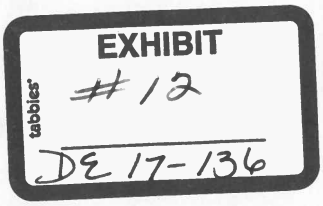

BEFORE THE STATE OF NEW HAMPSHIRE
PUBLIC UTILITIES COMMISSION

In the matter of:	)
New Hampshire Electric and Gas Utilities	)
Docket No. DE 17-136	)
2019 Update of 2018-2020 Statewide Energy Efficiency Plan	)

Direct Prefiled Testimony
Of
Jeffrey Loiter
Principal, Optimal Energy, Inc.

On Behalf of

The New Hampshire Office of the Consumer Advocate

November 2, 2018

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- **JML-20** New Hampshire Public Utilities Commission Staff Comments on Proposed Assumption for 2019 Plan. July 27, 2018. Available at: https://drive.google.com/file/d/1QcFdshH4Iq7ujC9FiYUfe0BLO8ZfdVtd/view?usp=sharing
- **JML-21** New Hampshire Office of the Consumer Advocate. History of the New Hampshire Total Resource Cost Test's Environmental Adder. Available at: https://drive.google.com/file/d/1PEKZSpx7W36I1KBbzFdPOv2H1OIphw05/view?usp=sharing
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- **JML-25** Connecticut 2019-21 Conservation and Load Management Plan. (October 2019) Page 198. Available at: https://app.box.com/s/01sqsrz8ccxd81f6t8iepfjwea24h4tw/file/317462078117
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- **JML-29** Connecticut 2019-2021 Conservation and Load Management Plan. Pages 80-93, 130-132. Available at: https://app.box.com/s/01sqsrz8ccxd81f6t8iepfjwea24h4tw/file/317462078117
- **JML-30** Vermont Public Utility Commission. Docket No. EEU-2018-03. Order Re: Development and Support Service Budgets, Evaluation Budgets, Other Program Budgets, Forecasts of Expected Savings, and Performance Targets. https://drive.google.com/file/d/14cM_AtyR2WH_K6O3SLPWOMQKCCqeT0Ll/view?usp=sharing
- **JML-31** New Hampshire Office of the Consumer Advocate. Comments on LBR Working Group Draft Report. (August 2018) Available at: https://drive.google.com/file/d/1fjjPqsFRcY7N3sr_Wx95KnOvb9MUzO1I/view?usp=sharing

- **JML-32** Joint Utilities. Comments on LBR Working Group Draft Report and Rebuttal to OCA Comments. (August 2018) Available at: https://drive.google.com/file/d/1ZS-P-7eoR2MOI5CAQYx6ueZlB2Jdv5SD/view?usp=sharing
- **JML-33** U.S. Department of Energy State and Local Energy Efficiency Action Network. Energy Efficiency Collaboratives: Driving Ratepayer Funded Efficiency through Regulatory Policies Working Group. (September 2015) Page 1, 5-6, 18-21, 36-38. Available at: https://www4.eere.energy.gov/seeaction/system/files/documents/EECollaboratives-0925final.pdf
- **JML-34** Connecticut 2019-2021 Conservation and Load Management Plan. Pages 126-129. Available at: https://app.box.com/s/01sqsrz8ccxd81f6t8iepfjwea24h4tw/file/317462078117
- **JML-35** Testimony of Richard D. Chin and Kevin J. Morley. Massachusetts Department of Public Utilities Docket No. 17-05. October 2, 2018. Available at: https://drive.google.com/file/d/1oMcxVyI2RUGHWA3etVvaOLTSOGL9JljR/view
- **JML-36** NSTAR Advanced Controls Tariff. Massachusetts Department of Public Utilities Docket No. 17-05. Available at: https://drive.google.com/file/d/1u0Wfe8D2r4EsF190G_T56nFeBvPcMFP-/view

1. INTRODUCTION AND SUMMARY OF RECOMMENDATIONS

Q. Please state your name and business address.

A. My name is Jeffrey Loiter and my business address is Optimal Energy, Incorporated, 10600 Route 116, Hinesburg, Vermont, 05461.

Q. On whose behalf are you testifying?

A. I am testifying on behalf of the New Hampshire Office of Consumer Advocate.

Q. Mr. Loiter, by whom are you employed and in what capacity?

A. I am a Partner in Optimal Energy, Inc., a consultancy specializing in energy efficiency and utility planning. In this capacity, I direct and perform analyses, author reports and presentations, manage staff, and interact with clients to serve their consulting needs. My clients include state energy offices and efficiency councils, utilities and third-party program administrators, and non-governmental organizations. For example, I participate on the consultant team supporting the work of the Massachusetts Energy Efficiency Advisory Council, which guides the development of energy efficiency plans by the state's investor-owned gas and electric utilities and energy providers and monitors the implementation of these plans. I have recently begun providing similar services to the newly-formed Delaware Energy Efficiency Advisory Council.

Q. Please summarize your work experience and educational background.

A. I have over 20 years of consulting experience in environmental policy, energy, and natural resource issues. For the past 11 years, I have been engaged in a variety of work at Optimal Energy related to energy efficiency program design and analysis. For example, I prepared two documents for inclusion in EPA's *National Action Plan for Energy Efficiency (NAPEE)*:

a guidebook on conducting efficiency potential studies, and a handbook describing the funding and administration of clean energy funds.

In my capacity as a Partner at Optimal, I also advise clients on efficiency program design and implementation. I have assisted with the design and development of statewide and utility-specific efficiency programs in Maine, Maryland, New York, Massachusetts, Rhode Island, and Tennessee. I currently support program implementation and on-going program design and development for Orange and Rockland Utilities in New York, and the Connecticut Municipal Electric Energy Cooperative. I have submitted written testimony to and/or testified before public utility commissions in Arkansas, Kansas, Kentucky, Maryland, Ohio, Virginia, and West Virginia on topics such as demand-side management, integrated resource planning, and efficiency as a resource in state energy plans.

Prior to joining Optimal Energy in 2006, I was a Senior Associate at Industrial Economics, Inc. in Cambridge, Massachusetts, where I supported state, federal, and international governmental clients with analysis on topics of environmental policy and natural resources damages. I have a *B.S. with distinction* in Civil and Environmental Engineering from Cornell University and an *M.S.* in Technology and Policy from the Massachusetts Institute of Technology.

Q. Have you previously testified before the New Hampshire Public Utility Commission ("the Commission" or "PUC")?

A. Yes. I submitted pre-filed direct testimony in Docket DE 15-137 and last year in DE 17-136. In addition, I have participated in several working groups related to both that docket and the current one.

Q: How is your testimony organized?

A: My testimony is organized into the following sections:

1. Introduction and Summary of Recommendations
2. Cost-Effectiveness Screening Recommendations
3. Performance Incentive Recommendations
4. Funding and Finance Recommendations
5. Lost Base Revenues Recommendations
6. Evaluation, Measurement, and Verification (EM&V) Recommendations
7. Program Design Recommendations
8. Conclusion and Summary of Recommendations

Q. Are you submitting attachments along with your testimony?

A. Yes. I have provided 36 attachments which are summarized after my table of contents and appended to my testimony. From what I understand, the New Hampshire Public Utilities Commission cannot click-through to file sharing servers where I have provided a shared link to references which are not currently available on the web, so I have included such references, as well as my resume and 19 relevant discovery responses, as attachments.

Q. Have you reviewed the 2019 Update to the 2018-20 Energy Efficiency Program Plan?

A. Yes I have.

Q. Has the Office of the Consumer Advocate and its consulting team participated in the working groups established by Commission Order No. 26,095, which approved the EERS Plan Settlement Agreement?

A. Yes. A representative of the Office of the Consumer Advocate, and occasionally its consulting team, has participated in the Evaluation, Measurement, and Verification (EM&V) Working Group, Benefit-Cost Working Group, Performance Incentive Working Group, and

the Lost Revenues Adjustment Mechanism Working Group. I attended some of those working group meetings and a representative of the OCA or their consulting team have conveyed to me their observations on others. In addition, I have reviewed many of the resulting documents and presentations generated by those groups, particularly on the topic of Lost Revenues. It appears that the collaborative manner in which the working groups have functioned to break down information asymmetries and identify consensus and non-consensus on certain topic areas was fruitful and it is within this context that I make recommendations based on the insights gleaned thus far through the working group process.

Q. Please provide an overview of the recommendations you make based on your review of the Draft 2019 Plan Update and your understanding of the working groups.

A. Below is a succinct summary of my recommendations, which I will elaborate on in the body of my testimony:

Cost Effectiveness Screening and Updated Avoided Energy Supply Cost Values

1. The Commission should accept the values included in the 2018 Avoided Energy Supply Cost Study ("AESC 2018" or "Study"), but as a condition of approval require the utilities to furnish transmission and distribution system data for the study's authors next time it is requested. I have no firm position at this time on the 2019 Plan's adoption of the value of reliability set forth in AESC 2018.
2. The Commission should accept the environmental externality benefits for fossil fuel savings that is included in the 2019 Plan.
3. The Commission should accept the additional ten percent low-income benefit adder included in the 2019 Plan and clarify that it expects the adoption of such an adder to lead

the utilities to serve more low-income participants than originally planned in the 2018-20 Plan, rather than fewer.

4. The Commission should direct the Benefit Cost Working Group, any successor, or the EM&V Working Group to study the regional trend toward energy efficiency programs claiming savings for fuel switching and make recommendations relative to that trend no later than June 2019. If a consultant is managed by the EM&V Working Group, the Commission should require that the consultant gather input from stakeholders outside the EM&V Working group, including the benefit cost-working group or any successor.
5. The Commission should direct the EM&V Working Group to solicit and oversee a consultant who will develop a report detailing application of the National Standards Practice Manual ("NSPM")'s Resource Value Framework ("RVF") in New Hampshire, and make recommendations relative to the RVF no later than June 2019. The Commission should require that any consultant gather input from stakeholders outside the EM&V Working group, including the benefit-cost working group or any successor.
6. The Commission should direct the EM&V Working Group to solicit and oversee a consultant who will provide a bill impact analysis for New Hampshire's 2019 ratepayer funded energy efficiency programs, including an analysis of bill impacts for participants, bill impacts for non-participants, and bill impacts for the average customer.

Performance Incentive

1. The Commission should provide direction regarding the new performance incentive proposal by the Joint Utilities and the alternative approach I will describe later, and direct the performance incentive working group or any successor to file recommendations by April 1, 2019.

2. If there are any non-consensus issues, the Commission should establish an expedited procedural schedule to resolve those issues that begins in early April 2019 and provides for a hearing by July 2019.

Funding and Finance

1. The Commission should direct the utilities to collect program funds at the rate of the previously-estimated SBC and to use these funds for a variety of program enhancements that do not directly result in electric or natural gas energy savings, but do provide a net benefit to New Hampshire's electric ratepayers. This would include additional capital for financing, a greater focus on peak demand reduction and unregulated fuels, and expanded pilot financing initiatives.

Lost Base Revenue Methodology

1. The Commission should direct the EM&V Working Group to solicit, contract with, and manage an independent consultant for a billing analysis of actual lost revenues for a statistically significant sample of New Hampshire ratepayers so that it can be compared with the results with projected lost revenues using the current methodology and the revised methodology as proposed by OCA's expert.

EM&V Working Group Recommendations

1. The Commission should direct the EM&V Working Group to explicitly outline a process for facilitating input on—and stakeholder understanding of—the potential study in the 2019 update of its' Strategic Evaluation Plan, beyond the existing communication channel provided by the EESE Board Representative on the EM&V Working group.

2. As suggested above, the EM&V Working Group could be a useful venue for discussion of a number of additional topics, including 1) a process to apply the NSPM to the development of a refined cost-effectiveness test for NH efficiency programs, 2) setting guidelines for how bill and rate impact analysis are conducted and presented, 3) resolving remaining issues related to the calculation of lost base revenue, particularly related to the lost revenue from demand-billed customers.

Program-based Recommendations

1. The Commission should direct the utilities to analyze the potential benefits of controllable domestic hot water heating and, if cost-effective, develop a strategy to use this resource.
2. The Commission should direct the utilities to pilot Strategic Energy Management in New Hampshire, even if only with one large customer.
3. The Commission should open an investigation into the street lighting tariffs offered by Unitil and Liberty, require the utilities to adopt tariff language permitting use of advanced lighting controls, declare Manchester's O&M pilot a success, and direct Eversource to offer it to all municipal customers.
4. The Commission should take a hard look at Eversource's Customer Engagement Platform and at the very least direct Eversource to investigate integrating Green Button "Connect My Data" functionality into the platform.
5. The Commission should direct the utilities to conduct a pilot assessment of energy efficiency as a non-wires alternative to distribution system investments, as further discussed in the testimony of OCA Witness Chris Neme.

