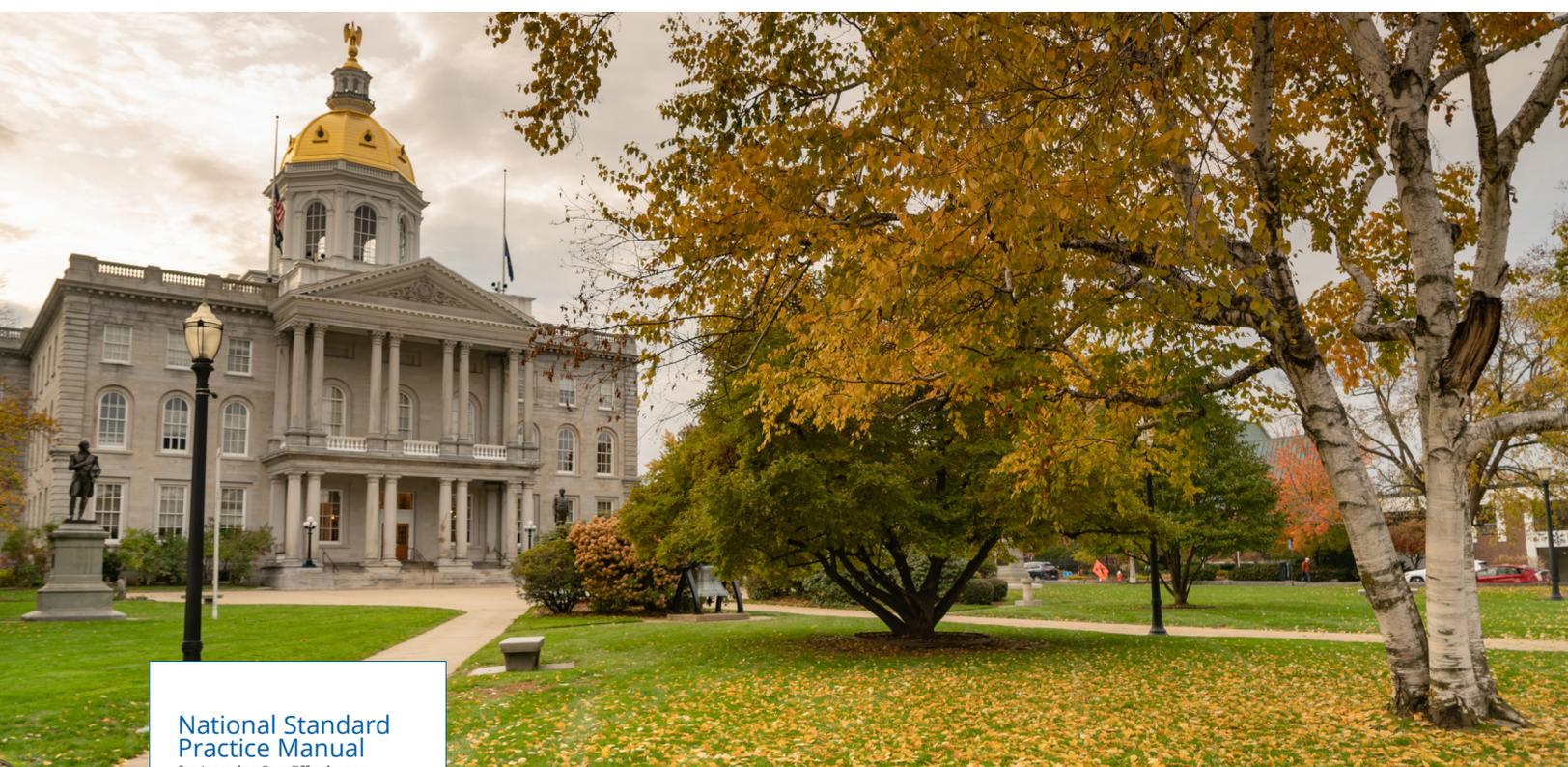


# National Standard Practice Manual

## CASE STUDY: New Hampshire



### National Standard Practice Manual

for Assessing Cost-Effectiveness of Energy Efficiency Resources

EDITION 1 Spring 2017



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# National Standard Practice Manual

## Case Study: New Hampshire

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Prepared by  
The National Efficiency Screening Project



