Optimal ENERGY Integrated Energy Resources

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I. EXECUTIVE SUMMARY

A. Discussion and Context

As the Commission has recognized in opening this docket, New Hampshire faces a significant opportunity to increase its investment in the most cost-effective energy resource, energy efficiency. Efficiency represents both an opportunity and a much-needed resource, and one that is already recognized as a key part of utility resource portfolios. NH RSA 378:37 [New Hampshire Energy Policy] specifically states:

> "It shall be the energy policy of this state to meet the energy needs of the citizens and businesses of the state at the lowest reasonable cost while providing for the reliability and diversity of energy sources; **to maximize the use of cost effective energy efficiency and other demand side resources**; and to protect the safety and health of the citizens, the physical environment of the state, and the future supplies of resources, with consideration of the financial stability of the state's utilities." (Emphasis added)

As the lowest-cost resource and one that allows New Hampshire to control its high energy costs while diversifying an increasingly imbalanced fuel portfolio, energy efficiency is the most sensible means to fulfill its statutory energy policies and purposes.

Expanding energy efficiency in New Hampshire can mean lower customer bills, improved consumer choice, enhanced system reliability, and increased economic activity statewide, consistent with New Hampshire's Electric Utility Restructuring law, RSA 374-F:3 (X):

> "Restructuring should be designed to reduce market barriers to investments in energy efficiency and provide incentives for appropriate demand-side management and not reduce cost-effective customer conservation. Utility sponsored energy efficiency programs should target cost-effective opportunities that may otherwise be lost due to market barriers."

Restructuring alone has not reduced these market barriers sufficiently over the past fifteen years; New Hampshire has effective programs but the time has come to achieve all cost-effective efficiency through a more strategic and targeted approach. An Energy Efficiency Resource Standard is one such approach that has proven to be successful in many states. An Energy Efficiency Resource Standard (EERS) has been implemented in half of the states across the country, including the leading efficiency states, as a policy mechanism for achieving cost-effective energy savings. Energy efficiency resources are particularly critical given the current regional landscape of retiring generation, decreased supply diversity, and the need to meet

significant environmental goals. An EERS puts the infrastructure and incentives in place for utilities and program administrators to invest in efficiency as a resource to meet long term energy needs.

This document identifies several topic areas related to the design of a successful EERS for New Hampshire. The discussion draws on experience and best practices in other jurisdictions and offers recommendations related to target setting, program administration, funding, cost recovery, performance incentives, and Evaluation, Monitoring and Verification (EM&V).

In 2013, states without an EERS achieved on average only one quarter of the energy savings of states with an EERS.[1] Currently, New Hampshire is the only state in New England without an EERS, even though much of the customer load in the state is served by utilities that are achieving substantial efficiency savings in neighboring states, or whose parent utilities are doing so. For example, in 2014 Eversource Energy achieved savings of 2.9% of its electric sales to meet the EERS target in Massachusetts, while only saving approximately 0.7% in New Hampshire.[2] As ranked in ACEEE's 2015 State Energy Efficiency Scorecard, five out of the top ten states for achievements in energy efficiency are in our region, while New Hampshire is ranked only 20th.[3]

For states such as New Hampshire, funding constraints negatively affect the process of setting savings goals. In contrast, all of the other New England states have passed legislation that requires utilities to achieve all cost-effective energy savings with no arbitrary funding limits.[4] This recognizes that energy efficiency continues to be the cheapest option for meeting energy demands. Failing to capture all cost-effective efficiency ultimately results in greater ratepayer costs than necessary, in two key ways. First, efficiency is cheaper than generating energy supply. Second, reports from the Independent System Operator of New England (ISO-NE) show that recent trends could disadvantage New Hampshire against its neighboring states in terms of mandatory, socialized costs. Peak demand, which dictates the need for expansions in transmission and distribution infrastructure, is growing faster than regular demand.[5] Because other states are investing in efficiency and distributed generation, their share of the ISO-NE peak load is decreasing. If New Hampshire does not follow suit, its share of load will increase and therefore its ratepayers will be responsible for a higher share of regional transmission and capacity costs.

With respect to concerns about the magnitude of funding for energy efficiency and resulting rate impacts, it is important to keep in mind that cost-effective efficiency reduces total ratepayer

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[1] ACEEE, "State Energy Efficiency Resource Standards (EERS)." April 2015. http://aceee.org/sites/default/files/eers-04072015.pdf.

[2] Eversource Massachusetts savings data from http://masssavedata.com/Public/SalesAndSavings; Eversource New Hampshire savings data from http://www.puc.nh.gov/Electric/NH%20EnergyEfficiencyPrograms/12-262/2014/NH%20CORE%20Energy%20Efficiency%20Programs%204th%20Quarter%20Report%202014.pdf and EIA Form 861 http://www.eia.gov/electricity/data/eia861/.

[3] ACEEE, "State Energy Efficiency Scorecard. 2015. http://aceee.org/state-policy/scorecard.

[4] Gilleo, Annie, ACEEE, "Picking All the Fruit: All Cost-Effective Energy Efficiency Mandates." 2014 ACEEE Summer Study on Energy Efficiency in Buildings. http://aceee.org/files/proceedings/2014/data/papers/8-377.pdf.

[5] http://www.iso-ne.com/about/what-we-do/three-roles/operating-grid

spending on energy. This is what is meant by "cost-effective energy efficiency;" it results in net economic savings to society. Public funding of cost-effective efficiency programs results in direct ratepayer monetary savings. Few areas of public policy can make that claim.