2. COST EFFECTIVENESS SCREENING RECOMMENDATIONS

Q. Do you have any recommendations to make relative to cost effectiveness screening or the Benefit Cost Working Group?

A. Yes, I have several comments and recommendations related to the Commission Staff ("Staff") Comments on proposed assumptions for the 2019 Plan that flow from AESC 2018 and various working group discussions of adders, as well as other aspects of cost-effectiveness screening. I will start my discussion of these recommendations with a brief recap of the tasks of the working group outlined in the DE 17-136 settlement agreement and assigned to the group by Commission Order No. 26,095.

Benefit Cost Working Group Tasks

The settlement directed the Benefit Cost Working Group to "Discuss elements and issues related to New Hampshire's benefit/cost test, as well as results from the in-progress AESC Study, and make recommendations for adjustments in future annual Plan Updates or Three Year Plans."[1] The settlement also directed the group to examine:

1. Whether it is appropriate to adopt an income-eligible adder for inclusion in the TRC test, separate from the portfolio-wide 10 percent adder adopted in the Plan, and, if so, the level of such low-income adder;
2. Whether the New Hampshire-specific [non-energy impact (NEI)] studies undertaken pursuant to this Settlement should include a separate, evidence-based, income-eligible NEI study; and

[1] New Hampshire Public Utilities Commission. Docket No. 17-136, Settlement Agreement at 11. Available at: https://puc.nh.gov/Regulatory/Docketbk/2017/17-136/LETTERS-MEMOS-TARIFFS/17-136_2017-12-08_LIBERTY_SETTLEMENT_AGREEMENT.PDF

3. Whether any adder adopted in this proceeding should be extended through the 2020 program year until such time as the above NEI studies are substantially completed and New Hampshire-specific NEI values are either adopted or rejected by the Commission, and if adopted, implemented in a timely manner.[2]

Discussions of the working group thus far have focused on whether and to what extent various avoided cost inputs should be adopted moving forward, including rest-of-pool DRIPE, various NEIs, and the possibility of adopting an income-eligible NEI adder that is based on evidence from other jurisdictions, rather than primary research in New Hampshire. The working group also hosted a presentation by Tim Woolf regarding the Resource Value Framework set forth in the recently published National Standards Practice Manual.[3] After six meetings of the Benefit Cost Working Group, the Commission Staff circulated Comments on proposed assumptions for the 2019 Plan to the working group members on July 27, 2018.[4]

Staff Comments on AESC Values

Through its July 27 comment letter, Staff expressed support for the majority of the assumptions within the AESC 2018,[5] including new avoided cost inputs such as transmission capacity based on Pool Transmission Facilities (PTF) and zone-on-zone oil Demand Reduction Induced Price Effects ("oil DRIPE"), but did not agree to the adoption of avoided costs related to reliability. I agree with Staff's support for the PTF and zone-on-zone oil DRIPE avoided costs included in AESC 2018. As to Staff's somewhat qualified support of

[2] *id*. at 4.
[3] Woolf, T. Presentation to the New Hampshire EERS Benefit Cost Working Group on the National Standard Practice Manual. (March 2018) Available at: https://www.puc.nh.gov/EESE%20Board/EERS_WG/3_15_18_nspm-nh-eers.pdf
[4] New Hampshire Public Utilities Commission Staff Comments on Proposed Assumption for 2019 Plan. July 27, 2018. Available at: https://drive.google.com/file/d/1QcFdshH4Iq7ujC9FiYUfe0BLO8ZfdVtd/view?usp=sharing
[5] Avoided Energy Supply Components in New England: 2018 Report, Initial Release - March 30, 2018; Amended-June 1, 2018. http://www.synapse-energy.com/project/aesc-2018-materials

the PTF value of $94/kW-year and request for further information, I note that the Study clearly describes the calculation of this value and the basis for the various inputs, and furthermore that the Study was subject to a collaborative stakeholder process in which this Commission and commission staff from throughout New England participated.

At this time, I have no firm position on the inclusion of a value for increased reliability. Based on the Joint Utility response to OCA 2-005,[6] the value of reliability included in the Plan Update is likely to be a small fraction of the total benefits calculation, although further research on this topic is warranted, as suggested by Staff. A recent report from the American Council for an Energy Efficiency Economy (ACEEE) reviewed current approaches to quantifying the value of reliability, including in neighboring in Vermont.[7] These indicated values of comparable magnitude to the values presented in the AESC.

I also wish to raise an issue related to the PTF value. As described in the AESC, the PTF value only accounts for some of the transmission costs in New England. Program administrators can still add other avoided distribution and non-PTF transmission avoided costs if available, taking care to include only local transmission investments to avoid double-counting. With respect to these non-PTF costs, it is unclear what amount, if any, would be appropriate to include in New Hampshire's avoided costs. In attempting to analyze these avoided distribution and local transmission costs, the Study authors attempted to collect data from New Hampshire utilities, as described below.[8]

> We have not reviewed any avoided T&D analyses from Eversource's Massachusetts and New Hampshire subsidiaries, the Maine utilities, or Vermont. We have reviewed some

[6] Response OCA 2-005(a) Available at: https://tinyurl.com/17-136-OCA-2-005 (Suggesting the 2019 Plan Update includes the reliability value set forth in AESC 2018 at page 220, which is "$0.65/kW-year for cleared resources and $6.60/kW-year for uncleared load reductions.")
[7] Relf, G. (et al.). American Council for an Energy Efficient Economy. Keeping the Lights On: Energy Efficiency and Electric System Reliability. (October 2018) Page 21-26. Available at: https://aceee.org/research-report/u1809
[8] Supra. at note 5. Page 206.

> data for these utilities on the load growth and avoidable costs in some congested areas that may be suitable for targeted distributed resource solutions in pending New Hampshire pilot programs. But we have not found any computations of general avoided T&D costs for energy efficiency screening.

The Joint Utilities responses to OCA 2-004 confirm that neither Eversource nor Liberty Utilities provided the Study authors with relevant data.[9] This is in contrast to Eversource Connecticut, whose data were provided and are described in detail in the Study. For future AESC updates, the Commission should require all New Hampshire utilities to work with the Study authors to provide greater visibility into their projected transmission and distribution costs so that they are accurately and appropriately considered in developing an overall avoided cost value for New England. I note that Eversource recently filed a marginal cost of service study at the direction of Commission Order No. 26,029; that study's supporting work papers could be used to help inform any updates to AESC 2018.[10]

Staff Comments on Fossil Fuel and Low-Income Benefit Adders

Outside of the AESC values, Staff's memo also expressed support for an environmental adder for fossil fuels, but rejected proposals from members of the working group in favor of a low-income NEI adder. I support including a value for avoided environmental externalities regardless of fuel type. For electric energy savings, the AESC avoided costs already include the value of avoided carbon emissions as derived from the Regional Greenhouse Gas Initiative (RGGI) framework. As described in response to discovery, the Joint Utilities demonstrated how, rather than using a simple percentage adder, they derived estimates of

[9] Response OCA 2-004. Available at: https://tinyurl.com/17-136-OCA-2-004 (Stating a "concern[] that if these internal documents had been provided, they could be shared with the members of the AESC Study Group per the terms and conditions of the contract with Synapse and would be used by Synapse or others to support conclusions about work that may or may not be needed or undertaken and costs that may or may not be incurred.")
[10] Eversource Energy's Marginal Cost of Distribution Service Study and Use for Efficient Rates. (July 2018) Available at: http://www.puc.state.nh.us/Regulatory/Docketbk/2016/16-576/LETTERS-MEMOS-TARIFFS/16-576_2018-07-16_EVERSOURCE_MARGINAL_COST_SERVICE_STUDY.PDF

environmental benefits for natural gas and fossil fuels directly from the same RGGI data used for electric energy benefits, using appropriate emission rates for each fuel.[11]

This additional benefit for fossil fuel environmental externalities complies with the Commission's intent as expressed in various orders throughout the history of the Commission's energy efficiency programs. The OCA examined various Commission Orders, Settlements, and other evidence regarding previous guidance of the Commission relative to the environmental adder and compiled the relevant excerpts in a brief history of the environmental adder.[12] There is extensive precedent before this Commission that supports accounting for environmental benefits under the Total Resource Cost test, particularly for fossil fuels.[13]

With regard to Staff's position on the additional NEI adder for the low-income sector, I acknowledge that an evaluation being performed by a third-party contractor to determine the value of various non-energy benefits associated with New Hampshire's Home Energy Assistance program is not yet complete. In the meantime, I believe there is ample evidence from other jurisdictions that programs for low-income customers generate some amount of benefit specific to those activities, above and beyond any other NEIs that accrue to energy savings from programs of all kinds. Even if these LI-specific benefits cannot yet be quantified, zero is clearly the wrong value. Therefore, it is appropriate to include a

[11] Response OCA 2-006
[12] New Hampshire Office of the Consumer Advocate. History of the New Hampshire Total Resource Cost Test's Environmental Adder. Available at: https://drive.google.com/file/d/1PEKZSpx7W36I1KBbzFdPOv2H1OIphw05/view?usp=sharing
[13] The Commission had previously embraced a 15 percent electric program adder in November 2000 and a separate 15 percent adder for gas programs in December 2002. The joint utilities proposed to discontinue the 15 percent electric program adder in 2008 because those costs because AESC 2007 included market-based price proxies for power plant emissions of NOx, SO_2, mercury and CO_2. No such proposal, justification, or resulting Commission Order exists discontinuing the gas program adder.

conservative adder to account for these benefits. The ten percent adder proposed by the NH Utilities is not at all unreasonable when viewed in this light.

An additional ten percent NEI adder would allow the NH Utilities to include additional measures, thereby better matching the available services to customers' needs and potentially increasing the savings realized from each participant. On the other hand, because the utilities have generally treated the 17 percent funding requirement as a fixed target rather than a floor, this could result in serving fewer participants.[14] The table below summarizes low-income weatherization waiting list numbers presented by the joint utilities in July 2018, and would suggest that serving more, rather than fewer households, should be a priority for the HEA program.[15] To the extent that the additional 10 percent adder makes it feasible to serve more customers whose participation would otherwise not be cost-effective, this could help alleviate some of this backlog. In particular, shell measures that increase fossil fuel savings and that are often only marginally cost-effective, could now be implemented with less detriment to the overall portfolio benefit-cost ratio. As such, the Commission should clarify that it expects the adoption of such an adder to lead the utilities to serve more low-income participants than originally planned in the 2018-20 Plan, rather than fewer. As I will address later, the 17 percent funding number should be a *floor* for the program administrators to receive *any* performance incentive, rather than a firm target.

[14] This concern is tempered by the fact that there is an $8,000 cap on basic program services per participating household, or a $16,000 cap for those households receiving both electric and gas services. Notably though, funds utilized for space heating and water heating equipment replacements do not count against these caps.
[15] New Hampshire Joint Utilities. Home Energy Assistance Program Stakeholder Meeting Presentation. (July 2018) Slide 18-21. Available at:
https://drive.google.com/file/d/1uQ8YsNtE6eHkfFHP6QFb5d21QQzNXe2d/view?usp=sharing

Population Type	2018 Population
Households at or Below 200% Federal Poverty Level	112,700
Households qualified for Fuel Assistance Program	29,791
Households Requesting Weatherization	8,268
Households Served by Program Annually	1,091

Q: Do you have any further comments relative to cost effectiveness screening that were not covered in Staff's memo?

