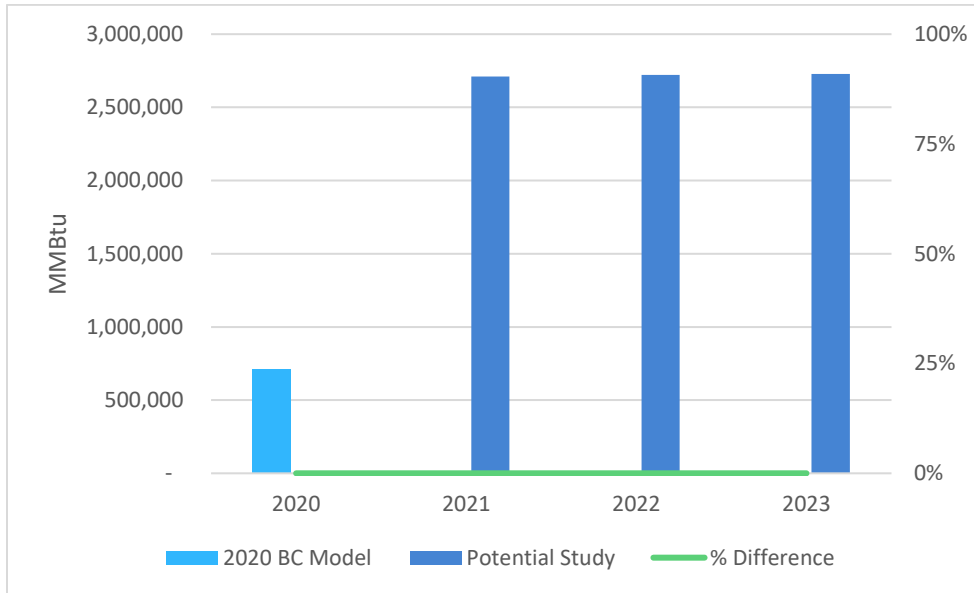


Figure 8. Residential Whole Building Natural Gas Savings Comparison, 2021-2023 (MMBtu)
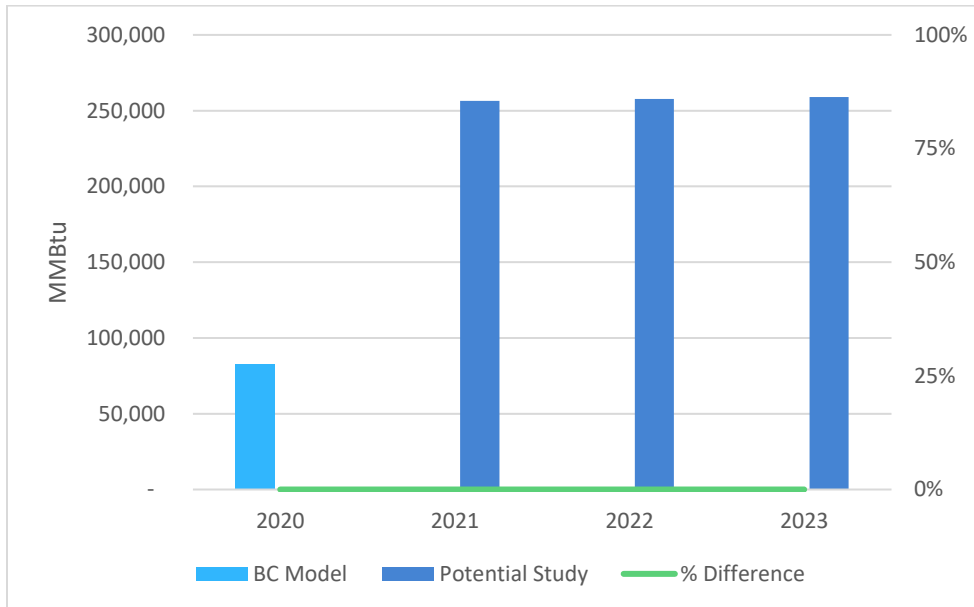
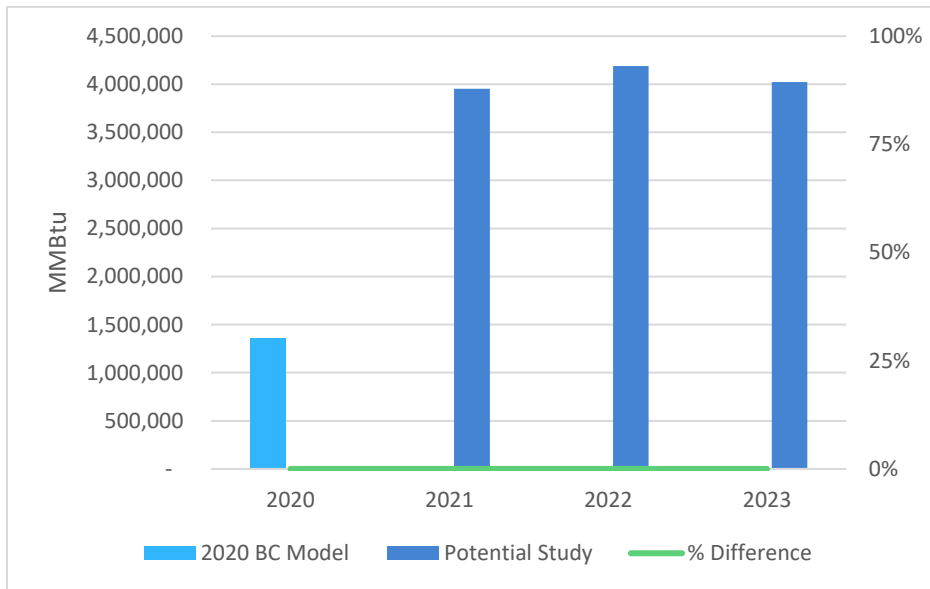Figure 9. C&I HVAC Natural Gas Savings Comparison, 2021-2023 (MMBtu)



Figure 10. C&I Food Service Natural Gas Savings Comparison, 2021-2023 (MMBtu)