The time for an update to New Hampshire's approach to energy efficiency has come. The Systems Benefits Charge for energy efficiency has not changed in nearly two decades, nor has New Hampshire realized the full market transformation that Restructuring intended. Inflation alone over that time would suggest a need to increase efficiency investment in real terms, while supply and demand dynamics suggest that New Hampshire customers could benefit significantly from increasing their use of efficiency as an energy source. In addition, New Hampshire should pursue greater efficiency in order to mitigate its share of the regional system costs. For example, New Hampshire currently represents about 9% of the regional system load. As other states pursue energy efficiency to a greater degree than New Hampshire, this percentage is likely to increase, which means that New Hampshire will need to pay a greater share of regional transmission reliability project costs in the future. The Commission and the State should take this opportunity to increase investment in this valuable and least cost energy resource.

B. Summary of Findings and Recommendations

- The EERS should include explicit quantitative short-term goals, preferably expressed as a cumulative goal over a three-year term. Goals should be expressed in terms of measured and evaluated reductions in energy sales and peak demand, rather than spending on programs, customer participation, or other non-energy metrics. Longer-term goals may also be appropriate, but the changing landscape of energy and efficiency suggests that these may best be expressed in qualitative terms, such as "all cost-effective energy efficiency."
- Cumulative electric and gas energy savings target of 3.1% and 2.25% of sales for the 2017-2019 period, respectively, are reasonable and achievable cost-effectively.
- While the gas and electric utilities in New Hampshire are capable of delivering high-quality efficiency programs to meet these targets, there may be benefits from transitioning some or all program delivery to a state-wide program administrator over time.
- The efforts to meet the requirements of an EERS, regardless of who implements them, should be overseen and guided by an advisory body with sufficient resources to ensure success.
- The existing funding for efficiency in New Hampshire is below the amount that is economically efficient and that is necessary to achieve the recommended targets. Rate impacts will occur as a result of efficiency program implementation, regardless of the source of funding for these

programs, but cost-effective efficiency programs result in lower total bills for ratepayers, even if unit energy rates increase.

- Utilities that implement efficiency must have three areas of cost addressed in order to be successful: recovery of program costs; a mechanism to address lost fixed cost recovery resulting from lower sales from efficiency; and incentives that make efficiency investments as attractive as supply-side investments. New Hampshire has two of these in place (cost recovery and incentives), and should implement the third to ensure that utilities are full partners in efforts to achieve all cost effective efficiency.
- The results of energy efficiency programs must be measured in a way that gives all stakeholders confidence that reported energy savings are accurate and reliable.

II. SETTING EFFICIENCY TARGETS

A. General Principles

The most visible and tangible element of an EERS is some expression of desired outcomes framed as energy reduction goals or targets over a specified time frame. These targets can be expressed as energy savings in kilowatt-hours or therms, peak demand savings in kilowatts, percentages of annual retail energy sales or peak load, or reductions in per-capita energy consumption. They may be expressed on an annual basis or as a cumulative multi-year target.

The first consideration in setting targets is the timeframe that they will cover. Limiting goals to the near-term, between two and four years, reduces uncertainty in market, technology, and economic conditions that affect the costs and benefits of efficiency measures. For example, LED lighting technology has progressed rapidly in the past few years; this is likely to continue. Because lighting is usually an important part of efficiency programs, setting goals more than a few years into the future requires too many guesses about further progress in this technology.

Keeping targets to a shorter timeframe allows for greater flexibility and consideration of emerging and changing technology, but longer-term goals (e.g., five to ten years) are valuable both as an aspirational metric and to express a commitment to efficiency in the future. However, longer term goals should not be used as a ceiling or an arbitrary maximum if and when greater investments in efficiency are justified. This commitment is particularly important where a strong market for efficiency services and products has not yet developed, as it provides the confidence that businesses need to enter these markets and invest for future growth.

One strategy to address the uncertainty in setting longer-term goals is to express those goals qualitatively rather than quantitatively. States that lead the nation in efficiency have expressed their long-term goals as "all cost-effective" efficiency; this would also be in keeping with New Hampshire's State Energy Strategy, RSA 378:37, and the Commission's objective of ensuring just and reasonable rates. This longer-term goal can then be translated into more quantitative and concrete near-term goals based on current conditions. For example, carbon regulation in the form of the Clean Power Plan will almost certainly change the cost-effectiveness calculation for

efficiency measures; technologies and services that were not cost-effective may become so in the future as the value associated with avoiding fossil-fuel generation increases. Therefore, a balance is achieved by setting quantitative goals for the near-term, while setting the expectation for all cost-effective efficiency in the longer term based on a periodic revisiting of what is cost-effective based on conditions at that time.

Another dimension to consider is whether goals over a multi-year period are individual annual goals or cumulative goals over that entire multi-year period. Cumulative goals have the benefit of promoting a focus on consistent program delivery throughout the period. Evidence from many jurisdictions has shown a typical pattern where a large fraction of annual savings are generated from projects completed in the fourth quarter of the program year, resulting in a "hockey-stick" graph of achievement over time.[6] Repeating this approach for several years in a row has several drawbacks: fatigue on the part of program administrators, confusion in the marketplace resulting from repeated "limited-time offers" or "sales" on efficiency, and drawing resources away from longer-term market transformation efforts in favor of "quick-hit" savings strategies. A New Hampshire EERS should include cumulative goals rather than annual goals, broken up into three-year periods, as detailed below.

By saving 3.1% of retail electric sales, New Hampshire will:

- Keep $45 million in ratepayer's pockets.
- Create thousands of jobs.[6]
- Reduce costs for consumers, because the average lifetime cost of EE is 3.1 cents/kWh, less expensive than any supply-side resource.
- Leverage significant private capital from ratepayer and institutional contributions.