A: Yes, I would like to highlight two trends in the region and suggest the Commission direct the Benefit Cost Working Group or any successor to review these trends and file recommendations by June 2019 so that they may be incorporated into the 2020 plan and the Potential Study the EM&V Working Group will oversee in 2019. I will also comment on the analysis of bill impacts in the plan updates as compared to best practices in the National Standards Practice Manual (NSPM), which since its May 2017 publication has been widely referenced or adopted in various state regulatory proceedings related to cost-effectiveness.[16]

Cost-Effectiveness Trend 1: Unregulated Fuel Savings and Fuel Switching

New Hampshire's statewide energy efficiency programs have supported fuel neutral weatherization and retrofits through the HEA and HPwES programs for several years.[17] With regard to air source heat pumps, heat pump water heaters, and ductless mini-split heat pumps, the Core programs appear to have accounted for the benefits and costs of fuel switching by claiming positive fossil fuel (i.e., MMBtu) savings and negative electric (i.e., kWh) savings

[16] National Standards Practice Manual References. (August 2018) Available at: https://nationalefficiencyscreening.org/wp-content/uploads/2018/05/NSPM-References-August2018.pdf
[17] Summary of CORE Program Policies and Precedents Relative to Beneficial Electrification. Available at: https://drive.google.com/file/d/1CrbdCjalZ92sr23TgQMTB2SIx1Noi3uO/view?usp=sharing

as recently as program year 2013.[18] However, this practice ended with the 2014 Plan Update's revision of savings and incentive levels to "bring them in line with standard practice in other northeast states."[19] Currently, I believe that program administrators in four out of six New England states assume a standard efficiency heat pump as the baseline heating equipment rather than a fossil fuel appliance, regardless of the existing system in the customer's home, and therefore do not count energy savings from reduced consumption of fossil fuels.[20]

Nevertheless, some jurisdictions are beginning to re-examine those assumptions as a means of more accurately assessing the benefits that result when a program administrator incents a participant to switch from an unregulated fuel (i.e., heating oil, propane, or kerosene) to electricity as their primary heating source. For example, the Massachusetts Program Administrators ("PAs") recently commissioned a study related to attribution of savings from fuel-switching measures.[21] In Rhode Island, the 2018 Energy Efficiency Program Plan embraced "electric ductless cold climate heat pumps for…oil fuel switching, oil fuel switching replace on failure, and electric resistance fuel switching."[22] In Vermont, Act 56 established a new tier of the state's Renewable Portfolio Standard that requires

[18] Joint Utilities. 2015-16 Energy Efficiency Program Plan. Bates 199. Available at: https://www.puc.nh.gov/Electric/NH%20EnergyEfficiencyPrograms/14-216/14-216%202014-12-11%20PSNH%20Att-Jt%20Settlement%20Agreement.pdf; *See* also, Response to OCA 2-027

[19] Joint Utilities. 2013-2014 Energy Efficiency Program Plan 2014 Program Update. Bates 006. Available at: http://www.puc.state.nh.us/Regulatory/Docketbk/2012/12-262/LETTERS-MEMOS-TARIFFS/12-262%202013-09-13%20NH%20CORE%20UTILITIES%202014%20ENERGY%20EFFICIENCY%20PROGRAM%20UPDATES.PDF21%20EXH%202%20PSNH%20MERGED%20ATTACHMENT%20A%20AND%20B%20TO%20SETTLEMENT%20AND%20UPDATED%20TO%20INCLUDE%20LATEST%20CORRECTIONS.PDF

[20] Levin, E. Vermont Energy Investment Corporation. Efficiency and Electrification: Strategic Partners. September 21, 2018. Slide 12. (Showing Vermont and Rhode Island as the only states in New England that include retrofit fuel savings in their savings assumptions for heat pumps) Available at: https://drive.google.com/file/d/1sJFwz4z9ohqFLqQeZ-TRb6oh1AMDm8fM/view?usp=sharing

[21] Memorandum re: Initial Considerations for Attribution/Net-to-Gross Estimation for Energy Optimization (TXC56), http://ma-eeac.org/wordpress/wp-content/uploads/TXC_56_-EnergyOptMemo_REVISED_FINAL_20Sept2018.pdf

[22] Rhode Island Annual Energy Efficiency Plan for 2018 Settlement of the Parties. Attachment 1 Page 39. Available at: http://rieermc.ri.gov/wp-content/uploads/2017/11/4755-ngrid-eepp2018_11-1-17.pdf

distribution utilities to procure a steadily increasing portfolio of fossil fuel reduction projects—primarily through fuel switching—which would be screened against an alternative compliance payment of $0.06/kWh. Notably, early analysis provided by the Vermont Department of Public Service suggested that this "Energy Transformation" tier had the potential to lower electric rates in the long-term, based largely on the ability to improve load factor and recover fixed system costs over a larger volume of energy sales.[23] In New York, the Public Service Commission has suggested that converting space heating and domestic hot water systems to highly-efficient electric units will improve system load factor by "spreading the cost of the electric system across a greater number of sales units, with resulting savings for customers both in the form of immediate savings and also by reducing long term business risks for utilities."[24]

In light of the aforementioned developments in the region, we recommend the Commission direct the Benefit-Cost Working Group, any successor, or the EM&V Working Group to review how other commissions and program administrators are accounting for the effects of fuel-switching promoted by energy efficiency programs. This review should include both how fuel-switching is treated in cost-effectiveness testing and how, if at all, the impacts of a fuel-switch measure are counted towards (or against) energy savings targets. Because fuel-switching could represent substantial energy savings, it should be considered as part of the soon-to-be developed potential study. I am concerned that, in response to an OCA data request, the joint utilities characterized discussions around fuel switching as "related to future policy" and that they "will be incorporated into the planning process for the 2021-2023

[23] H. 40 Renewable Energy Standard and Energy Transformation (RESET) Program. Available at: https://legislature.vermont.gov/assets/Documents/2016/WorkGroups/House%20Commerce/Bills/H.40/Witness%20Testimony%20and%20Comments/H.40~Rebecca%20Ellis~Notes%20Regarding%20H.40~2-24-2015.pdf
[24] New York Public Service Commission. Order Adopting a Ratemaking and Utility Revenue Model Policy Framework. Page 90. Available at: https://tinyurl.com/17-136-NYREV-Track-2-Order

program cycle."[25] This timeline precludes consideration of related savings in the Potential Study the EM&V Working Group will oversee in 2019. Therefore, recommendations on this topic in the near term—i.e., by June 2019—should be a key priority for the Commission, Staff, OCA, and other stakeholders.

Cost-Effectiveness Trend 2: Resource Value Framework

Second, several neighboring states are beginning to move away from the traditionally rigid TRC and the outdated California Standard Practice Manual (last updated over 15 years ago) and instead embrace the Resource Value Framework ("RVF") set forth in the NSPM. For example, the Rhode Island Public Utilities Commission is in the midst of a process to determine the appropriate costs and benefits for any energy investment made within the distribution system, based primarily upon the RVF.[26] In Connecticut, the Department of Energy and Environmental Protection is in discussions with the utilities regarding development of a resource value test based on the NSPM[27] and held a public meeting on the topic in September, with another scheduled for mid-November.[28]

Minnesota is also in the process of adopting the RVF, and the Minnesota Department of Commerce recently oversaw the development a report on the application of the National

[25] Response to OCA 2-009. Available at: https://tinyurl.com/17-136-OCA-2-009
[26] See Generally, Rhode Island Public Utilities Commission Docket No. 4600, 4600-A, and 4684.
[27] Connecticut 2019-21 Conservation and Load Management Plan. (September 2019) (Stating: "DEEP has initiated discussions with the Companies on the development of a Resource Value Test ("RVT") consistent with the SPM to reflect State policy goals outlined in the 2018 CES. The RVT could provide more appropriate methodologies to screen measures (e.g.,high-efficiency heat pumps) that offer customers energy savings and have environmental attributes(e.g., GHG emissions, water savings, etc.) consistent with the strategies outlined in the 2018 CES") Page 198. Available at: https://app.box.com/s/01sqsrz8ccxd81f6t8iepfjwea24h4tw/file/317462078117
[28] Connecticut Energy Efficiency Board Monthly Meeting. (Agenda Item 2C, stating "DEEP summary of schedule and process for cost-effectiveness testing public meetings on September 13 and in mid-November") Available at: https://app.box.com/s/01sqsrz8ccxd81f6t8iepfjwea24h4tw/file/317595035781

Standard Practice Manual to Minnesota.[29] This report could serve as a template upon which the EM&V Working Group bases an RFP for a similar report on the application of the RVF to New Hampshire. It is important to note that while the EM&V Working Group would manage the study, efforts should be made by the selected contractor to gather input from a wide range of stakeholders outside that working group, including those stakeholders represented in the benefit-cost working group or any successor.

In response to an OCA data request, the joint utilities characterized application of the National Standards Practice Manual as a discussion "related to future policy goals and objectives [that]… will be incorporated into the planning process for the 2021-2023 program cycle."[30] Even more so than fuel-switching, the cost-effectiveness screening framework will be a key aspect of determining the economically achievable energy efficiency potential, and therefore development of recommendations on this topic in the near term should also be a key priority for the Commission, Staff, OCA, and other stakeholders.

I will also point out for the Commission that Mr. Chris Neme, one of the primary authors of the NSPM, is also a witness on behalf of the OCA and will be submitting testimony in this docket on the topic of non-wires alternatives for distribution system investments.

Bill Impact Analysis Best Practices

Additionally, while on the subject of the NSPM, I note for the Commission that Appendix C of the NSPM contains extensive guidance on evaluating the rate impacts of energy efficiency programs. This guidance was the discussed in recent presentations by Tim

[29] Minnesota Department of Commerce. Updating the Energy Efficiency Cost-Effectiveness Framework in Minnesota: Application of the National Standard Practice Manual to Minnesota (August 2018) Available at: https://drive.google.com/file/d/1CHJz7To1Wsu2w2GFhmyA1dWIgSnUZPel/view?usp=sharing
[30] Response to OCA 2-009. Available at: https://tinyurl.com/17-136-OCA-2-009

Woolf to both the Benefit-Cost Working Group[31] and the EESE Board.[32] Currently, the NH Utilities' plans only present rate impacts associated with the system benefits charge and LDACs that collect the funds to implement the efficiency programs. These are misleadingly labeled as bill impacts.[33] Furthermore, the NSPM clearly indicates that an appropriate analysis of the impacts of efficiency programs on customers should include rate impacts, bill impacts, and participation impacts. Rhode Island may provide the best example of such an analysis, which National Grid includes in each annual plan update settlement, and which I have partially excerpted below for illustrative purposes.[34]

Table 2: Residential Bill Impact Analysis – A16 (2018 EE Plan vs. No EE)

Residential	Long-Term Rate Impacts	Typical Energy Savings	Typical Bill Savings
	(% of Total Rate)	(% per Participant)	(% of Total Bill)
Average Participant	1.31%	2.02%	1.56%
Non-Participant	1.31%	0.00%	-1.31%
Average Customer	1.31%	1.87%	1.35%

Table 3: Income-eligible Bill Impact Analysis – A60 (2018 EE Plan vs. No EE)[4]

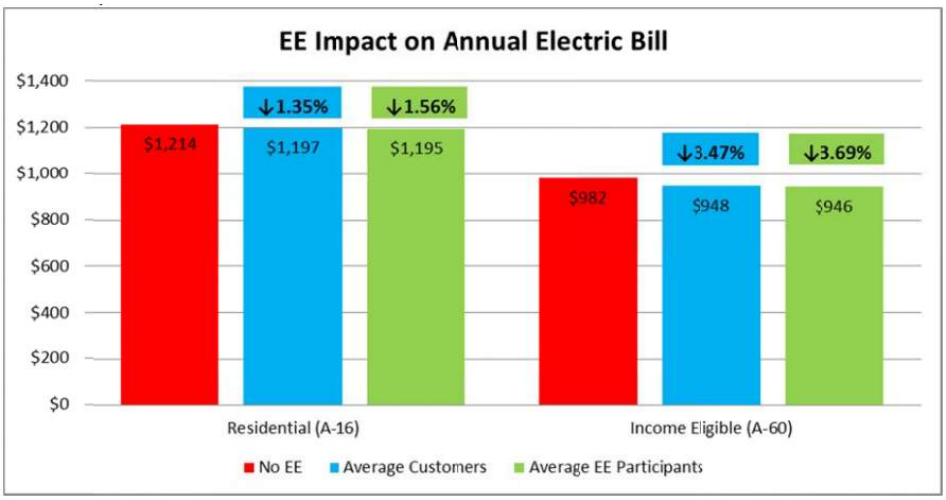
Income-Eligible	Long-Term Rate Impacts	Typical Energy Savings	Typical Bill Savings
	(% of Total Rate)	(% per Participant)	(% of Total Bill)
Average Participant	1.82%	4.06%	3.69%
Non-Participant	1.82%	0.00%	-1.82%
Average Customer	1.82%	3.90%	3.47%

[31] Woolf. T. Synapse Energy Economics. Presentation to the New Hampshire EERS Benefit-Cost Workgroup on the National Standard Practice Manual for Energy Efficiency Cost-Effectiveness. (March 2018) Available at: https://www.puc.nh.gov/EESE%20Board/EERS_WG/3_15_18_nspm-nh-eers.pdf

[32] Woolf. T. Synapse Energy Economics. Presentation to the New Hampshire Energy Efficiency and Sustainable Energy Board (May 2018) Available at: https://www.puc.nh.gov/EESE%20Board/Meetings/2018/051818mtg/nspm_nh_eese051818.pdf

[33] Joint Utilities' 2018-20 Energy Efficiency Program Plan. (December 2017) Pages 249, 286, 313, and 345. Available at: https://www.puc.nh.gov/Regulatory/Docketbk/2017/17-136/INITIAL%20FILING%20-%20PETITION/17-136_2017-09-01_NHUTILITIES_EE_PLAN.PDF

[34] Rhode Island Energy Efficiency Plan for 2018 Settlement of the Parties. November 1, 2017. Attachment 7, Page 1-10. Available at: http://rieermc.ri.gov/wp-content/uploads/2017/11/4755-ngrid-eepp2018_11-1-17.pdf



I recommend that the Commission direct the EM&V Working Group to solicit and oversee a similar analysis for the 2019 Plan. Ideally, each utility would be able to conduct this analysis and update it on an annual basis for inclusion along with future Plan updates.[35] An initial step in this direction could be that Eversource prepare an analysis for their electric portfolio and Liberty prepare one for its gas portfolio, which collectively cover the vast majority of regulated energy usage in the state.