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## **Acronyms**

Benefit/Cost Working Group (B/C WG)

Cost-Effectiveness Test (CE Test)

Distributed Energy Resources (DERs)

Energy Efficiency (EE)

EE Resource Standard (EERS)

Evaluation, Measurement, and Verification (EM&V)

Granite State Test (GST)

National Standard Practice Manual (NSPM)

New Hampshire Public Utilities Commission (NH PUC)

Total Resource Cost Test (TRC)

Utility Cost Test (UCT)

## 1. Introduction

This case study illustrates how the National Standard Practice Manual (NSPM) has been applied by one state, New Hampshire, as a framework to assess state energy efficiency cost-effectiveness (CE) testing practices. The NH Public Utilities Commission (PUC) determined that the Benefit/Cost Working Group (B/C WG) would review issues related to the CE test using the NSPM during Spring and Summer 2019.

The EM&V WG hired Synapse Energy Economics, who provided technical assistance at monthly B/C WG meetings coordinated by PUC staff on the NSPM's application. Synapse developed [a report including recommendations](#) for an updated energy efficiency (EE) CE screening framework that more accurately reflects NH policies and priorities, which the B/C WG presented to the PUC in fall 2019. On 30 December 2019, the PUC approved the B/C WG recommendations in Order No. 26,322, effective 1 January 2021.

The NSPM centers on a set of guiding economic principles for cost-effectiveness analysis of EE and other distributed energy resources (DERs) (see Table 1). Using these principles as a foundation and moving through the NSPM's 7-step "Resource Value Framework," jurisdictions can assess their existing CE tests for economic soundness and policy alignment, potentially leading to the development of new state-specific tests. The manual is applicable to all electric and gas utilities where DERs are funded by and implemented on behalf of utility customers.

Table 1. NSPM Guiding Principles

<b>Efficiency as a Resource</b>	EE should be compared with other energy resources (both supply-side and demand-side) in a consistent and comprehensive manner.
<b>Policy Goals</b>	A jurisdiction's primary cost-effectiveness test should account for its energy and other applicable policy goals and objectives.
<b>All Relevant Impacts</b>	Cost-effectiveness practices should account for all relevant, substantive impacts (as identified by policy goals,) even those that are difficult to quantify and monetize.
<b>Symmetry</b>	Cost-effectiveness practices should be symmetrical, where both costs and benefits are included for each relevant type of impact.
<b>Forward-Looking Analysis</b>	Cost-effectiveness practices should apply a forward-looking, long-term approach that captures incremental impacts of energy efficiency.
<b>Transparency</b>	Cost-effectiveness practices should be completely transparent, and should fully document all relevant inputs, assumptions, methodologies, and results.

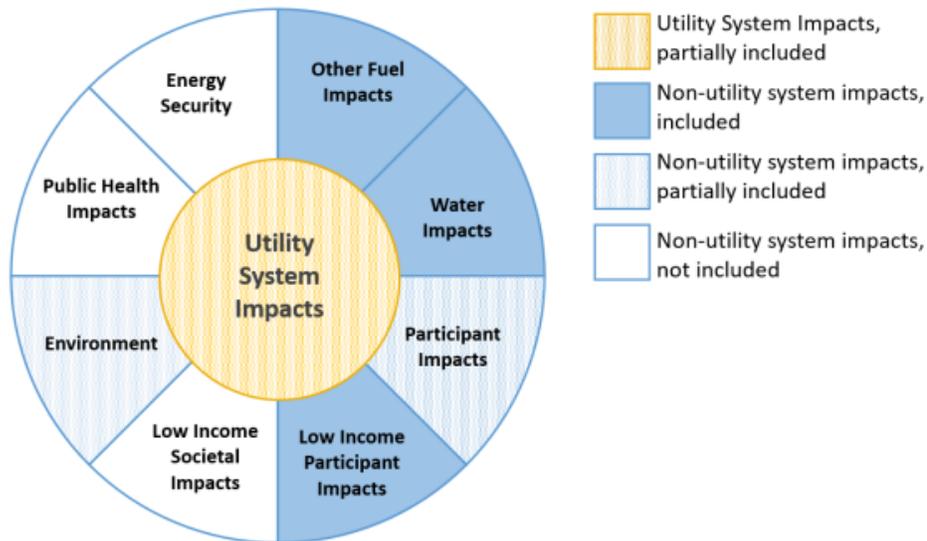
## 2. Background: Cost-Effectiveness Testing in New Hampshire

According to Synapse's report, EE programs have been implemented in NH since the 1980s and the state's EE resource standard (EERS) was implemented in 2016. To meet the EERS, the state utilities jointly prepared the state's first three-year EE Plan, which the PUC approved in 2017 for implementation in 2018-2020. Utilities file annual updates to the three-year plans, and for 2019, stakeholders entered into a settlement agreement to resolve any issues. This settlement required the EM&V WG hire a consultant to review the CE test applied to EE resources in accordance with the NSPM.