B. Near-term Goals for New Hampshire

Data on energy savings achievement and near-term goals from nearby jurisdictions are instructive in considering potential EERS goals for New Hampshire. In 2014, the average electric energy savings in Massachusetts, Rhode Island, Connecticut, and Vermont was 2.4% of sales. The average electric energy annual savings targets from 2016 through 2019 for those same states is 2.2% of sales. On the gas side, the average 2014 gas energy savings in Massachusetts, Rhode Island, and Connecticut was 1.0% of sales. The average gas energy savings targets from 2016 through 2019 for those same states is 0.9%. Based on these data and the discussion herein on best practices, the New Hampshire EERS should include the following target structure:

- A cumulative electric energy savings target of 3.1% of sales for the 2017-2019 period, with nominal interim annual targets of 0.8%, 1.0%, and 1.3% savings

[6] For example, see: http://ma-eeac.org/wordpress/wp-content/uploads/CI-Achieving-Greater-Savings-Earlier-in-the-Year.pdf.

[7] Vermont Energy Investment Corporation. November 2013. *Increasing Energy Efficiency in New Hampshire: Realizing Our Potential*. Prepared for the New Hampshire Office of Energy and Planning.

in each year. The cumulative target should be the focus; the annual targets are a suggested trajectory that utilities should aim to meet within plus-or-minus 25%. This is well below both recent actual achievement and near-term goals in most of New England but appropriate given the lower starting point of current program savings (approximately 0.7% annually).

- A cumulative gas energy savings target of 2.25% for the 2017-2019 period, with nominal interim annual targets of 0.7%, 0.75%, and 0.8% and the same treatment of annual targets. Again, this is below both recent actual achievement and near-term goals in most of New England.
- A longer-term goal of reaching annual electric savings of 2% annually and gas savings of 1% annually by 2021, with an ultimate goal of achieving all cost-effective energy efficiency over the long term.
- For electric utilities, a peak demand reduction target should also should be included, both because it is required by New Hampshire's 2015 HB 614, and to ensure that the benefits of peak reduction are realized for the benefit of all ratepayers. Peak demand growth drives electricity prices by creating the need for additional generation, transmission, and distribution capacity requirements and by driving up wholesale energy prices. This target should at minimum be set at the expected peak demand reduction from a comprehensive efficiency portfolio designed to reach the electric energy savings target, and higher if additional stand-alone peak demand reduction measures are cost-effective. Cost-effective peak shaving demand response programs should be considered toward setting and meeting an ambitious demand reduction target.

C. Additional Considerations

There are additional factors to consider in implementing savings targets. Most importantly, as described in a later section, the near-term targets should not be constrained by current funding levels. The proposed targets above represent a reasonable increase in funding and goals from current levels and represent highly achievable and cost-effective savings. The outcome will be substantial economic benefits to all New Hampshire ratepayers.

Determining how and what savings will be counted will help to inform the goal-setting process and identify the savings potential in New Hampshire. In addition to selecting the proper goal-setting time frame, it is important to decide at the beginning of the process what "counts" towards EERS savings targets and how those savings are assessed.

There are several factors and types of savings where the manner in which they are addressed and counted may affect the level of the goal. For example, the achievements and

goals in other New England states presented above are all reported as "net" savings.[8] If the New Hampshire EERS goals are instead framed as goals for gross savings, the recommended three-year targets above should be adjusted upward. This would also be true to some extent if savings from updated codes and standards will be counted and where compliance is attributed directly to action taken by the program administrator. Other areas of savings that are not currently included in the goals recommended above are savings from self-direct customers and savings from before-the-meter projects.[9] If New Hampshire utilities will be allowed to count those savings towards their targets, those targets should be higher than indicated above. On the other hand, with respect to before-the-meter savings, the argument can be made that where those investments are cost-effective, they should be made by the utility as part of its requirement to provide least-cost reliable service and included in distribution rates, rather than being funded by energy efficiency program budgets.

Finally, if savings from fuel-switching (including combined heat and power projects) are counted, agreement should be reached on how these savings are calculated. The best practice in this area is to calculate true net energy savings, factoring in increases and decreases for all fuels involved, and further addressing source fuel savings such as reduced generator gas consumption resulting from switching away from site electric use.

III: PROGRAM ADMINISTRATION

A variety of delivery models have been used to implement efficiency programs in other jurisdictions. Program administrators may include utilities, governmental organizations, independent third parties, or a combination of parties that split administrative and implementation efforts.[10] A report by Lawrence Berkeley National Laboratory report found that no administrative structure is inherently superior to another. And although various factors in a state, including the policy and regulatory environments, may affect how different models are best structured for any particular jurisdiction, the report suggests, "with the right incentives, oversight, and underlying efficiency procurement and resource acquisition policies both utility administration and third party administration have the ability to deliver nation-leading efficiency investments and program results."[11] Other important conditions for success that are

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[8] As applied to energy savings from efficiency programs, the term "net" accounts for two effects relative to measured, or "gross," savings: 1) subtracting "free rider" participants whose savings were counted in the program but who would have made the efficiency investment even in the absence of the program and 2) adding "spill over" participants who made efficiency investments but who did not participate in the program and were therefore not counted.

[9] Before-the-meter savings are those that are realized on the distribution or transmission system, in contrast to behind-the-meter savings which are realized at a customer facility and that therefore reduce energy sales as measured at the meter. Energy efficiency programs traditionally have focused almost exclusively on behind-the-meter savings.

[10] Sedano, Richard, Regulatory Assistance Project, "Who Should Deliver Ratepayer-Funded Energy Efficiency? A 2011 Update. November 2011. https://www4.eere.energy.gov/seeaction/system/files/documents/rap_sedano_whoshoulddeliverratepayerfundedee_2011__11_15.pdf.

[11] Ernest Orlando Lawrence Berkeley National Laboratory, "Who Should Administer Energy Efficiency Programs?" August 2003. https://emp.lbl.gov/sites/all/files/lbnl%20-%2053597.pdf.

not dependent on the choice of program administrator include clarity of the purpose for pursuing efficiency, consistency of policy over time, and consensus among stakeholders.[12] Utilities operating in New Hampshire have been able to achieve higher levels of savings in other jurisdictions. This is unlikely to be the result of differences in administrative structures, but rather from differences in the utility incentives and cost-recovery mechanisms in place to facilitate higher savings and the existence of clear efficiency goals such as through an EERS.