3. PERFORMANCE INCENTIVE RECOMMENDATIONS

Q: Do you have any recommendations to make relative to the Performance Incentive Working Group?

A: Yes, but first I will offer comment on the working group and its assigned tasks, a summary and assessment of the current performance incentive, performance incentive revision consensus areas, the joint utilities' recommendations, and then I'll provide my suggestions for the group moving forward.

[35] *Id*. at Attachment 7 Page 2 (pdf page 301), Stating: "The electric bill impact models used to generate the electric results were adapted from models originally built by Synapse Energy Economics on behalf of the Division of Public Utilities and Carriers in 2013."

Performance Incentive Working Group Tasks

The discussions of the performance incentive working group, like all of the other working groups, have been an effective means of breaking down information asymmetries and building consensus. The DE 17-136 Settlement Agreement states that the performance incentive working group "shall be formed in 2018 to review potential PI calculation methodologies that could further promote the achievement of New Hampshire's EERS goals… [and] shall make recommendations for the 2020 Plan Update." The Settlement also identifies likely candidates for study by the group as including but not limited to "metrics to cover income eligible participation and peak load reductions."[36]

Summary and Assessment of Current Performance Incentive

The current performance incentive for the electric energy efficiency programs is calculated on a sector specific basis,[37] and based on four factors:[38]

1. Whether the electric lifetime savings equals 55 percent or more of total lifetime energy savings;[39]
2. The actual dollars spent;
3. The predicted benefit-to-cost ratio compared to the actual benefit-to-cost ratio; and

[36] The Commission adopted the settlement agreement in docket DE 17-136 in Order No. 26,095.
[37] To be eligible for a performance incentive for a specific sector, the program administrators must achieve a benefit-to-cost ratio of greater than 1:1 in that sector and achieve actual lifetime kWh/MMBtu savings at or above 65% of the predicted savings.
[38] Joint Utilities. 2018-20 Plan at 173-175. Available at: https://www.puc.nh.gov/Regulatory/Docketbk/2017/17-136/INITIAL%20FILING%20-%20PETITION/17-136_2017-09-01_NHUTILITIES_EE_PLAN.PDF
[39] This is meant to focus the majority of the SBC-funded budget towards electric savings rather than gas and other fossil fuel savings. If at least 55% of the overall energy savings are in the form of electric energy, then the utility earns PI using the higher 2.75 multiplier. If less than 55% of the overall savings are from electric energy, then the utility earns PI using the lower 2.2 multiplier. The 55% electric savings threshold also determines the overall performance incentive cap; if the 55% threshold is reached, the maximum PI is 6.875% of actual expenditures, otherwise it is 5.5% of actual expenditures. The two halves of the PI based on the ratio of actual to projected electric energy savings and benefit-cost ratio are also capped at half of the applicable total PI cap.

4. The predicted lifetime electric energy (kWh) savings compared to the actual lifetime electric energy (kWh) savings.

The performance incentive formula that ties these factors together is as follows:

(1) (2) (3) (4)

PI= [(2.75% *or* 2.2%) x Actual Spend] x [(BCR Actual/BCR Predicted) + (kWh Actual/kWh Predicted)]

The performance incentive for the natural gas programs is similar, but the incentive percentage and total PI cap is not dependent on achieving a minimum portion of total energy savings from gas measures. It is calculated as follows:

(1) (2) (3) (4)

PI= [2.75% x Actual Spend] x [(BCR Actual/BCR Predicted) + (MMBtu Actual / MMBtu Predicted)]

After months of working group meetings meant to examine the actions that the current performance incentive either encourages or discourages, we have come to the conclusion that, while well intentioned, the "actual v. predicted ratio" component of the performance incentive included in factors three and four creates a perverse incentive for the program administrators to plan for much lower savings and targets than they know they are able to achieve. That is, this performance incentive mechanism creates a disincentive in the planning process for the program administrators to truly target all cost-effective energy efficiency in compliance with the Commission's previous directives in Order No. 25,932. For example, the table below documents the NH Utilities achievement in lifetime energy savings as a percentage of the planned savings for the electric efficiency programs over the past four years. While the program administrators should be commended on a record of success, such a consistent trend looks to me like under-planning as much as over-achievement.

Planned v. Actual Electric Lifetime Savings Over Time		
	Savings % of Goal	**Source**
2017	140%	Q4 2017 Report
2016	136%	Q4 2016 Report
2015	136%	Q4 2015 Report
2014	140%	Q4 2014 Report

The consistency with which the electric program administrators have been able to outperform their planned lifetime electric energy savings seems to indicate that it would be prudent for the Commission to re-examine the incentive structure and how it might encourage the electric program administrators to plan for savings that are more closely aligned with those they have previously been capable of achieving.[40]

I also believe that the 55% electric savings requirement, while well intentioned, serves to artificially limit program design in a manner that might be to the overall detriment of ratepayers. It is important to support the willingness of stakeholders to incorporate fuel-blind measures as a central component of the SBC-funded electric efficiency programs; it is equally important to recognize that there is a benefit in prioritizing electric savings within programs that are funded by electric bills. Nevertheless, I agree with the expert analysis provided by the Vermont Energy Investment Corporation which suggested that the 55 percent threshold could limit comprehensive fuel-neutral services, likely "discouraging electric utilities from aggressively serving low-income customers, who typically have high thermal savings."[41] The utilities seem to suggest as much in discovery, stating that "The

[40] It should be noted that this trend is not as consistent for the gas utilities' energy savings.
[41] Levin, E. Vermont Energy Investment Corporation (VEIC). VEIC Review of 2018-20 NH Statewide Energy Efficiency Plan: Performance Incentives. (May 2017) Available at: https://www.puc.nh.gov/EESE%20Board/Meetings/2017/071117EERSMtg/VEIC%20Draft%20Plan%20Review%20PI%207-11-17.pdf

CAAs follow the same prioritization rules in HEA as those used with the DOE Weatherization Assistance Program… [but] for jobs with HEA funds only, the utility could request additional prioritization based on high electric use or other customer need."[42] The proposed Quantitative Performance Indicator (QPI) based incentive structure I will describe later removes this requirement in favor of other more flexible portfolio-wide metrics that focus attention on electric savings.

Performance Incentive Revision Consensus Areas

At this time, there seems to be consensus from many of the stakeholders that the performance incentive mechanism can be improved. For example, the utilities have suggested areas for adjustment that include: (1) PI based on total portfolio results, rather than sector-by-sector; (2) benefit-cost ratio as a threshold criterion to be met, rather than a component of the PI calculation; (3) including net benefits (in dollars) as a component of the PI calculation; (4) using planned portfolio budget rather than actual program expenditures; and (5) changes to the 55% electric savings threshold requirement.[43] No member of the working group appeared to express strong opposition towards considering these changes.

I agree with the suggested areas for adjustment. Shifting the cost-effectiveness screening threshold from the sector level to the entire portfolio would allow the program administrators the flexibility they need to innovate and pilot new programs. Utilizing the benefit-cost ratio as a threshold criterion rather a component of the PI calculation would more closely align with the best practices of neighboring jurisdictions. Further, because the program

[42] Response to TWH 2-010. Available at: https://tinyurl.com/17-136-TWH-2-010;
see also, Response to TWH 2-011. Available at: https://tinyurl.com/17-136-TWH-2-011 (Stating: "If the average project has been coming in with a B/C ratio lower than the planning number used to set the filing goal, the implementation staff may inform CAAs that they need to aim for a higher B/C on remaining jobs.")
[43] Joint Utilities. Performance Incentive Working Group Update. (May 2018) Slide 5. Available at: https://drive.google.com/file/d/1rBN2gq4uZarUA8ioro_oF3eGSoQZVDS-/view?usp=sharing

administrators are the party that both determines the predicted benefit-cost ratio and evaluates the actual cost-benefit ratio, including it within the performance incentive calculation risks setting the target too low, as I demonstrated earlier. And although it may suffer from the same drawback, I believe there could be some value in including total resource benefits as a component of the performance incentive calculation. Such an approach would align well with best practices identified in Massachusetts and Vermont.[44] Basing the performance incentive on the budgeted program cost rather than actual spending provides greater certainty for both the utilities and the regulators as to the available performance incentive "pot." For the reasons discussed in the previous section, I also agree that the 55% threshold is more detrimental than beneficial to residential ratepayers. Additionally, I note for the Commission that the consultants who facilitated the 2018-20 Plan's initial review seemed agree with the majority of the suggested areas for adjustment now suggested by the program administrators.[45]

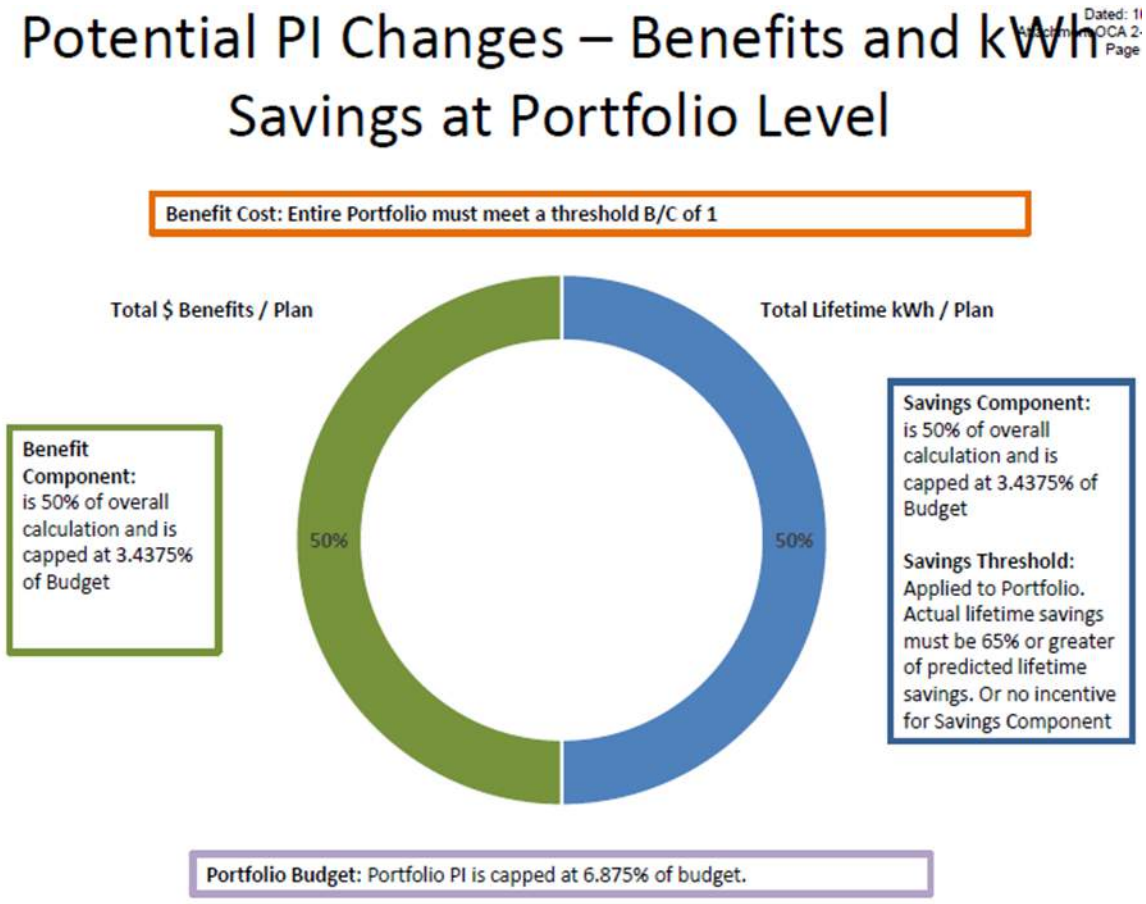
Joint Utilities' Performance Incentive Proposal

In the 2019 Plan Update, the Joint Utilities note that they "have developed a draft proposal for consideration of the Working Group, which can serve as the basis for the remainder of the discussion," and suggest "the Working Group should complete its review by the end of the first quarter of 2019, providing enough time for any recommendations to be

[44] We note that there is a distinction between the total resource benefits we have suggested here (based on the Vermont model) and the more expansive total benefits component the utilities have suggested (based on the Massachusetts model). We are concerned that inclusion of non-resource benefits within the performance incentive equation (as in Massachusetts) may unnecessarily make analysis and acceptance of non-energy impacts more contentious than necessary.