New Hampshire utilities currently evaluate EE CE using a Total Resource Cost (TRC) test accounting for program costs and benefits to the utility and participating customers, although the NH TRC is modified such that it does not include all utility system impacts (See Fig. 1). Participant impacts have been included in the NH TRC test through a 10% adder since 2018<sup>Error! Bookmark not defined.</sup>, and low-income

programs have included an additional 10% adder since 2019. Measure benefits are calculated using a measure life up to 25 years, and a low-risk real discount rate of 2.4%.

**Figure 1. Current NH TRC test impacts**



*Source: 2019 B/C Working Group discussions.*

*Notes: The utilities partially account for participant non-energy benefits through a percentage adder in the current New Hampshire TRC Test. The utilities partially account for environmental externalities through a New Hampshire-specific fossil fuel proxy.*

### 3. The NSPM Process in New Hampshire

The NSPM Resource Value Framework consists of seven steps, which guided the B/C WG review process.

1. **Identify Applicable Policy Goals:** The B/C WG reviewed a comprehensive list of current energy laws and statutes, Commission orders, and other energy and EE-related policies. These policies highlighted key state EE policy goals, which guided the group’s identification of relevant costs and benefits in later steps (see Table 2).

Table 2. Policy goals reviewed from B/C WG members

Policy Goal	Definition
Least-cost	Implement resources with the lowest costs; or, prioritize energy efficiency because it is a least-cost resource
Affordability	Reductions in the magnitude and volatility of customers' rates and bills
Fuel diversity	Multiple fuels and resources to meet the supply and demand of the electric grid
Risk	Utility system risk reduction resulting from efficiency resources
Reliability	Reduced probability and/or duration of customer service interruptions
Income eligible	Programs and mechanisms that assist customers with low incomes to manage and afford energy
Customer choice	Markets and products that provide customers with multiple options for electricity goods and services
Environment	The range of environmental costs and benefits that result from efficiency resources
Economic development	Economic development and jobs that are associated with investment in energy efficiency, including job creation and increases in disposable income resulting from energy bill savings for customers
Public health	The range of public health impacts resulting from efficiency resources
Competitive markets	Markets with multiple, competing providers of goods and services, with few barriers for new entry into the market

Source: 2019 B/C Working Group discussions. See also NESP, DSESP.

2. **Include All Utility System Impacts:** Treating EE as a resource (the first NSPM principle) means that any EE CE test should include all utility system impacts, to show the extent to which utility system costs will be affected by efficiency resources. Although some utility system impacts are difficult to quantify, they exist and are still relevant considerations to the CE of EE programs. Synapse recommended adding to a new NH CE test those utility system impacts currently not included in the NH TRC test.
3. **Determine Applicable Non-Utility System Impacts:** Based on the policies gathered in step 1, B/C WG members reviewed non-utility system costs and benefits relevant to state policy goals.

The B/C WG reviewed participant impacts within the context of two NSPM policies. First, that impact inclusion in tests should be consistent with state policy goals. Second, that participant impacts should be treated symmetrically, so that if participant costs are considered, so should be participant benefits. Certain costs and benefits such as participant impacts were not explicitly supported by state policy directives. Therefore, following discussion, the B/C WG determined that participant impacts should be excluded from the primary test (See Synapse report for more details on this discussion and development of a secondary test, pg. 57). The final set of impacts recommended for inclusion in NH's CE tests are summarized in Table 3.