In New Hampshire and other states with multiple utilities, there are some clear benefits to state-wide delivery of some efficiency services, as demonstrated by the *NHSaves* branding for the four utilities' Core energy efficiency programming. Statewide implementation can provide consistency in program offerings and brand recognition as well as economies of scale in terms of marketing, vendor management, and other administrative needs. Although the current New Hampshire model of utility-administered programs is likely the most appropriate option in the near-term, the state should remain open to a third-party delivery model at some point in the future. Competitively bidding out the entire portfolio or individual pieces of efficiency acquisition may maximize private leverage and deliver savings in a manner that allows for all potential administrators, utilities and third-parties alike, to offer comprehensive, least-cost savings. This does not have to be an all-or-nothing proposal, either. Statewide utility implementation of some individual programs or services program can provide an initial test of this approach. Market transformation efforts are a particularly good candidate for initial statewide efforts, as product supply chains and customer purchasing behavior do not necessarily follow utility service territory boundaries, as New Hampshire learned with successful RGGI grants for delivery of targeted programs. At the smaller scale, specific programs or services could be put out to bid for delivery by a contractor, thus avoiding the need to gear up for a large statewide administrative effort.

IV: PROGRAM OVERSIGHT

Regardless of the program administrative model, many of the states that are successful in delivering energy efficiency share the characteristic of having an oversight body in addition to the regulatory entity or public utility commission.[13] These boards or councils have a variety of structures and operating parameters, but all provide strong oversight to the utilities' activities and have the authority and resources necessary to do so. This oversight is a critical component in the success of an EERS. Commission proceedings are generally too cumbersome to provide a forum where inclusive, informed discussions and decisions necessary to implement best practice energy efficiency programs can be held. New Hampshire's current Energy Efficiency and Sustainable Energy Board includes some features important to a robust advisory body (e.g., diverse membership), but because it currently has little authority and no staff or funding, it is not currently equipped to act as the EERS advisory body.

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[12] Sedano, *Ibid*.

[13] Environment Northeast, "Best Practices for Advancing State Energy Efficiency Programs: Policy Options & Suggestions." February 2012. http://acadiacenter.org/wp-content/uploads/2014/12/ENE_StatePolicyOptions_BestPracticesWhitepaper_February2012.pdf.

A. Authority and Accountability

An advisory body is typically accountable to and draws its authority from the entity that created it. In the case of a New Hampshire EERS, that would likely be the Commission, although it could also occur through enabling legislation. Regardless of how it is formed, the role of the oversight body is to ensure, as much as possible, that the conditions and requirements of the EERS are met while ensuring maximum stakeholder input and transparency. While the Commission retains ultimate authority to approve utility spending, rates, and cost recovery, in states with a strong oversight body there is also a presumption that activities approved by the oversight body will be approved by the Commissioners after its review.

The advantage of this structure is that the oversight body has far more time and resources available to work with the utilities and/or program administrators—and other stakeholders—than do the Commissioners or their Staff. This is particularly true if the body has sufficient funding and support, as described below.

B. Membership

Membership in an oversight body should include representatives of a wide range of stakeholders. Enabling legislation is often designed to ensure that council members bring a balance of interests to efficiency oversight.[14] Stakeholders should include all customer classes (individually represented), state energy and environmental policy staff, Commission staff, consumer protection agencies, advocacy groups in the energy and environmental fields, and the energy efficiency industry (both service providers and members of the efficient equipment supply chain). The utilities themselves should be active participants in the body but should not have voting privileges. The result should be an independent entity that can serve the goals of the EERS objectively.

C. Funding and Support

For the oversight body to be effective, it will need guidance from experts in energy efficiency planning, evaluation, program design, and implementation. In addition, because the members will likely have full-time jobs and only serve in a voluntary, unpaid capacity, support is needed simply to manage and conduct the basic operations and analysis of the group. This includes both administrative and technical support. The former is needed to ensure than the board or council has a place and schedule to meet, information technology resources, coordination of schedules, etc. In some jurisdictions (e.g., Connecticut), there is a contracted administrative position, while in others this role is served by Commission or state energy office staff. On the technical side, all successful oversight bodies have dedicated funding that the group uses to retain experts to address technical needs.[15] Potential sources of funding in New Hampshire are from the Evaluation, Measurement and Verification (EMV) set aside, general

[14] *Ibid.*

[15] *Ibid.*

efficiency program budgets, or other appropriations. Regardless of source, this funding should be secure and consistent throughout the EERS period to ensure high-quality results.

D. Activities

The activities of an oversight board are many and varied, but are all focused on ensuring successful achievement of the goals and objectives of the EERS and strong collaboration between stakeholders and program administrators. For example, the Connecticut Energy Efficiency Board is described as "a group of advisors who utilize their experience and expertise with energy issues to evaluate, advise, and assist the state's utility companies in developing and implementing comprehensive, cost-effective energy conservation and market transformation plans."[16]

V: FUNDING SOURCES AND AMOUNTS

"Buying" energy efficiency should be viewed akin to paying for any prudent acquisition of an energy resource. One advantage of paying for energy efficiency is that ratepayers pay for it once to save for a long period in the future, thus mitigating price volatility. Acquiring any new resource requires funding, with corresponding rate implications. There has been much discussion focused on limiting the rate impact of utility-delivered ratepayer-funded efficiency programs in New Hampshire by 1) keeping the current levels of Systems Benefits Charge (SBC) collections constant and 2) seeking private capital contributions.[17] That discussion is appropriate when undertaken in the larger context of comparative costs for all resource acquisition and their impacts on ratepayers, including the risk of stranded costs and other large fixed capital costs that must be amortized through rates over multiple years, if not decades. If only applied to efficiency but not to other resources, it is a distraction from a statutory and economic requirement to deliver just and reasonable rates, among other previously stated policy purposes. This section discusses several related aspects of these issues, specifically focusing on how New Hampshire can fund energy efficiency resources.