[45] Levin, E. Vermont Energy Investment Corporation (VEIC). VEIC Review of 2018-20 NH Statewide Energy Efficiency Plan: Performance Incentives. (May 2017) Available at: https://www.puc.nh.gov/EESE%20Board/Meetings/2017/071117EERSMtg/VEIC%20Draft%20Plan%20Review%20PI%207-11-17.pdf

considered for the 2020 plan."[46] The joint utilities further specified during discovery that their draft proposal is explained by the diagram shown below.[47]



Q: What is your opinion of this proposed incentive mechanism?

A: I do not support this proposal. First, the two proposed components of the PI are measuring nearly the same outcome. The total value of benefits resulting from each utility's portfolio (whether electric or gas) is mostly a result of the lifetime energy savings. As shown on Plan Attachment E1, page 2 of 5 (Bates 000065), 75% of Eversource's portfolio benefits are

[46] Joint Utilities. 2019 Energy Efficiency Plan Update. (September 2018) Page 46. Available at: https://www.puc.nh.gov/Regulatory/Docketbk/2017/17-136/LETTERS-MEMOS-TARIFFS/17-136_2018-09-14_EVERSOURCE_UPDATED_EE_PLAN.PDF
[47] Response to OCA 2-008. Available at: https://tinyurl.com/17-136-OCA-2-008

derived from electric savings.[48] This is more so with the gas programs; the benefits of Liberty Utilities' gas portfolio are 82% derived from gas savings. Although a utility could increase total dollar benefits without increasing lifetime energy savings, for example through greater focus on peak demand reduction, the proposed PI is too blunt an instrument to promote such an outcome, if desired. This is the second problem I have with the proposal; it provides no incentive for the NH Utilities to achieve other important objectives of the EERS and state energy policy, such as peak demand reduction, equity of service, and the cost-efficiency of the programs (i.e., the cost per unit of energy saved). And while I understand that this is merely an initial suggestion for further discussion, this proposal provides no information about how the PI award would scale with achievement between 65% and 100% (or more) of the target.

Performance Incentive Recommendations

The most likely point of contention relative to the performance incentive working group's recommendations will likely be to whether and to what extent demand reduction becomes a component of the performance incentive. I note that the Commission explicitly directed the working group to examine such a component,[49] and that Rhode Island,[50] Vermont,[51] and

[48] This calculation excludes the "other non-resource benefits" which come from the 10% environmental adder and 10% low income adder, because those are determined on a per-benefit dollar basis, rather than per energy-unit, and therefore will scale directly with any additional benefits from lifetime kWh or therm savings.
[49] Order No. 26,095 at 15. (Stating "The Settlement Agreement continues the current performance incentive mechanism, as proposed by the Utilities in the Three-Year Plan, and provides for a working group to review the performance incentive calculation beginning in 2018 (including consideration of metrics for income eligible participation and peak load reductions) with the goal of implementing any changes to the performance incentive calculation by 2020.") Available at: https://www.puc.nh.gov/Regulatory/Docketbk/2017/17-136/ORDERS/17-136_2018-01-02_ORDER_26095.PDF
[50] National Grid. 2018-20 Energy Efficiency and System Reliability Procurement Plan. (August 2017). Page 63-65. Available at: http://rieermc.wpengine.com/wp-content/uploads/2017/08/2018-2020-3-year-plan-puc-8-30-17.pdf
[51] Order Re: Compensation Set-Aside and Performance Targets for Efficiency Vermont. (November 2017) Page A-1. Available at: https://drive.google.com/file/d/1oFLJ3yOdHyCv-3UmXQsXpf1MBUnTWS9m/view?usp=sharing

Massachusetts[52] include demand reduction as a factor in their performance incentives.[53] Furthermore, the Commission previously directed Liberty Utilities to explore new efforts to reduce peak load.[54]

Q. Why would a focus on peak demand reduction have value for the State of New Hampshire?

A. Transmission costs are an increasingly large portion of customers' bills in New England in recent years.[55] As a result of this, the New England states are in a race to shift allocations of high transmission costs onto one another, *a race that the state of New Hampshire is losing*. For several years now, Rhode Island, Vermont, and Massachusetts have been reducing their peak demand—and therefore the associated "ICAP Tags" through which transmission costs are allocated—through extensive energy efficiency programs. Each of these states reduced peak demand by more than six percent between 2014 and 2017; Maine reduced peak demand by roughly four percent over the same period. In contrast, New Hampshire's reductions total less than two percent.[56] More recently, Connecticut, Massachusetts, and Rhode Island have been piloting active demand reduction through C&I and residential demand response.[57]

[52] Memorandum dated October 19, 2018, Program Administrator Guide to Updates to the September 14, 2019-2021 Draft Plan, available at http://ma-eeac.org/wordpress/wp-content/uploads/Memo-from-PAs-to-EEAC-10-22-18.pdf
[53] We note however, that Massachusetts's potential focus on demand reduction goals explicitly associated with Active Demand Management may be to the detriment of ratepayers when passive demand management (i.e.-energy efficiency) may achieve the same demand reduction goal at lower cost, and suggest that any demand reduction metrics adopted in New Hampshire should remain technology neutral.
[54] New Hampshire Public Utilities Commission. Order No. 26,140 (May 31, 2018) at 9.
[55] New Hampshire Office of Strategic Initiatives. New Hampshire Ten Year Energy Strategy. (April 2018). Page 21. Available at: https://www.nh.gov/osi/energy/programs/documents/2018-10-year-state-energy-strategy.pdf (citing Bob Sanders, "Electric transmission costs scrutinized at NH Energy Summit," (NH Business Review, 4 October 2016), (stating: "New Hampshire Public Utilities Commissioner Bob Scott, who said he examined Eversource rates from 2005 to 2015, said that transporting the power seemed to be the biggest contributor to the rise in costs. According to Scott, distribution costs increased by 78 percent, and transmission costs rose 374 percent.")
[56] Data from NEEP Regional Energy Efficiency Database, available at https://reed.neep.org.
[57] Northeast Energy Efficiency Partnerships. Regional Roundup of Energy Efficiency Policies in the Northeast and Mid-Atlantic. (January 2017) Slide 22. (Identifying several pilot projects in at various efficiency program

According to the pending drafts of their three year energy plans, Massachusetts and Connecticut appear poised to scale these pilots statewide.[58] Further, Massachusetts recently legislatively embraced an energy storage target of 1,000 MWh.[59]

The table below is from ISO New England's 2017 Regional System Plan, which forecasts statewide and system wide net annual and peak electric usage for the next decade, expressed as the compound annual growth rate (CAGR).[60] Maine and New Hampshire are the only states forecast to have meaningful growth in summer peak load. If this forecast proves out, New Hampshire's share of system peak, and therefore system peak costs, will increase by 6%. And while this may seem like a small increase, it translates into tens of millions of dollars of extra expense for New Hampshire's ratepayers.

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administrators including: Eversource (MA); National Grid (MA); Cape Light Compact (MA); Unitil (MA); Eversource (CT); United Illuminating (CT); and National Grid (RI). Available at: https://neep.org/sites/default/files/resources/NEEP%202017%20Regional%20Roundup.pdf

[58] Connecticut 2019-2021 Conservation and Load Management Plan. Pages 80-93, 130-132. Available at: https://app.box.com/s/01sqsrz8ccxd81f6t8iepfjwea24h4tw/file/317462078117; See also, Massachusetts 2019-2021 Energy Efficiency Plan (September 2018) Pages 8, 15, 61-65, and 116-119. Available at: http://ma-eeac.org/wordpress/wp-content/uploads/September-Plan-9-14-18.pdf

[59] Massachusetts 2018 Session Laws. An Act to Advance Clean Energy. Available at: https://malegislature.gov/Laws/SessionLaws/Acts/2018/Chapter227

[60] ISO-New England. 2017 Regional System Plan. (November 2017) Page 40. Available at: https://www.iso-ne.com/static-assets/documents/2017/11/rsp17_final.docx

Area	Energy (GWh)			Summer Peak Load (MW)				
				50/50 Load		90/10 Load		CAGR
	2017	2026	CAGR	2017	2026	2017	2026	
CT	31,336	29,039	−0.8	6,992	6,726	7,666	7,462	-0.3
ME	11,451	11,902	0.4	1,960	2,085	2,099	2,233	0.7
MA	58,336	53,968	−0.9	12,299	12,185	13,338	13,392	0.0
NH	11,793	12,101	0.3	2,460	2,606	2,676	2,854	0.7
RI	8,180	7,257	−1.3	1,870	1,828	2,124	2,128	0.0
VT	5,690	5,412	−0.6	898	877	942	930	−0.1
ISO	126,786	119,680	−0.6	26,482	26,310	28,865	29,021	0.1

One of the primary benefits of demand reduction technologies is their ability to shift transmission costs away from participants (and their respective utilities) by reducing monthly and annual system peak load, therefore shifting ICAP requirements away from the participating distribution utility and, ceteris paribus, towards those distribution utilities who are acting less aggressively to reduce their peak demand. This is true in all months of the year, which is why I recommend that any demand reduction component of the New Hampshire performance incentive have both a winter and summer component.

Q. Are there any figures that might inform demand reduction goals the Commission could direct the utilities to achieve for 2020?

A. The 2018-2020 Plan contains summer and winter kW reduction targets, which I have excerpted below.[61]

[61] Joint Utilities. 2018-20 Statewide Plan. (January 2018) Bates 182-187. Available at: https://puc.nh.gov/Regulatory/Docketbk/2017/17-136/INITIAL%20FILING%20-%20PETITION/17-136_2017-09-01_NHUTILITIES_EE_PLAN.PDF

2018-20 Plan Demand Reduction Targets		
	Summer (kW)	Winter (kW)
2018	9,316	11,989
2019	12,834	15,613
2020	16,774	19,460

In 2015 the New Hampshire Legislature passed and the Governor signed HB 614, which requires the Commission to establish an "electricity peak time reduction goal."[62] Since that time, the Commission has opened two dockets and issued guidance setting forth demand reduction targets.[63] Unfortunately, the Commission has not moved forcefully to set targets, instead setting the 2016 targets at the level of demand reduction already planned by the program administrators, and continuing previously-adopted targets from 2016 until both the EERS and upcoming Grid Modernization proceedings are resolved .[64] It has now been more than 18 months since the Grid Modernization Working Group filed their Report in IR 15-296, with the only Commission guidance on peak demand provided via the direction in Order No. 26,095 that it be considered as a component of the performance incentive for 2020.

As I note above, guidance from the Commission on the value of peak demand reduction prior to the next three year planning process will be vitally important for determining the design of New Hampshire's future energy efficiency programs. More immediately, the potential study to be developed during 2019 would benefit from clarity on the extent to

[62] H.B. 614. Available at: https://legiscan.com/NH/text/HB614/id/1100828
[63] See Generally, New Hampshire Public Utilities Commission Docket No. IR 16-714 and Docket No. IR 17-101.
[64] New Hampshire Public Utilities Commission Secretarial Letter to the Parties in IR 17-101. September 13, 2017. (Stating: "Staff recommended that the Commission continue the existing peak load targets until final recommendations are approved in both the EERS and Grid Modification dockets. The Commission has considered and accepted Staff's recommendation and decided to retain the existing goal of 8,787 kW for summer savings and 9,033 kW for winter savings until ordered otherwise. Staff is directed to file a recommendation for peak load reduction goals following the conclusion of Docket Nos. JR 15-137 and JR 15-296.") Available at: https://www.puc.nh.gov/Regulatory/Docketbk/2017/17-101/LETTERS-MEMOS-TARIFFS/17-101_2017-09-13_SEC_LTR_RETAINING_EXISTING_PEAK_LOAD_REDUCTION_GOAL.PDF

which demand reduction and the potential approaches and measures to achieve demand reduction should be included in the study.

Q: Is there a framework on which you would suggest New Hampshire model its new performance incentive?