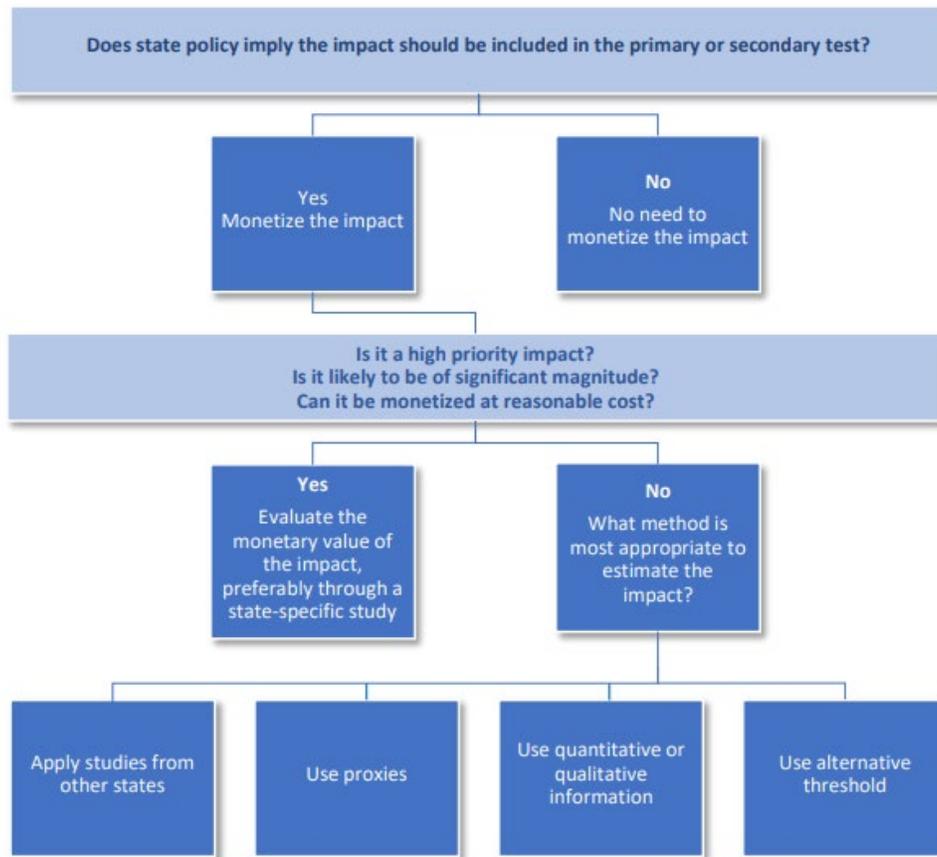
Table 3. Stakeholder support for including non-utility system impacts in primary or secondary tests

Non-Utility System Impact	Stakeholder Support	Test to Include the Impact
Other fuel	Strong	Primary and secondary
Water resource	Strong	Primary and secondary
Income eligible impacts (participant)	Strong	Primary and secondary
Environmental, NH fossil fuel proxy	Strong	Primary and secondary
Income eligible impacts (societal)	Moderate	Secondary only
Participant costs and non-energy benefits	Moderate	Secondary only
Environmental, other externalities	Moderate	Secondary only
Economic development and jobs	Moderate	Account for separately
Public health	Insufficient	Do not include
Energy security	Insufficient	Do not include

Source: 2019 B/C Working Group discussions.

4. **Ensure Impacts are Treated Symmetrically:** Synapse recommended including both costs and benefits for all relevant impacts included in any test used in NH, and to not exclude a cost or benefit because it is difficult to monetize, for example. Certain non-utility system impacts require care to ensure symmetry, such as if savings from other fuel are considered, so too should increases from other fuels.
  
5. **Account for Long-Term, Forward-Looking, Incremental Impacts:** The NH TRC is already forward-looking as it does not include lost revenue or sunk costs and considers marginal impacts by using incremental values quantified in an isolated future scenario without new EE investments. Utilities currently consider measures over 25-year measure lifespans, which Synapse recommends be extended for longer-term measure lives.
  
6. **Develop Methodologies to Account for Relevant Impacts:** Synapse highlights several challenges to accounting for all relevant impacts, including impacts that are *difficult to monetize* and/or quantify, the resources needed to account for impacts only included in *secondary tests*, and *evolution* in methodology and value over time. Methods to account for newly included, difficult to monetize impacts were beyond the scope of Synapse’s work with the B/C WG, but Synapse recommended the approach shown in Figure 2 for B/C WG consideration.