A. Funding Source is Not a Determinant of Rate Impacts

Commission staff has previously concluded that meeting higher efficiency targets solely with traditional ratepayer funding sources would result in higher rates.[18] This conclusion draws an inaccurate correlation between funding source and rate impact. The biggest driver of rate impacts from efficiency programs are not the recovery of program costs (i.e., administrative costs, contractor implementation costs, and customer incentive payments), but the result of fixed costs being collected over lower billing units. This latter effect is directly tied to the issue of lost revenue recovery, addressed in a separate section of this proposal. *These impacts will occur regardless of the source of program funding.* Moreover, these impacts do not represent increased societal or ratepayer costs, but rather a shift in the allocation and recovery of sunk fixed costs

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16 http://www.energizect.com/about/eeboard.

17 The charge for gas energy efficiency programs comes from a portion of the Local Distribution Adjustment Charge (LDAC).

18 Energy Efficiency Resource Standard: A Straw Proposal for New Hampshire. http://www.puc.nh.gov/Electric/EERS%20Straw%20Proposal.pdf.

among ratepayers. Despite these shifts, correcting the market failures in efficiency investments through the use of public funds results in a more rational and efficient allocation of resources and increases total net economic benefits for the state, *including lower customer bills overall*.

B. Private Funding is Not a Replacement for Public Funding

In the past, private funding for efficiency has largely been in the form of investments by Energy Services companies (ESCOs). These firms invest in energy efficiency and other improvements that reduce customer energy consumption in return for a share of the value of the realized energy savings. These arrangements have typically been limited to projects with very high return on investment, usually large projects with customers that consume a substantial amount of energy. Beyond this activity, there has been little investment in efficiency from the private sector in New Hampshire or elsewhere, beyond the significant customer investments required by programs as co-payment on efficiency measures. There may be several reasons for this, including uncertainty and lack of knowledge on the part of investors, concerns about quality control and workmanship, limited experience of local partners in dealing with the financial sector, split incentives among property owners and occupants, up-front investment barriers and private payback term expectations, and a relatively immature market for efficiency services in general. These and other barriers may best be addressed by focusing initially on ratepayer-funded energy efficiency to build knowledge, understanding, trust, and infrastructure that can later support more private funding.

Private funding for a broader set of efficiency customers and participants may best be leveraged through financing arrangements, where capital invested in a pool of efficiency projects generates a dependable return on investment. Here, a utility or third party program administrator plays an important role in both developing a pool of projects and by providing more traditional financial incentives to support the customer's investment. Studies of financing programs have concluded that combining financing with traditional rebates and incentives leverages deeper savings and broader participation.[19] That is, financing should serve as an adjunct to, not a substitute for, ratepayer-funded activities. Going a step further, other research has confirmed that integrating rebates and incentives into a financing program is an important strategy in helping residents defray project costs and overcome barriers to participation, and further recommends that the process of combining loan offerings with other rebates and incentives may be most smoothly handled by a single, hands-on program administrator that implements both the financing and other incentive.[20]

C. Funding Source is Not a Determinant of Funding Amounts

The amount of funding for efficiency programs, and the resulting savings targets, should therefore not be determined by the source or type of that funding. *Rather, efficiency investments should be pursued to the extent that they are cost-effective, meaning that the total economic benefits*

[19] Hayes, et al. 2011. *What Have We Learned from Energy Efficiency Financing Programs*? ACEEE Report U115. September.

[20] Kramer et al, 2013. *Residential Energy Efficiency Financing: Key Elements of Program Design*. Prepared for the Connecticut Fund for the Environment and ENE. January.

generated are greater than the costs. Limiting funding to a level that falls short of this point means that total ratepayer bills are more costly than could be. Put another way, funding limits well below what is cost-effective leaves ratepayer economic benefits "on the table" and results in an inefficient allocation of ratepayer dollars. While private funding and capital can play an important role in supporting rate-payer funded efficiency and contribute to robust and successful efficiency programs, these funds should not displace cost-effective and prudent ratepayer funding. It is also important to realize that there is already and will continue to be private investment as part of ratepayer funded efficiency programs, in the form of the customer contribution to each efficiency measure and project.

D. Funding Should Come from All Ratepayers

Regardless of how ratepayer funds are collected for future efficiency programs in New Hampshire, all customers should contribute because all customers benefit. Exemptions for a particular class of customers, including large energy consumers, are not good practice, either from a regulatory or program design perspective. While in some jurisdictions exempt consumers are encouraged or required to demonstrate that they are investing in energy efficiency in amounts similar to what they would contribute if they were not exempt, this fails to leverage customers' private investment as is required from smaller commercial and residential customers. That is, a small commercial customer is typically required to pay for some portion of an efficiency investment; the efficiency program incentive will not cover the total cost. Allowing exempt customers to simply spend the funds they would have remitted to the program, without additional contribution of their own, unfairly favors that rate class with 100 percent cost coverage for their projects.

However, recognizing the unique and immediate cost concerns of large users in New Hampshire, if large customers were to be exempt from paying into efficiency program funding, they should be required to demonstrate evaluated savings from investment in excess of what they would otherwise have contributed. As a potential starting point, the EERS could require exempt customers to match these contributions one-for-one; if they were going to pay $20,000 in efficiency fund contributions, they should demonstrate $40,000 in efficiency investments. Another option to address large users' interests is to require that all potentially exempt customers participate in the program initially, and earn an exemption only by demonstrating participation in and investment in efficiency programs over a short period, perhaps one or two years.