A: The Quantifiable Performance Indicator (QPI) framework used for the energy efficiency programs delivered by Efficiency Vermont, the statewide energy efficiency utility in that state, provides a great starting place for a revised New Hampshire performance incentive framework. The QPIs shown below were developed from those used in Vermont,[65,66] but modified to limit the total number of factors included based on the advice of the EESE Board's 2018-20 planning consultant. For the electric programs there are two "threshold" QPIs that must be met for any incentive to be earned and five QPIs that contribute to PI earnings. For the gas programs there are two threshold QPIs and three QPIs that contribute to PI earnings.

Electric Program Minimum Performance Requirements: No performance incentive award if utility fails to achieve	
Title	**Minimum Requirement**
Benefit/Cost Ratio	Total benefits divided by total costs is greater than 1
Equity for Low-Income Customers	Spending on low-income programs is at least 17% of total program spending

[65] Vermont Public Utility Commission. Docket No. EEU-2016-03. Order Re: Compensation Set Aside and Performance Targets for Efficiency Vermont. (November 9, 2017) Appendix A. Available at: https://drive.google.com/file/d/1TioHRzhBUON27te1rPfnvI4Q9mGbCYEc/view?usp=sharing

[66] Vermont Public Utility Commission. Docket No. EEU-2018-03. Order Re: Development and Support Service Budgets, Evaluation Budgets, Other Program Budgets, Forecasts of Expected Savings, and Performance Targets. https://drive.google.com/file/d/14cM_AtyR2WH_K6O3SLPWOMQKCCqeT0Ll/view?usp=sharing

Electric Program Quantifiable Performance Indicators			
QPI #	**Title**	**Performance Indicator**	**Award Weight**
1	Annual Electricity Savings	Annual incremental net MWh savings	30%
2	Lifetime Electricity Savings	Lifetime incremental net MWh savings	9%
3	Summer Peak Demand Savings	Cumulative net summer peak kW demand savings	17%
4	Winter Peak Demand Savings	Cumulative net winter peak kW demand savings	14%
5	Total Resource Benefits	Present worth of lifetime electric, fossil fuel, and water benefits	30%
Total			100%

Gas Program Minimum Performance Requirements: No performance incentive award if utility fails to achieve	
Title	**Minimum Requirement**
Benefit/Cost Ratio	Total benefits divided by total costs is greater than 1
Equity for Low-Income Customers	Spending on low-income programs is at least 17% of total program spending

Gas Program Quantifiable Performance Indicators			
QPI #	**Title**	**Performance Indicator**	**Award Weight**
1	Annual Natural Gas Savings	Annual Incremental Mcf savings	35%
2	Lifetime Natural Gas Savings	Lifetime incremental Mcf Savings	40%
3	Peak Day Natural Gas Savings	Peak Day Incremental Savings (Mcf)	25%
Total			100%

Q. Can you provide an illustrative example of how such a performance incentive would be translate to Eversource Electric's targets and performance incentive dollars?

A. Yes. The table below illustrates how such a methodology would affect Eversource's electric program performance incentive based on its actual 2020 targets and either a single or two-part scale for the various components of the performance incentive.

Below I explain below how I: (1) allocated the 2020 target performance incentive according to Vermont's QPI weighting example; (2) allocated the difference between the target and cap performance incentive to various stretch goals; (3) determined the stretch goals; and (4) determined the scale equation and remaining metrics. As a starting point, I'll note that the 2018-20 Plan already contains 2020 targets for each of the QPIs I've identified above at Bates Page 227R of the 2018-20 Plan, and I have adopted those targets in the table below in the 2020 Target column.[67] The 2020 target performance incentive in each QPI and the 2020 QPI targets themselves directly mirror the figures set forth for 2020 in the 2018-20 Plan, and the performance incentive associated with the stretch goals directly mirrors the incentive cap for 2020 in the 2018-20 Plan.

Allocating the 2020 Target Performance Incentive According to Weighted QPIs

To develop the company awards for the 2020 targets, I started with a calculation of Eversource's target performance incentive award, which according to Bates 229R of the 2018-20 Plan is approximately $2.6 million, equal to 5.5 percent of their total program budget excluding funding for "Smart Start." I then determined what the company's performance incentive award for each of the QPIs would be if it were to earn this incentive allocated according to the QPI award weighting I've set out in the table above, which is largely based on the Vermont performance incentive allocation weights.

[67] Joint Utilities. 2018-20 Statewide Plan. (January 2018) Bates 227R. Available at: https://puc.nh.gov/Regulatory/Docketbk/2017/17-136/INITIAL%20FILING%20-%20PETITION/17-136_2017-09-01_NHUTILITIES_EE_PLAN.PDF

Allocating Difference between Target and Cap Performance Incentive to Stretch Goals

I then determined the performance incentive cap, which according the settlement agreement in 15-137 is 6.875 percent of the program budget, or about $3.2 million.[68] This results in about $640 thousand of additional performance incentive that should be allocated towards performance that exceeds the Company's targets, or "stretch" goals. According to the Company response to CLF 2-11, the utilities have suggested that compliance with Order No. limits their 2019 program years savings to "an energy savings goal of 1 percent of 2014 sales for electric and 0.75 percent 2014 sales for natural gas."[69] As such, I have not allocated any of the "bonus" performance incentive to achievement above target levels for QPIs #1 or #2. The bonus incentive was therefore allocated to the remaining three QPIs in proportion to their relative weighting within the overall QPI framework, to encourage performance above the target.

Determining the Stretch Goals

Because the maximum performance incentive is 25 percent more than the target incentive award, I set the stretch goals for QPIs 3, 4, and 5 as 25 percent above the target achievement levels. This places an emphasis on the utilities' achievement of total resource benefits--a component receiving significant emphasis under the Joint Utilities' proposal and that accommodates the trend towards an increased focus on unregulated fuel savings--and peak demand savings, which is a component that is of interest to the Commission and programs throughout the region.

[68] New Hampshire Public Utilities Commission. Docket No. DE 15-137. Settlement Agreement at 9. Available at: http://www.puc.state.nh.us/Regulatory/Docketbk/2015/15-137/LETTERS-MEMOS-TARIFFS/15-137_2016-04-27_STAFF_PARTIES_SETTLEMENT_AGREEMENT.PDF
[69] Response to CLF 2-011. Available at: https://tinyurl.com/17-136-CLF-2-011

Determining the Incentive Scales

The first step is setting the incentive scales was to set a minimum achievement for earning PI. As a starting assumption, I set the threshold at 75 percent of the target achievement for each QPI, based on simple symmetry with the additional incentive available above the target earnings. Reaching 75 percent of the target would result in earning 75 percent of the target PI for that QPI. Between this level and reaching the target, the PI award scales linearly with achievement. For the three QPIs with stretch goals, the rate at which PI is earned increases, so that reaching the maximum stretch goal of 25 percent above target results for a QPI results in an additional 41 percent PI award. As I noted before, this results from allocating the entire 25 percent additional PI amount to a subset of the QPIs.

The result of these calculations is shown in the table below.

QPI		Threshold	Target	Stretch
Net Incr. Annual Savings (MWh)	Target	81,213	94,749	N/A
	PI Award ($)	$576,442	$768,590	N/A
Net Incr. Lifetime Savings (MWh)	Target	978,803	1,141,937	N/A
	PI Award ($)	$172,933	$230,577	N/A
Summer Peak Reduction (MW)	Target	9,565	12,753	15,941
	PI Award ($)	$326,651	$435,534	$614,031
Winter Peak Reduction (MW)	Target	11,252	15,002	18,753
	PI Award ($)	$269,006	$358,675	$505,673
Total Resource Benefits ($1,000s)	Target	131,512	175,349	219,186
	PI Award ($)	$576,442	$768,590	$1,083,585
	Total PI Award ($)	**$1,921474**	**$2,561,965**	**$3,202,456**

Q. Do you think your proposal is reasonable and could be extended to the other program administrators?

A. Yes, of course, the calculations can proceed in the same fashion. But I want to emphasize that I have provided this testimony for illustrative purposes. Any revised PI framework will need to be fully discussed by the Performance Incentive Working Group or any successor. If the Commission were interested in ruling on the merits of the two proposed frameworks in

December, I would not object and would ask them to rule in favor of my proposal, but I do believe that each could serve as the basis for a continued discussion on the subject for the next few months.

Q. What timeline and procedural posture should the Commission approve to ensure the new performance incentive has been approved by the Commission in time for the utilities to incorporate any changes in their 2020 update?

A. Discussions in the working group have indicated that any significant changes to the performance incentive would result in an overhaul of program designs in subsequent annual plan updates. Given the current means of program approval, which follows a timeline where the joint utilities develop plans each summer for submission and review at the Commission each fall, the utilities would require certainty from the Commission regarding their performance incentives two to three months in advance of their September filing deadline.[70] As such, the Commission should direct the Performance Incentive Working Group to file a report identifying consensus—and if necessary, non-consensus—recommendations relative to the current performance incentive and any proposed revisions no later than April 1, 2019. At that time, the Commission should establish an expedited adjudicatory timeline to resolve any non-consensus issues by July 2019. This maximizes the chances that a new performance incentive framework would be in place to provide the program administrators with guidance and certainty during the lead-up to both the next three year plan and the potential study development process.

[70] Response to Staff 2-034. Available at: https://tinyurl.com/17-136-Staff-2-034

4. FUNDING AND FINANCING WORKING GROUP RECOMMENDATIONS

Q: Do you have any recommendations to make relative to the Funding and Financing Working Group?

A. Yes.

Program Financing

The Joint Utilities' Plan provides financing to support efficiency investments in a variety of ways, and I support their efforts to increase the available pool of funding. On the other hand, some of the available capital pools are still small, and some of the commitments to expand access and develop new approaches to third-party financing remain in the early stages. For example, Unitil is to be commended for offering on-bill financing for the first time, but the available capital pool for residential customers appears capable of funding only ten loans, roughly. I will discuss this in more detail later, but I believe there is an opportunity to generate more funding for financing support in 2019 to help ratepayers capture the benefits of energy efficiency. This opportunity derives from the lower projected SBC charge needed to fund the proposed programs than was estimated in the three-year plan and the EERS Settlement Agreement. Additional funding could also be used to further raise the limit on loan principal. The rate at which residential customers used on-bill financing dropped sharply when the loan limit was reduced. As shown in materials presented to the Financing and Funding Working Group, annual loans dropped from between 90 and 170 per year when loans were available up to $7,500; this dropped to just 30 loans per year when the limit was reduced to $2,000.[71]

[71] Joint Utilities. Energy Efficiency Financing: Background Information for NH PUC Financing and Funding Work Group. Slide 8. (February 2018) Available at: https://www.puc.nh.gov/EESE%20Board/EERS_WG/022118_nh_utilities_energy_efficiency_financing.pdf

Program Funding

The Plan as filed achieves the savings targets set forth in the DE 15-137 settlement, but does so at a lower SBC rate than the estimate included in the settlement and the 2018-2020 Plan. The utilities argue that the Settlement Agreement requires only that they achieve the savings target, and that there is no requirement that they adhere to the estimated SBC rate or associated portfolio budgets.[72] On the other hand, it is clear that the Commission and stakeholders supported a higher level of spending and SBC collection to achieve the targets. Therefore, I believe the Commission should direct the utilities to invest further in unregulated fuel measures, pilot programs, financing (as I described earlier), and other strategies that provide a net economic benefit to ratepayers but that do not translate directly into additional electric or natural gas energy savings. This can be accomplished by keeping the SBC at a level closer to that shown in Order 25,932, approving the EERS Settlement,[73] or Order No. 26,095 which approved the 2018-20 Plan,[74] rather than the rate proposed by the 2019 Plan.

5. LOST BASE REVENUE WORKING GROUP RECOMMENDATIONS

Q: Do you have any recommendations to make relative to the Lost Base Revenues Working Group?