Figure 2. Determining how to account for Energy Efficiency Impacts



7. **Ensure Transparency:** The NSPM recommends a transparent process for CE policies, inputs, assumptions, and results. NH utilities currently share their test inputs and approaches in Microsoft Excel with open formulae and plan to train stakeholders on the models for the 2020 update. To increase transparency, Synapse recommends:
- Improving citations for model inputs
  - Making models publicly available in Microsoft Excel format with all formulae and cell references available

#### 4. A New Granite State Framework

The B/C WG process resulted in the development of a new CE framework, which includes a primary Granite State Test, a Secondary Granite State Test, and the Utility Cost Test as a secondary test.

##### a) Impacts Included in the new Granite State Test

As discussed in Section 3 above, Synapse recommended that the B/C WG update the state’s primary test to include all utility system impacts and remove participant impacts, in line with state policy goals. Synapse recommended that all non-utility system impacts be treated symmetrically and the model inputs be transparent. The updated primary Granite State Test is summarized in Table 4.

Table 4. Current and recommended cost-effectiveness test impacts for New Hampshire

Impact	Current NH TRC Test	Granite State Test	Secondary Test: Utility Cost Test	Secondary Test: Secondary Granite State Test
<b>Utility System Costs</b>				
Measure costs (utility portion)	✓	✓	✓	✓
Other financial or technical support costs	✓	✓	✓	✓
Other program and administrative costs	✓	✓	✓	✓
EM&V costs	✓	✓	✓	✓
Performance incentives	✓	✓	✓	✓
<b>Utility System Benefits</b>				
Avoided energy costs	✓	✓	✓	✓
Avoided generating capacity costs	✓	✓	✓	✓
Avoided reserves	✓	✓	✓	✓
Avoided transmission costs	✓	✓	✓	✓
Avoided distribution costs	✓	✓	✓	✓
Avoided T&D line losses	✓	✓	✓	✓
Avoided ancillary services		✓	✓	✓
Intrastate price suppression effects (DRIPE)	✓	✓	✓	✓
Interstate price suppression effects (DRIPE)				
Avoided compliance with RPS requirements	✓	✓	✓	✓
Avoided environmental compliance costs (embedded)	✓	✓	✓	✓
Avoided credit and collection costs		✓	✓	✓
Reduced risk	✓	✓	✓	✓
Increased reliability		✓	✓	✓
Market transformation		✓	✓	✓
<b>Non-Utility System Impacts</b>				
Other fuel	✓	✓		✓
Water resource	✓	✓		✓
Income eligible (participant)	✓	✓		✓
Income eligible (societal)				✓
Participant costs	✓			✓
Participant non-energy benefits	✓			✓
Environmental, NH fossil fuel proxy	✓	✓		✓
Environmental, other externalities				✓
Public health				
Energy security				

Source: 2019 B/C Working Group discussions.

Notes: The utilities partially account for participant non-energy benefits through a percentage adder in the current New Hampshire TRC Test.

b) **The Secondary Granite State Tests**

Synapse recommended that the B/C WG adopt two secondary tests: the Utility Cost Test (UCT) and Secondary Granite State Test, to “enhance regulators’ and stakeholders’ overall understanding of efficiency resource impacts by answering other questions that address how best to use ratepayer funding on energy resources” (pg. 53). Because NH policy was not always explicit, or because there was not sufficient justification to shift from historical practice, stakeholders deliberated on whether to include certain impacts. The value of these impacts was uncertain, and stakeholders can use secondary tests to better understand the sensitivity of results to (and implications of) these impacts.

***Impacts included in the Secondary Granite State Test***

Using the UCT and the Secondary Granite State Test provides what Synapse calls “two ends of the CE spectrum” including only utility system impacts and all impacts possibly relevant to NH, respectively. The Secondary Granite State Test includes the impacts in the Granite State Test as well as other impacts important to stakeholder and relevant to state policies: participant, income eligible societal, and other environmental externalities. Synapse recommends that even with the added impacts, the Secondary Granite State Test align with NSPM principles. This entails including all utility system impacts and non-utility system impacts relevant to state policies at the program level and treating them symmetrically (see Table 4 for illustration of impacts included in each test). The Secondary Granite State Test, like the Granite State Test, should also maintain NH’s current test practices: excluding lost revenues, calculating marginal impacts, using the low-risk discount rate, and monitoring free-ridership and spill-over rates. Other best practices Synapse recommends the state consider with regard to this test parallel those recommended for the primary test: extending measure life analysis, increasing transparency, and using dual baselines to calculate early replacement savings.