Additional concern over maximizing funding opportunities for cost-effective energy efficiency should prompt a review regarding the proceeds from the Regional Greenhouse Gas Initiative (RGGI) auctions. Rather than returning most of these proceeds to ratepayers as embedded credits in the customer tariff, all of them should contribute to the available funding for efficiency, which is currently derived from only a portion of RGGI auction proceeds in addition to the SBC and the LDAC. As detailed in a 2015 study conducted by The Analysis Group, ratepayers in the saved $460 million dollars from 2012 to 2014 by investing RGGI

proceeds largely in energy efficiency.[21] New Hampshire is foregoing lower bills and net benefits by not investing its full auction proceeds in energy efficiency.

VI: COST RECOVERY

Utilities typically point to three critical components of the economics of rate-payer funded energy efficiency programs: implementation costs, lost net revenue, and performance incentives.[22] Each of these categories of costs and spending should be addressed by a comprehensive EERS. Common to all of these is the need to determine both the amount of each category and a mechanism to collect the required amounts from ratepayers. The issue of collection mechanisms is addressed here; the sections below address the specifics of each category of cost and how the magnitude of these costs is determined.

Stakeholders involved in the technical sessions in this docket expressed a variety of opinions regarding how to structure cost recovery with respect to customer bills, acknowledging differences in how implementation costs are currently recovered across electric and gas utilities. At this time, the specifics of whether these amounts should be recovered in New Hampshire through a fuel adjustment rider, local delivery access/adjustment charge, SBC line-item, or other component of the bill are under discussion. Some general recommendations on the topic include the following:

- None of these cost components should be included in base rates. The concept of performance incentives, described below, is to provide a return on investment from energy efficiency comparable to the return from supply-side investments (factoring in differences in risk level and recovery period), but in a manner that protects the ratepayers and ensures that the spending is generating benefits, not just profits.
- While including these costs in base rates is not appropriate, it may be acceptable to amortize program implementation costs over a short period of time to better match these costs with the benefits they generate over the lifetime of the savings produced by the program. If this approach is adopted, the Commission should consider compensating the utility for carrying costs at the actual debt costs for short-term, relatively risk free investment, rather than simply using the utility's weighted average cost of capital (WACC). The latter includes the costs of longer-term, riskier borrowing that is not applicable to the amortization of efficiency program costs.

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[21] The Analysis Group. *The Economic Impacts of RGGI on Nine Northeast and Mid-Atlantic States.* July 2015. http://www.analysisgroup.com/uploadedfiles/content/insights/publishing/analysis_group_rggi_report_july_2015.pdf.

[22] For example, see *Aligning Utility Incentives with Investment in Energy Efficiency,* Environmental Protection Agency. November 2007. http://www2.epa.gov/sites/production/files/2015-08/documents/incentives.pdf.

A. Program Implementation Cost Recovery

Few will argue that utilities or program administrators who deliver energy efficiency programs should not be able to recover the costs of those programs in a fair and reasonable way. Beyond this basic concept there are several details, and these may be addressed either in an EERS or directly by a regulatory body in relevant individual utility proceedings. The items below reflect several principles that the Commission should consider in addressing program cost recovery.

Utilities or program administrators should be able to collect 100% of actual efficiency program costs prudently expended, with appropriate interest related to any delays or variances in timing of collections. As with all ratepayer expenditures, the Commission should have the authority to disallow any expenses deemed imprudent. However, it is important to ensure that evaluation results related to the cost-effectiveness of programs or other measures of program performance (e.g., net-to-gross ratios) are not used to deny cost-recovery of programs delivered according to agreed upon planning assumptions. For example, if programs are approved based on an *ex ante* assessment of cost-effectiveness, an *ex post* finding that program costs outweighed benefits (for any number of reasons, including those outside the control of the utility) should not by itself be reason to consider those programs imprudent.

As much as is practically feasible, each customer class (residential, commercial, and industrial) should contribute to program costs in proportion to spending on programs for those customer classes. Linking cost recovery to program expenditures rather than customer class sales or revenue allows for an efficiency portfolio that takes best advantage of differences in the cost-effectiveness and size of the efficiency resource across customer-classes. It also eliminates cross-subsidization across classes. The one exception to this is that, as New Hampshire has done since the inception of its programs, low-income program budgets are allocated first, with the remaining budgets allocated proportional to remaining customers. This should continue.

Even if programs are expensed and recovered each year, there must be a mechanism for annual true-up of any over- or under- collections. Short term risk-free interest costs or credits should be applied to any true-ups.

B. Lost Net Revenue Recovery

The second area of utility economics related to efficiency programs is lost net revenue. In addition to the direct cost of implementing programs, utilities experience a reduction in revenue as efficiency programs reduce energy sales. This results in "lost" revenue for the portion of the utility's fixed costs that were not avoided by reducing energy consumption. The Commission set rates such that these fixed costs would be recovered over many years of sales; when sales volume is lower than projected as a result of efficiency efforts, the fixed costs are not recovered in full. The term lost net revenue is typically used to denote that the lost revenue is net of the reduced variable costs; it can also be called lost fixed revenue. Note that the need to compensate the utility for this lost revenue is *not* an additional cost of efficiency programs. By their very nature, lost revenues are those that would have been collected from the customers *even in the absence of efficiency programs*. Addressing lost revenue from efficiency is simply a shift in how

those revenues are recovered from ratepayers. This may be accomplished by increasing the volumetric charge so that fixed revenues are fully recovered, which is akin to, but much simpler than, a rate case. While lost revenue could also be addressed by increasing fixed charges on the bill, this is not a recommended solution because it has other negative effects.