A. Yes. The report of the working group,[75] while making significant strides towards calculating reasonably accurate lost base revenues, misses the mark on estimating lost revenue for demand-billed customers in way that appropriately accounts for the impacts of demand ratchets and measures that reduce total operating hours rather than connected load. OCA's

[72] Response to OCA 2-001(d). Available at: https://tinyurl.com/17-136-OCA-2-001
[73] Order No. 25,932. Adopting EERS Settlement Agreement. Page 52-54. August 2, 2016. Available at: https://www.puc.nh.gov/Regulatory/Orders/2016orders/25932e.pdf
[74] Order No. 26,095. Adopting 2018-20 Plan Settlement Agreement. January 2, 2018. Page 3-4. Available at: https://www.puc.nh.gov/Regulatory/Docketbk/2017/17-136/ORDERS/17-136_2018-01-02_ORDER_26095.PDF
[75] New Hampshire LBR Working Group Final Report. (August 2018) Available at: https://www.puc.nh.gov/EESE%20Board/EERS_WG/2018-08-29-2018wg-report-on-lbr.doc

expert in this area, Paul Chernick of Resource Insights, who participated in the working group and submitted comments on these topics, recommends that additional analysis is needed to better determine an appropriate way to calculate lost demand-billing revenue that accounts for these issues.[76] Given the utilities' concern over OCA's recommended "discount" of the peak reduction values used for LBR calculation,[77] the EM&V Working Group may be best positioned to oversee a study to reconcile the divergent opinions and determine to what degree, if any, the currently proposed methodology may need to be revised. While there is a financial cost to conducting such a study, this cost will likely be far less than the potential reduction in lost revenue collections if the OCA expert's concerns are proven to be valid. For example, Eversource's lost revenue adjustment for 2019 is forecast to be approximately $4.7 million, as compared to a Program Budget of $33 million.[78,79] Lost revenue amounts increase and accumulate also between rate cases, so correcting any inaccuracies should be done in a timely fashion. Therefore, the Commission should direct the EM&V Working Group to solicit, contract with, and manage an independent consultant for an analysis of actual lost revenues for a statistically significant sample of demand-billed customers and to compare the results with projected lost revenues under the current methodology. If the resulting lost revenues vary from those projected under the current methodology, then the parties can suggest an alternative approach in the 2020 update based on those results.

[76] New Hampshire Office of the Consumer Advocate. Comments on LBR Working Group Draft Report. (August 2018) Available at: https://drive.google.com/file/d/1fjjPqsFRcY7N3sr_Wx95KnOvb9MUzO1I/view?usp=sharing
[77] Joint Utilities. Comments on LBR Working Group Draft Report and Rebuttal to OCA Comments. (August 2018) Available at: https://drive.google.com/file/d/1ZS-P-7eoR2MOI5CAQYx6ueZlB2Jdv5SD/view?usp=sharing
[78] Joint Utilities. 2019 Energy Efficiency Program Plan Update. Bates 082. Available at: https://www.puc.nh.gov/Regulatory/Docketbk/2017/17-136/LETTERS-MEMOS-TARIFFS/17-136_2018-09-14_EVERSOURCE_UPDATED_EE_PLAN.PDF
[79] Ibid. Bates 058.

6. EM&V WORKING GROUP RECOMMENDATIONS

Q. Do you have any recommendations to make relative to the EM&V Working Group?

A. Yes. One of the most important tasks the EM&V Working group will face in 2019 will be the development of a potential study. As noted in the strategic evaluation plan, the potential study will be utilized to determine the cost-effective energy efficiency potential in New Hampshire. I believe that the process for developing this potential study should be as inclusive as possible, providing stakeholders with an opportunity to provide input during the early stages of development, and then again once the potential study is available in draft form. An analogy can be drawn to the manner in which the EM&V Working Group sought stakeholder input on the Non Energy Impact (NEI) portion of Home Energy Assistance Program Process Evaluation and the Cross Cutting NEI Evaluation.[80] Providing stakeholders with the opportunity to better understand and perhaps comment on the assumptions underpinning the potential study would likely enhance stakeholder acceptance of the opportunities and barriers relating to achieving cost-effective energy and demand savings in New Hampshire.

The Commission should direct the EM&V Working Group to explicitly outline a process for facilitating input on—and stakeholder understanding of—the potential study in the 2019

[80] Benefit Cost Working Group September 26, 2018 meeting agenda and minutes from the previous meeting. Available at: https://www.puc.nh.gov/EESE%20Board/EERS_WG/20180926-b-c-wg-agenda.pdf The Home Energy Assistance program evaluation contractor developed a summary of their low-income NEI evaluation plan and circulated it to the working group prior to calling-in to the July 11, 2018 meeting of the benefit-cost working group to gather input on their planned approach to measuring non-energy impacts and ask questions regarding which non-energy impacts the stakeholders in the group thought would be of value to study in New Hampshire. They then summarized the input of the working group stakeholders in a follow-up memo. Similarly, the cross-cutting non-energy impact evaluation study contractor attended the September 26, 2018 meeting of the benefit cost working group to gather input on their proposed approach to quantifying non-energy impacts across the programs.

update of its' Strategic Evaluation Plan,[81] beyond the existing communication channel provided by the EESE Board Representative on the EM&V Working group.

Q. Do you have any specific recommendations or concerns regarding the potential study?

A: While it is premature to discuss the study in detail, I would like to note a few of the key issues that often arise in potential studies conducted under similar circumstances. First, it is important that the objectives of the study are clearly stated during the planning stage. To provide relevant guidance to policymakers, regulators, and program administrators, these groups must clearly specify the questions they want answered. I would suggest that simply stating that the question to be answered is "What is the energy efficiency potential in New Hampshire?" will be insufficient to guide the work. Some more focused questions to be answered could include the following:

- Which market segments provide the most efficiency potential?
- In which end-uses is the gap between available potential and recent and planned program achievement the largest?
- How sensitive is the available potential to assumptions regarding avoided costs, discount rates, sales forecasts, or other variables?

The answers to these questions will inform the selection of assumptions, inputs, and methods. For example, if the potential study is to be used primarily to set savings targets for the next 3 to 5 years, a 10 or 20-year time horizon for the analysis is unnecessary.

Q. Do you have any other recommendations to make relative to the EM&V Working Group?

[81] New Hampshire Evaluation, Measurement, and Verification Working Group. 2018 Strategic Evaluation Plan. Available at: https://www.puc.nh.gov/EESE%20Board/EERS_WG/2018-08-20-strategic-evaluation-plan-august.pdf

A: Yes. In my testimony up to this point, I have mentioned a few topics that I believe require further discussion and analysis and opined that the EM&V Working Group could be a useful venue for these. In summary, they are:

- Beginning a process to apply the NSPM to the development of a refined cost-effectiveness test for NH efficiency programs
- Setting guidelines for how bill and rate impact analysis are conducted and presented
- Resolving remaining issues related to the calculation of lost base revenue, particularly related to the lost revenue from demand-billed customers

Q: Do you have any final recommendations relative to the working group processes as a whole?

A. Yes. The 2019 Plan Update suggests that "[m]ovingforward and in 2019, the existing DE 17-136 Quarterly Meetings should serve as a venue to discuss cross-cutting topics."[82] While I am sympathetic with the concern expressed in the Plan regarding the occasional duplicative nature of the discussions in the various working groups, the cure for this concern is not to fold the resolution of unfinished working group objectives into the EERS Quarterly meetings. These meetings largely focus on a review of prior program performance, rather than substantive forward-looking issues. Furthermore, as indicated by their name, they only occur four times per year, and the hours available are not likely to be sufficient to resolve all of the outstanding issues. A more appropriate venue for discussion of such issues would be the EERS Committee of the Energy Efficiency and Sustainable Energy (EESE) Board. That Committee could meet monthly with its agenda be set by an executive committee composed

[82] Joint Utilities. 2019 Energy Efficiency Program Plan Update. Page 45-46. Available at: https://www.puc.nh.gov/Regulatory/Docketbk/2017/17-136/LETTERS-MEMOS-TARIFFS/17-136_2018-09-14_EVERSOURCE_UPDATED_EE_PLAN.PDF

of one representative from each of the state agencies represented on the EESE Board. This arrangement would more closely mirror the processes established in Connecticut under the Energy Efficiency Board, Massachusetts under the Energy Efficiency Advisory Council, and Rhode Island under their Energy Efficiency and Resource Management Council.[83]

The joint utilities have suggested that "[t]he EESE Board or EERS Committee should not model monthly meetings on these [neighboring] boards, because the role and objectives are not the same," and because "the legislative energy efficiency and climate mandates, goals, and policies of [Massachusetts] and [Connecticut], which give direction to the stakeholder board, are different than those that currently exist in New Hampshire."[84] This argument fails to acknowledge that New Hampshire has policies and mandates that are very similar to those neighboring jurisdictions, including:

1. A regulatory mandate to pursue all cost-effective energy efficiency adopted in Order No. 25,932;
2. A legislative mandate embodied within RSA 378:37, the statute which sets forth New Hampshire's energy policy, which was amended in 2014 to include an explicit directive to maximize the use of cost-effective energy efficiency and other demand-side resources;[85]
3. A State Energy Plan that describes energy efficiency as "the cheapest and cleanest resource," and suggests that "New Hampshire should prioritize capturing cost-effective

[83] *See Generally,* U.S. Department of Energy State and Local Energy Efficiency Action Network. Energy Efficiency Collaboratives: Driving Ratepayer Funded Efficiency through Regulatory Policies Working Group. (September 2015) Available at: https://www4.eere.energy.gov/seeaction/system/files/documents/EECollaboratives-0925final.pdf
[84] Response to OCA 2-007. Available at: https://tinyurl.com/17-136-OCA-2-007
[85] N.H. Rev. Stat. Ann. § 378:37 (Identifying the state energy policy of New Hampshire as "meet[ing] the energy needs of the citizens and businesses of the state at the lowest reasonable cost…[and] maximize[ing] the use of cost effective energy efficiency and other demand side resources.")

energy efficiency in all sectors, including buildings, manufacturing, and transportation;"[86] and

4. A stakeholder board established under RSA 125-O:5 tasked with "promot[ing] and coordinat[ing] energy efficiency, demand response, and sustainable energy programs in the state."[87]

I also wish to note that while the EM&V Working Group may be an appropriate venue to discuss several of the unresolved issues I have mentioned in this testimony, final decisions on any substantive policy issues related to the above-described recommendations should be brought to the full EERS Committee for input and approved by the Commission. The EESE Board is represented on the EM&V Working Group by only one individual, and it is unreasonable to expect this individual to represent the potentially divergent interests of the various stakeholders on the EESE Board.

7. PROGRAM DESIGN RECOMMENDATIONS

Q: Do you have any programmatic recommendations you wish to make which are unrelated to the working group processes of the past few months?

A. Yes, there are several areas where the 2019 Plan and on-going programs could be improved or expanded in important ways, including greater embrace of controllable heat pump water heaters, strategic energy management, LED street lighting conversion, and re-examination of Customer Engagement Platform.

[86] New Hampshire Office of Strategic Initiatives. New Hampshire Ten Year Energy Strategy. (April 2018). Page 14-15. Available at: https://www.nh.gov/osi/energy/programs/documents/2018-10-year-state-energy-strategy.pdf
[87] N.H. Rev. Stat. Ann. § 125-0:5-a. Available at: http://www.gencourt.state.nh.us/rsa/html/X/125-O/125-O-5-a.htm

Controllable Heat Pump Water Heaters

One potential enhancement in residential programs relates to my previous comments regarding the importance of peak demand reduction. New storage hot water heaters, whether heat pump or electric resistance, are an opportunity to build a controllable demand response resource. Because heating the water in the storage tank does not need to occur at the same time as usage, it can often be shifted away from peak periods. In response to a data request on the subject, the utilities have expressed openness to providing an additional incentive to controllable water heaters, pending further examination of their benefits and cost-effectiveness.[88] The Commission should direct the utilities analyze the potential benefits of controllable domestic hot water heating and, if cost-effective, develop a strategy to use this resource. This could provide the utilities with an additional strategy for meeting demand reduction targets incorporated into their performance incentive.

Strategic Energy Management Pilot

For commercial, industrial, and municipal customers, there are other opportunities. Strategic Energy Management (SEM) and the related ISO 50001 Energy Management Standard are being embracing by leading efficiency states as approaches to realizing ongoing reductions in energy consumption from large C&I customers. The EESE Board has recommended that the utilities pursue SEM and capture the substantial cost-effective savings believed to exist, but the Plan does not include any mention of it. I also note that the utilities' counterpart operating companies in Massachusetts and Connecticut have committed to pursuing this strategy as part of their next three-year plans.[89] The Commission should direct

[88] Response to OCA 2-024. Available at: https://tinyurl.com/17-136-OCA-2-024
[89] Connecticut 2019-2021 Conservation and Load Management Plan. Pages 126-129. Available at: https://app.box.com/s/01sqsrz8ccxd81f6t8iepfjwea24h4tw/file/317462078117; See also, Massachusetts 2019-

the utilities to pilot Strategic Energy Management in New Hampshire as well, even if only with one large customer. Funding for the pilot could come from maintaining the SBC at a level closer to the level previously estimated in Order 25,932 which approved the EERS,[90] or Order No. 26,095 which approved the 2018-20 Plan,[91] rather than the rate proposed by the 2019 Plan.