***Applying the Secondary Granite State Test***

Synapse recommended the Granite State Test alongside the Secondary Granite State Tests and UCT as a package of tests to use together. Whereas the primary Granite State Test is the “go-no go test” (pg. 59) to determine whether a program should be implemented, the secondary tests provide additional information to support decision-making when programs are borderline CE. Even when a program passes the primary test, secondary tests can help determine priority programs when EE funding is limited. In their recommendations, Synapse defines the use cases for UCT and Secondary GST respectively as

*If an efficiency resource passes the UCT, then the utility customer who pay for the resource will see benefits from the resource through reduced utility system costs that are equal to or greater than their contribution to the resource.*

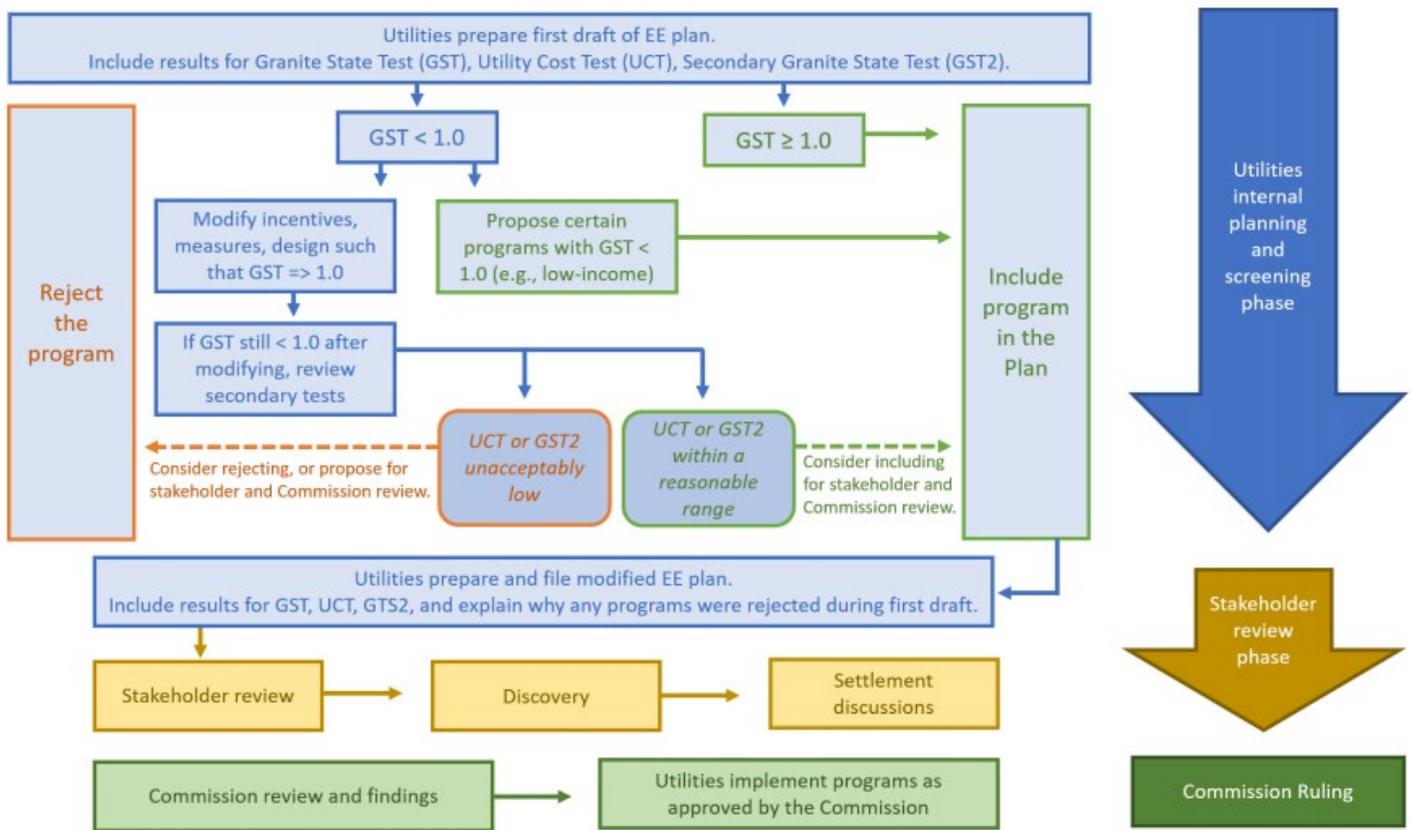
and

*[The SGST] can be used when stakeholders are interested in a range of considerations beyond the utility system, unregulated fuel, and income-eligible participant impacts*

included in the primary test, such as environmental, participant, or income-eligible societal impacts (pg. 60).