The link between sales and revenue creates a financial incentive for utilities to increase, rather than decrease, sales. This "throughput incentive" is often at odds with the goals of efficiency programs. There are two primary mechanisms that have been implemented to address lost net revenue and the throughput incentive. Lost revenue recovery mechanisms are designed to quantify the lost net revenue as a cost that can be recovered by the utility, while decoupling seeks to remove the direct connection between sales and revenue, such that the utility's fixed costs are covered regardless of total energy sales. As noted above, the costs recovered by a utility under either of these approaches should not be viewed as additional costs of efficiency programs. Rather, they result in an explicit allocation of existing costs to these mechanisms, costs that were previously borne by ratepayers in general in the fixed cost recovery portion of their bill.

Last, when utilities are provided with reliable lost revenue recovery that removes the disincentive to reducing sales, the discussion and negotiation of performance incentives, as addressed in the next topic heading, can be focused solely on incentives for exemplary performance, rather than as a means to compensate for un-recovered lost revenue.

B.1 Lost Revenue Adjustment Mechanisms

A Lost Revenue Adjustment Mechanism (LRAM) determines how much of a utility's revenues are lost due to the implementation of energy efficiency programs and allows recovery through a rate adjustment. It does not account for the effects of exogenous variables on electric sales, nor does it rely on actual sales data, but rather is based on calculations of the energy reductions resulting from program activity. Therefore, precise evaluation, measurement, and valuation (EM&V) is required to develop accurate estimates of lost revenue; this can be a contentious process.[23] It can also increase evaluation costs or shift more evaluation funds to retrospective analysis of savings claims rather than forward-looking analyses.

Best practices in LRAM include the following:[24]

- Rigorous, transparent evaluation with appropriate checks and balances, including independent third-party review;
- Frequent rate cases to avoid the "pancake effect" of lost revenue recovery costs accumulating over many years without resetting base rates to account for cumulative efficiency savings; and

[23] Lazar, J. *The Basics of Decoupling: A Superior Solution to the Throughput Incentive.* Presentation to the New Hampshire Energy Efficiency and Sustainable Energy Board. June 19, 2015. http://www.raponline.org/document/download/id/7669.

[24] Gilleo, et al. 2015. *Valuing Efficiency; A Review of Lost Revenue Adjustment Mechanisms.* ACEEE Report U1503. June. http://aceee.org/sites/default/files/publications/researchreports/u1503.pdf.

- Combining LRAM with appropriate cost recovery and performance incentives (as discussed elsewhere in this document), because LRAM is generally not sufficient to promote increased utility investment in energy efficiency.

Because it does not remove the direct link between sales and revenues, an LRAM will allow a utility's earnings to increase or decrease as a result in changes in sales resulting from variation in weather, greater than expected economic growth, and other exogenous factors other than energy efficiency. As a result, utilities are still incentivized to increase, not decrease, sales. One potential side effect is the creation of a bias in favor of utility-funded efficiency programs (which create lost revenue recovery) to the exclusion of codes, standards, and other potentially lower-cost means to achieve savings that do not generate lost revenue recovery.[25]

A related effect is that it is possible for a utility to have sales in excess of the test year used to set rates even with reductions from efficiency programs, for example as a result of extreme weather. In this case, the utility would earn excess profit AND collect lost revenue. On the other hand, an LRAM does not correct for under-recovery of fixed costs beyond the amount attributable to efficiency programs. These effects are eliminated in decoupled ratemaking, described below.

B.2 Decoupling

Decoupling is a tool intended to break the link between how much energy a utility delivers and the revenues it collects. While it is most often considered in the context of introducing or expanding energy efficiency efforts, it has appeal on economic efficiency grounds even in the absence of energy efficiency programs.[26]

Although decoupling appears in various forms and by different names, it generally includes a price adjustment to "true up" revenues when sales are different than those forecasted in the rate-setting process.[27] This correction of variances should take place at least annually and should accrue to the utility, or credit back to ratepayers, with interest at an appropriate low risk, short-term interest rate.

Any decoupling mechanisms should fully decouple throughput from revenue, and not be applicable solely to adjustments for efficiency impacts separate from other load variances. Decoupling that accounts for sales fluctuations beyond efficiency will reduce risk to shareholders as well as limit upside potential returns. This may translate into benefits for consumers in cases where sales increase unexpectedly from weather, economic growth, or increased consumption from new technologies (e.g., electric vehicles).

Full decoupling is preferable to an efficiency-specific LRAM for several reasons:

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[25] National Action Plan for Energy Efficiency, prepared by Val R. Jensen, ICF International, "Aligning Utility Incentives with Investment in Energy Efficiency, 2007. http://www2.epa.gov/sites/production/files/2015-08/documents/incentives.pdf.

[26] Regulatory Assistance Project, June 2011. *Revenue Regulation and Decoupling: A Guide to Theory and Application*.

[27] Environmental Protection Agency. 2007. National Action Plan for Energy Efficiency.

- Symmetrical treatment of changes in cost recovery, resulting in the potential for both customer surcharges and refunds, rather than just surcharges
- Completely removes incentive to increase sales for reasons not directly related to efficiency
- Removes the potential for unnecessary or contentious litigation around evaluation
- May simplify future rate cases
- Reduces volatility in utility revenues

The Commission should strongly consider moving towards full decoupling in New Hampshire, even if LRAM is used as an interim step, given the timeline needed to pursue full and well-designed decoupling.

C. Performance Incentives

Although recovery of both program costs and lost revenues removes much of the disincentive for utilities to invest in efficiency programs, it does not provide an incentive to strive for additional savings. Because utilities can earn a rate of return on supply side and before-the-meter investments, meeting demand through traditional supply is usually a more desirable option. Performance incentives are designed to encourage utilities to invest in efficiency by making the returns comparable to supply side investments. These incentives are provided in addition to program cost and lost revenue recovery; they should not be used as proxies for either. As with program cost recovery, there are multiple models that states have used to successfully structure efficiency program performance incentives. The three most common performance incentive designs include performance target incentives, shared savings incentives, and rate of return incentives.[28]

- *Performance target incentives* have been used in states like Rhode Island and Massachusetts. They provide utilities with a predetermined dollar incentive for reaching savings and other targets, typically derived as a percentage of program costs or net benefits. Often, the percentage amount increases if the utility meets a threshold, achieves the target, or exceeds the target. In some cases, utilities may also be charged a penalty for not achieving targets. New Hampshire already has this type of incentive in place.
- Under *a shared savings incentive* design, the utility and ratepayers share a portion of net benefits or program budget for reaching efficiency targets. This creates a need to develop estimates of net benefits that fairly represent tangible benefits to consumers and ratepayers, as well as clarity in how those estimates will be generated.