LED Street Lighting Conversion

Municipal customers in New Hampshire are sitting on another relatively untapped reservoir of savings in the form of LED street lighting retrofits. The utilities' responses to discovery requests made by OCA regarding the cost of fixtures, applicable tariffs, ownership models, and remaining street lighting equipment depreciation on their books make it clear that this is a complicated issue. Many factors contribute to the ability of towns to reduce their street lighting energy consumption and ongoing maintenance costs and utility bills, and there is little consistency between the utilities. A detailed review of all of these is beyond the scope of my testimony today, but I do have some recommendations that I believe will help advance the rate of street lighting conversion for the benefit of New Hampshire towns and their residents. First, advanced lighting controls represent an opportunity to achieve greater savings from new street lighting fixtures.[92] In Massachusetts, Eversource has been working

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2021 Energy Efficiency Plan (September 2018) Pages 89-90. Available at: http://ma-eeac.org/wordpress/wp-content/uploads/September-Plan-9-14-18.pdf

[90] Order No. 25,932. Adopting EERS Settlement Agreement. Page 52-54. August 2, 2016. Available at: https://www.puc.nh.gov/Regulatory/Orders/2016orders/25932e.pdf

[91] Order No. 26,095. Adopting 2018-20 Plan Settlement Agreement. January 2, 2018. Page 3-4. Available at: https://www.puc.nh.gov/Regulatory/Docketbk/2017/17-136/ORDERS/17-136_2018-01-02_ORDER_26095.PDF

[92] Timothy Clougherty. City of Manchester Department of Public Works Presentation to the Energy Efficiency and Sustainable Energy Board. Slides 15-25. (Describing the various benefits of advanced lighting controls) Available at:

with the City of Cambridge for almost a year to reach agreement on a standardized tariff offering to incorporate advanced lighting controls and associated un-metered usage determinations. Specifically, Eversource recently presented testimony[93] and a tariff[94] for approval by the Department of Public Utilities based on these negotiations. This tariff would allow municipalities to realize savings from dimming strategies that reduce consumption compared to the assumed usage—and therefore, energy charges—based on daylight patterns. Further, Eversource has indicated a willingness to support such a tariff offering in New Hampshire.[95] Therefore, the Commission should direct the utilities to adopt a similar tariff provision to accommodate advanced lighting controls. Second, the pilot program established in DE 13-248 allowing the city of Manchester to assume responsibility for operation and maintenance (O&M) costs for their LED streetlights should be considered a success, and therefore this model should be made available to other interested municipalities.[96]

Third, and most importantly, the Commission should open an investigation into the street lighting tariffs offered by Unitil and Liberty, which vary drastically from that provided by Eversource. More disconcerting is the apparently inconsistent treatment of system costs in various luminaire types. For example, under Unitil's street lighting tariff, the charge for a 3,000 lumen LED cobra head fixture is $13.03 per month, while the charge for comparable

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https://www.puc.nh.gov/EESE%20Board/Meetings/2018/072018mtg/072018-ppt-manchester-led-streetlight-conversion.ppt

[93] Testimony of Richard D. Chin and Kevin J. Morley. Massachusetts Department of Public Utilities Docket No. 17-05. October 2, 2018. Available at: https://drive.google.com/file/d/1oMcxVyI2RUGHWA3etVvaOLTSOGL9JljR/view

[94] NSTAR Advanced Controls Tariff. Massachusetts Department of Public Utilities Docket No. 17-05. Available at: https://drive.google.com/file/d/1u0Wfe8D2r4EsF190G_T56nFeBvPcMFP-/view

[95] Response to OCA 2-020. Available at: https://tinyurl.com/17-136-OCA-2-020

[96] New Hampshire Public Utilities Commission. Order No. 25,701. (August 2014) Page 9. Available at: http://www.puc.state.nh.us/regulatory/Docketbk/2013/13-248/ORDERS/13-248%202014-08-04%20ORDER%20NO%2025-701.PDF

4,000 lumen sodium vapor street light is $13.44 per month. This seems reasonable until one learns that the customer must pay all of the up-front equipment and installation costs AND on-going maintenance costs for the LED fixture, where all of these costs included in the monthly tariff for the inefficient sodium vapor fixture. This is clearly stated in Unitil's response to OCA 2-22: "[T]he luminaire charge for sodium vapor light fixtures includes the cost of the fixture, cost of installation, cost of maintenance and cost of the distribution system (demand costs and customer costs) to provide electric delivery service to the fixture. The luminaire charge for LED light fixtures only include the cost of the distribution system to provide electric delivery service (demand costs and customer costs) since the customer pays the initial cost of the light, the cost of installation, and the cost of ongoing maintenance."[97] This disparity between system costs assigned to luminaires on the basis of their technology type alone borders on discriminatory and deserves investigation by the Commission. Furthermore, it is unclear why the monthly cost for an LED fixture that will consume between 10 and 20 percent less energy and for which the utility incurs no maintenance costs is only 3 percent less expensive on a monthly basis than the inferior light-quality sodium vapor fixture.

It is also is also worth noting that when asked in discovery which municipalities they planned to convert to LED street lighting during 2018, Unitil acknowledged that it had no plans to convert any municipalities, Liberty suggested it planned to convert one, and Eversource identified dozens of communities it has already converted or plans to convert.[98] Moreover, according to the response to OCA 2-19, Eversource has converted 75 percent of its municipalities to LED, Liberty Utilities have converted only 3 percent of its 6,631

[97] Response to OCA 2-022. Available at: https://tinyurl.com/17-136-OCA-2-022
[98] Response to OCA 2-18 and 2-019. Available at: https://tinyurl.com/17-136-OCA-2-018-019

luminaires to LED, and Unitil appears to have converted not a single one of its 7,200 luminaires to LED.[99] These vast disparities suggest the Commission needs to open an investigation into the street lighting tariff offering of New Hampshire's electric distribution utilities.

Customer Engagement Platform

Next, I wish to draw attention to the Customer Engagement Platform (CEP). The CEP is designed in part to facilitate Eversource's customers interaction with their energy consumption and energy efficiency opportunities. The CEP was a substantial investment of capital funds and requires ongoing maintenance and software licensing costs. Currently, the O&M costs are paid for from the energy efficiency program budgets. Despite efforts to promote the platform, the number of customers using the platform seems low. Total annual visits to the site are of a similar magnitude as the number of planned participants in the Home Energy Assistance, Home Performance with Energy Star, and Energy Star Homes programs, although the hurdle of "participating" in the CEP is lower, presumably. The Commission should determine whether or not it is still appropriate for the energy efficiency programs to fund this initiative, or whether it would be better placed in Eversource's base rates. At the very least, the Commission should direct Eversource to investigate integrating Green Button "Connect My Data" functionality into the platform. Eversource has Green Button "Download My Data" functionality on its website,[100] but "Connect My Data" would allow customers to send their data directly to a third party who might offer services such as energy efficiency, demand response, or a time of use rate offering based on the customer's usage profile. Time-

[99] Response to OCA 2-18 and 2-019, and Unitil Supplemental Response. Available at: https://tinyurl.com/17-136-OCA-2-018-019 and https://tinyurl.com/Unitil-Street-Light-Inventory
[100] Response OCA 3-003. Available at: https://tinyurl.com/17-136-OCA-3-003

differentiated rates deserve special mention here, as they are widely touted as an inexpensive strategy to lower system peak demand and its associated costs, but have not been widely implemented or adopted by consumers. Allowing customers to work with a retail energy provider to select a time-differentiated rate based on their existing consumption patterns might result in a larger percentage of New Hampshire ratepayers controlling their electric bill to their own and the system's benefit. Based on a relatively short review of the data on retail energy providers on the Commission website, I do not think that there are any such rates available to residential customers.

Energy Efficiency NWA Pilots

Last, I wish to point to the testimony of OCA Witness Chris Neme, which will also be filed today. In his testimony, Mr. Neme articulates the case for initiating pilot programs that assess energy efficiency as a non-wires alternative (NWA) to meeting distribution system needs. I support this approach, because efficiency has successfully been used in other jurisdictions as an NWA, and this has reduced ratepayer costs needed to accommodate load growth and the need for distribution system upgrades.

8. CONCLUSION AND SUMMARY OF RECOMMENDATIONS

Q. Please provide an overview of the recommendations you make based on your review of the Draft 2019 Plan Update and your understanding of the working groups.

A. Below I review my recommendations for the Commission, which I detailed the basis for in my testimony above.

Cost Effectiveness Screening and Updated Avoided Energy Supply Cost Values

1. The Commission should accept the values included in the 2018 Avoided Energy Supply Cost Study ("AESC 2018" or "Study"), but as a condition of approval require the utilities to furnish transmission and distribution system data for the study's authors next time it is requested. I have no firm position at this time on the 2019 Plan's adoption of the value of reliability set forth in AESC 2018.
2. The Commission should accept the environmental externality benefits for fossil fuel savings that is included in the 2019 Plan.
3. The Commission should accept the additional ten percent low-income benefit adder included in the 2019 Plan and clarify that it expects the adoption of such an adder to lead the utilities to serve more low-income participants than originally planned in the 2018-20 Plan, rather than fewer.
4. The Commission should direct the Benefit Cost Working Group, any successor, or the EM&V Working Group to study the regional trend toward energy efficiency programs claiming savings for fuel switching and make recommendations relative to that trend no later than June 2019. If a consultant is managed by the EM&V Working Group, the Commission should require that the consultant gather input from stakeholders outside the EM&V Working group, including the benefit cost-working group or any successor.
5. The Commission should direct the EM&V Working Group to solicit and oversee a consultant who will develop a report detailing application of the National Standards Practice Manual ("NSPM")'s Resource Value Framework ("RVF") in New Hampshire, and make recommendations relative to the RVF no later than June 2019. The Commission should require that any consultant gather input from stakeholders outside the EM&V Working group, including the benefit-cost working group or any successor.

6. The Commission should direct the EM&V Working Group to solicit and oversee a consultant who will provide a bill impact analysis for New Hampshire's 2019 ratepayer funded energy efficiency programs, including an analysis of bill impacts for participants, bill impacts for non-participants, and bill impacts for the average customer.

Performance Incentive

1. The Commission should provide direction regarding the new performance incentive proposal by the Joint Utilities and the alternative approach I described earlier in my testimony, and direct the performance incentive working group or any successor to file recommendations by April 1, 2019.
2. If there are any non-consensus issues, the Commission should establish an expedited procedural schedule to resolve those issues that begins in early April 2019 and provides for a hearing by July 2019.

Funding and Finance

1. The Commission should direct the utilities to collect program funds at the rate of the previously-estimated SBC and to use these funds for a variety of program enhancements that do not directly result in electric or natural gas energy savings, but do provide a net benefit to New Hampshire's ratepayers. This would include additional capital for financing, a greater focus on peak demand reduction and unregulated fuels, and expanded pilot financing initiatives.

Lost Base Revenue Methodology

1. The Commission should direct the EM&V Working Group to solicit, contract with, and manage an independent consultant for a billing analysis of actual lost revenues for a

statistically significant sample of New Hampshire ratepayers so that it can be compared with the results with projected lost revenues using the current methodology and the revised methodology as proposed by OCA's expert.

EM&V Working Group Recommendations

1. The Commission should direct the EM&V Working Group to explicitly outline a process for facilitating input on—and stakeholder understanding of—the potential study in the 2019 update of its' Strategic Evaluation Plan, beyond the existing communication channel provided by the EESE Board Representative on the EM&V Working group.
2. As suggested above, the EM&V Working Group could be a useful venue for discussion of a number of additional topics, including 1) a process to apply the NSPM to the development of a refined cost-effectiveness test for NH efficiency programs, 2) setting guidelines for how bill and rate impact analysis are conducted and presented, 3) resolving remaining issues related to the calculation of lost base revenue, particularly related to the lost revenue from demand-billed customers.

Program-based Recommendations

1. The Commission should direct the utilities to analyze the potential benefits of controllable domestic hot water heating and, if cost-effective, develop a strategy to use this resource.
2. The Commission should direct the utilities to pilot Strategic Energy Management in New Hampshire, even if only with one large customer.
3. The Commission should open an investigation into the street lighting tariffs offered by Unitil and Liberty, require the utilities to adopt tariff language permitting use of advances

lighting controls, and declare Manchester's O&M pilot a success and direct Eversource to offer it to all municipal customers.

4. The Commission should take a hard look at Eversource's Customer Engagement Platform and at the very least direct Eversource to investigate integrating Green Button "Connect My Data" functionality into the platform.

5. The Commission should direct the utilities to conduct a pilot assessment of energy efficiency as a non-wires alternative to distribution system investments, as further discussed in the testimony of OCA Witness Chris Neme.

Q: Does this conclude your testimony?

A: Yes, it does.