Per Synapse’s recommendations, each NH utility should transparently calculate and present all three tests for EE programs, although the results for the secondary tests “need only be considered on a limited basis” (pg. 61). The process of determining CE in NH is summarized in the flowchart in Figure 3.

**Figure 3. Cost-effectiveness tests flow chart**



**c) Other Cost-Effectiveness Testing Considerations**

***Rate, Bill, and Participation Impacts***

Rate, bill, and participation impacts provide a better understanding of the implications of EE resources; the extent to which customers will benefit from them and the extent to which they may affect distributional equity. Although these can help inform program priorities, design, and spending, Synapse notes that these considerations should be considered separately from CE tests.

### ***Economic Development and Job Impacts***

Synapse recommends that economic development impacts of EE resources at the state level be considered alongside cost-effectiveness analysis. Additionally, they recommend that economic development be indicated by number of jobs in job-years at the portfolio-level, similar to NH utilities' current quantification methodology.

### **Other Distributed Energy Resources**

Although Synapse and the B/C WG briefly discussed how these recommendations would affect other DERs, the current CE tests are recommended only for EE resources. The NSPM principles and framework are relevant to all DERs. Synapse recommends that stakeholders and the Commission consider whether all DERs should be subject to the same primary test, and then follow the NSPM process accordingly to review policies relevant to other DERs.

## **5. Conclusions**

Through the B/C WG's process, NH stakeholders discussed a new CE framework, consisting of the primary GST, the secondary GST and the UCT. Used together, these three tests will align with the NSPM to follow best practices in CE testing for EE resources. Changing to the new GST from the current modified TRC will entail some updates to NH CE testing, as follows:

- The new GST will include all utility-system impacts to represent the direct costs and benefits to customers that fund the energy efficiency resources.
- Non-utility system impacts which align with NH policy goals as reviewed by the B/C WG will be included in the new GST, even those that are difficult to quantify.
- Other non-utility system impacts on which alignment with NH policy goals was uncertain or which have historical relevance and/or importance to NH CE testing and stakeholders have been included in the state's secondary GST, to support (but not determine) decisions on resource allocation to EE programs.

Other recommendations from Synapse to update the test included ensuing transparency, extending measure life beyond 25 years to reflect longer measures, and considering economic development and rate, bill, and participation impacts separately from cost-effectiveness tests. Detailed in the report is how the recommendations treat discount rate, free-ridership and spillover, analysis period, assessment level, and analysis of early replacement.

The B/C WG submitted Synapse's report including recommendations for CE testing to the PUC in Docket 17-136 in October 2019 as part of a filing also containing [PUC Staff recommendations](#) (to adopt the Granite State Test and secondary tests) and an energy optimization study. In December 2019, the PUC issued [Order No. 26-322](#) requiring that the Granite State Test be adopted as the primary CE test, alongside the recommended Secondary Granite State Test and Utility Cost Test. The adoption of these new tests applies to the utilities' next triennial plan in 2021, following a 2020 bill impact analysis and the 2019 Energy Optimization Study.

## 6. References

B/C WG. (31 October 2019). B/C WG Recommendations Regarding NH CE Review and Energy Optimization through Fuel Switching Study, DE 17-136.

[https://www.puc.nh.gov/Regulatory/Docketbk/2017/17-136/LETTERS-MEMOS-TARIFFS/17-136\\_2019-10-31\\_STAFF\\_FILING\\_WORKING\\_GROUP\\_REC.PDF](https://www.puc.nh.gov/Regulatory/Docketbk/2017/17-136/LETTERS-MEMOS-TARIFFS/17-136_2019-10-31_STAFF_FILING_WORKING_GROUP_REC.PDF)

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