[28] ACEEE, "Incentivizing Utility-Led Efficiency Programs: Performance Incentives." Accessed November 13, 2015. http://aceee.org/sector/state-policy/toolkit/utility-programs/performance-incentives.

- Last, *rate-of-return incentives* allow utilities to earn a return on efficiency investments that is equal to or greater than the rate of return for supply side investments. One potential drawback to this approach is that because the risk associated with investments in energy efficiency is typically lower than the risks of capital investments (e.g., generation facilities, transmission and distribution infrastructure), providing an equal rate of return on demand-side investments may overcompensate the utility.

Although performance incentive models vary by jurisdiction, there are several elements that should be considered regardless of the specific incentive mechanism. Earnings and/or penalties in any incentive mechanism should be clearly articulated and based on tangible, measurable performance that is under some control of the utility or program administrator. Performance incentive metrics should also be defined in a way that achieves efficiency policy objectives and guards against perverse incentives. For example, mechanisms should not tie earnings or penalties directly to program expenditure, nor simply to performing specific activities. These performance indicators would not necessarily encourage utilities or program administrators to keep costs low and continually improve program delivery. Rather, performance metrics should be based on program or portfolio performance to ensure efficiency programs achieve desired levels of savings and benefits.

Multivariate designs, whereby multiple parameters can be rewarded or penalized, are one way to protect against perverse incentives that could lead to undesirable policy outcomes. For example, the performance incentives included in the 2013-2015 Massachusetts Energy Efficiency Plan were composed of both savings and value components.[29] The savings component encouraged maximum total benefits while the value component encouraged maximum net benefits and cost-effectiveness. A multi-variate performance incentive could even make use of more than one of the three major types of incentives described above. Last, multiple performance incentive metrics can support additional desirable policy outcomes not directly tied to energy savings, such as job creation, customer satisfaction, and market transformation.

Another important consideration is performance incentive earning potential. Earnings targets should be sufficient to provide utilities with a reasonable incentive to pursue exemplary performance and to put investment in efficiency on an equal footing with other earnings opportunities. On the other hand, the incentive mechanism should ensure that ratepayers are protected from providing excessive earnings levels beyond those necessary to provide an adequate incentive to place efficiency on an equal footing with supply-side investments. Incentives should also be commensurate with the lower risk of investing in efficiency as compared to supply-side investments.

Performance rewards and penalties should be scalable and allow for a range of continuous outcomes over some reasonable range of performance targets, as opposed to being only a "win it or lose it" design. This structure rewards utilities for working towards and achieving targets while providing additional incentive to strive for even higher levels of savings.

[29] Nowak, Seth, et al., ACEEE, "Beyond Carrots for Utilities: A National Review of Performance Incentives for Energy Efficiency." May 2015 http://aceee.org/sites/default/files/publications/researchreports/u1504.pdf.

VII: EVALUATION, MEASUREMENT & VERIFICATION

The topic of how to measure energy efficiency program results has appeared throughout the preceding discussion. Ultimately, the success of an EERS can only be measured by assessing the extent to which energy reduction targets were actually realized. This measurement is often referred to as evaluation, measurement, and verification (EM&V, or sometimes simply "evaluation"). While EM&V is a broad, complicated topic that has been the subject of substantial scholarship, the key concepts and requirements relevant to this proceeding can be summarized in a few points.

- EM&V should be guided by clear requirements for rigor, transparency, and independent third-party verification, to ensure consistent and fair assessment of program performance. Without such requirements, the results of EM&V efforts may be contested as to their accuracy and validity.
- Transparency demands that EM&V be conducted by an independent entity other than the utilities or program administrators that implement programs and/or who therefore have a vested interest in the results.
- The achievement of savings targets and the earning of performance incentives should be evaluated on the same basis. This is both an efficient use of evaluation resources and fair to all parties, including ratepayers and utilities.
- Assuming that independent third-party EM&V is conducted on behalf of the Commission and/or an efficiency oversight board, the Commission or oversight board not only must be well-informed on EM&V best practices but will also need resources in terms of managing the evaluation contractor, directing the work, and interpreting the results.

Several documents exist that describe EM&V best practices in detail. One of the most comprehensive is the *Energy Efficiency Program Impact Evaluation Guide* published by SEE Action.[30] Another important resource for New Hampshire is the Regional Evaluation, Measurement and Verification Forum facilitated by the Northeast Energy Efficiency Partnerships.[31]

VIII: CONCLUSION

This document presents a range of recommendations regarding the structure and details of an energy efficiency resource standard in New Hampshire. These recommendations are drawn from and based on published literature and research, the experience of other jurisdictions with energy efficiency programs and policies, and economic and public policy theory. While it is not

[30] State and Local Energy Efficiency Action Network. 2012. *Energy Efficiency Program Impact Evaluation Guide*. Prepared by Steven R. Schiller, Schiller Consulting, Inc., www.seeaction.energy.gov. https://www4.eere.energy.gov/seeaction/system/files/documents/emv_ee_program_impact_guide_0.pdf

[31] http://www.neep.org/initiatives/emv-forum/regional-national-emv.

necessary that every one of these recommendations be followed for there to be a fair and successful EERS in New Hampshire, they do represent a consistent and congruent set of approaches and policies that seek to balance the interests of all stakeholders, and therefore should be approached as holistically as possible.